

HIMACHAL PRADESH ELECTRICITY REGULATORY COMMISSION, SHIMLA

Suo-Moto Petition No.: 79/2020

CORAM

Sh. Devendra Kumar Sharma
Chairman

Sh. Bhanu Pratap Singh
Member

(Date of Order: 15.01.2021)

IN THE MATTER OF:-

Determination of Generic Levellised Tariffs for Solar PV Projects for FY 2020-21 under Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2017.

ORDER

1. The Commission notified the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2017 in the Rajpatra, Himachal Pradesh on 23rd November, 2017 and also made amendments from time to time. In the 4th amendment of the said Regulations, as carried out on 8th September, 2020 and notified in the Rajpatra, Himachal Pradesh on 15th September, 2020, the financial principles for the various RE technologies, including solar PV projects, in respect of the 3rd control period (i.e. 01.04.2020 to 30.09.2023) have been specified. The said Regulations of 23rd November, 2017, read with subsequent amendments as aforesaid, have hereinafter jointly referred to as “RE Tariff Regulations, 2017”.
2. The Commission, in due discharge of the mandate under regulation 18 of RE Tariff Regulations, 2017 has issued the proposal dated 13.11.2020 for categorization of solar PV projects, fixing the technology specific parameters and determination of the Generic Levellised Tariffs of Solar PV projects (not exceeding 5.00 MW), alongwith associated terms and conditions, for FY 2020-21.

3. The Commission invited objections/suggestions from public on its aforesaid proposal, by way of insertions in two News Papers i.e. “The Tribune” and “Daink Bhaskar” on 21st November, 2020. The text of said proposal was also made available on the Commission’s website www.hperc.org.
4. The Commission, vide letter dated 21.11.2020, also requested the major stakeholders, including the State Government, Directorate of Energy, HIMURJA, HPPCL, the Distribution Licensee i.e. HPSEBL, the Consumer representative and the Industries associations etc. to send their objections/suggestions as per the aforesaid public notice.
5. In response, the written comments/suggestions were received from the following stakeholders:-
 - (i) The Himachal Pradesh Power Corporation Ltd. (HPPCL), Himfed Building, BCS, New Shimla-171009(HP).
 - (ii) M/s R.P. Suman & Co., VPO Jahu, Tehsil Bhoranj, Distt Hamirpur-176048 (HP).
 - (iii) The Consumer Representative.
6. As per the aforesaid public notice, the public hearing, in online mode, was held on 21st December, 2020. The list of stakeholders who participated in the hearing is annexed at **Annexure-“A”**. During the course of public hearing, the following views were expressed:-
 - (a) The representative of M/s R.P. Suman & Co. reiterated his written submission relating to treatment of GST for solar PV power plant and suggested that the Commission may consider additional provision for the GST component in capital cost of the projects.
 - (b) The representative of the HPSEBL stated that the distribution licensee has no comments to offer in the matter.
 - (c) The Special Secretary (MPP & Power) to the Government of Himachal Pradesh, endorsed the views of the HPSEBL.

7. We now proceed further to consider the suggestions made by the stakeholders in their written submissions as well as in the oral submissions made during the public hearing.-

(A) **CAPITAL COST.-**

- (i) Himachal Pradesh Power Corporation Ltd. has submitted that the Capital Cost proposed in the determination of Generic Levellised Tariffs for Solar PV Projects for FY 2020-21 is even lesser than the same considered in the orders for determination of Generic Levellised Tariffs for solar PV Projects for the previous years. It has also been stated that as per the consent and Power Purchase Agreement with HPSEBL, the HPPCL had floated tender for design, supply, construction & erection, testing commissioning and operation & maintenance for 5(five) years of 5.00 MW solar power projects at Berra Dol, Teh. Sh. Naina Devi Ji, Bilaspur, HP and that the L-1 bid finalized for the tender amounts to Rs. 28.34 Cr. (excluding land cost, Evacuation cost up to interconnection point cost, Preliminary and pre-operative expenses). The project cost based on this bid has been worked out as Rs. 622.962 per MW. HPPCL has suggested that the Capital Cost proposed should be higher so that the solar power stakeholders can be attracted for investing in solar generation in the State.
- (ii) M/s R.P. Suman & Co. have submitted that the proposed per MW capital cost of Rs. 379 Lakhs for the project upto 1.00 MW is too low. It has been stated that presently the actual per MW cost varies from Rs. 400 Lakhs to Rs. 420 Lakhs. It has further been submitted that since individual will not get input credit, the cost should be escalated by 18% to provide for the impact of the GST. It has also been suggested that 5% contingences expenses to be considered in the capital cost. It has also been mentioned that the cost of modules considered by the Commission is also on lower side as the Module manufactures are charging Rs. 175 Lakhs per MW.
- (iii) The Consumer Representative has submitted that the capital cost taken for Solar PV Module at Rs 144.17 lakh/ MW is a bit on higher side whereas the

same are available as low as 125 lakh per MW as on date. It has been suggested that the Commission may consider reducing the Capital cost accordingly.

Commission's View:-

- (i) We feel that since the price of solar PV modules in International market is following a declining trend, the per MW Capital Cost has to be lower than what was considered in the tariff order(s) for the previous year(s). As regards the rate quoted under L-1 bid of HPPCL, we feel that the same is not relevant in the present time frame. This can by no means be taken as bench-mark of deciding the Capital Cost to be allowed for the purposes of this Order.
- (ii) We observe that the normative capital cost, as proposed already includes the impact of various taxes and as such the same is not required to be considered separately. We also observe that most of the supplies relating to solar PV projects may normally attract GST upto 5% only and higher rates of GST may be applicable only for the service portion which in any case may not exceed 30% of the cost of the related components. Moreover, the cost of land etc. may not attract GST. Similarly, the proposed cost already accounts for the contingencies and do not require any separate consideration. In view of above and also keeping in view the comments of the consumer representative, we decline to accept the plea for upward revision of the proposed cost which already takes into account the various related factors.
- (iii) The market price of the solar panel has been duly considered while proposing the normative cost. As such we decline to make any further reduction in the capital cost, as proposed by the Consumer Representative.

(B) Normative Net Saleable Energy.-

- (i) M/s R.P. Suman & Co. have submitted that in order to achieve 21% CUF, as proposed by the Commission, the DC capacity has to be increased by 25% which will result in an increase in the capital cost. A similar view was also expressed by their representative during the public hearing.

- (ii) The Consumer Representative has submitted that Solar panels with efficiency as high as 23% are also available in market. It has been suggested that the Commission may consider the higher CUF of 23% instead of 21% proposed.

Commission's View:-

- (i) The Commission has considered normative CUF as 21% in-line with the norms fixed by the Central Commission in their RE Tariff Regulations, 2020. The auxiliary consumption of 0.75% has been considered as a separate component as per the CERC norms, which was otherwise not considered in the previous solar tariff order where CUF was considered as 19% without any separate provision for the auxiliary consumption. Since with the technological developments the solar modules, are now capable of achieving higher efficiency levels, we feel that the proposed CUF is quite reasonable. We also decline to accept the plea made by stakeholder for the additional cost in this regard.
- (ii) As regards the suggestion made by the consumer representative to increase the CUF 23%, we feel that it may be little premature to consider further increase in the CUF in present time frame for the purpose of normative generic tariffs. In this connection, we also observe as per the CERC Regulations the normative CUF has been specified as 21%.

(C). Interest Rate.-

M/s R.P. Suman & Co. have submitted that at present, the banks do not provide the term loan at interest rate of 9.99%. It has been mentioned that the IREDA also provides term loan @ 11% and also that all the banks are demanding 100% collateral and BG for the total Project cost. It has been mentioned that these factors not only affect the viability of the project but also increase the capital cost. It has been suggested that rate of interest on loan should be considered @ 11-12% and the Generic Levellised Tariff should be in the range of Rs. 3.85 to Rs. 3.98 per kWh. Similar view was also expressed by their representative during the public hearing.

Commission's View:-

For the purpose of determination of generic levelled tariff under the RE Tariff Regulations, 2017, the interest rate has to be computed as per the provision of the regulations. Moreover, the provisions of the said regulations are in line with the CERC Regulations. As such the suggestions for adopting a higher interest rate does not merit consideration in this order. As regards the issues concerning securitization of the term loan, the same do not form a subject matter of the proposal under consideration.

(D). Useful Life of the project.-

The Consumer Representative has submitted that the life of a Solar panel is about 25 to 30 years and has suggested that the Commission may consider the useful life for Solar plants up to 30 years.

Commission's View:-

The useful life of solar PV projects has already been specified as 25 years in the RE Tariff Regulations, 2017 which is also in line with the CERC Regulations. As such the suggestion to increase the same does not merit consideration in this Order.

(E). General Comments.-

Following suggestions of general nature have also made by the consumer representative:-

- a. In a recent auction conducted by the Solar Energy Corporation of India (SECI on 21/12/2020), all time low price of Rs 2.00 per unit have been received for total 600 MW capacity, a significant drop in the prices of Solar Power from Rs 2.36 per unit in earlier auction conducted by them for 2GW of Power in [July 2020](#). Even the State run Power Giant NTPC have also quoted Rs 2.01 per unit for 600 MW of capacity.
- b. The Distribution Licensee is already surplus in power and does not require additional commitments through Solar purchase. They should meet their additional power commitments, if any through auction/ bidding route.

Instead of encouraging Distribution Licensee to purchase solar power from the local IPPs, Distribution Licensee should source their solar power from the SECI to meet their Solar Power Purchase Obligations.

- c. The proposed tariff is Rs 3.41 per unit for Solar projects up to 1 MW and Rs 3.37 per unit for projects above 1 MW to 5 MW in areas other than Industrial and Urban areas which are on the higher side. It has been mentioned that in recent auction rates available for SECI, the all-time low rates of Rs 2.00 per unit have been achieved and that the Commission may consider revising the relevant parameters for lowering down the per unit rates in order to limit the power purchase cost of the Distribution Licensee and ultimately the reduction in tariff for general Consumers.

Commission's View:-

- (a) The generic levellised tariffs being determined in this order only for procurement of power by the Discom from solar PV projects with capacity not exceeding 5.00 MW. We feel that it may not be a fair proposition to draw any direct inference from the bids received for the projects having Mega capacities.
- (b) The generic levellised tariffs being determined in this order only for procurement of power by the Discom from solar PV projects with capacity not exceeding 5.00 MW. Moreover, the proposal already provides that for higher capacities, the Distribution Licensee shall preferably purchase solar power through Solar Energy Corporation of India or else through the competitive bidding route.
- (c) In view of the discussion under sub-paras (a) and (b) above and also various other paragraphs of this Order we feel that the proposed parameters are quite fair and reasonable for the purpose of the determining the generic levellised tariffs for the solar PV projects not exceeding 5.00 MW capacities. As such, we decline to accept the suggestion given by consumer representative in this regard for revision of the parameters.

8. No comments/suggestions on other parameters, except as discussed above, have been received.
9. After having addressed the comments/suggestions of the stakeholders, we now proceed further to categorize the solar PV plants, fix the technology specific norms for the financial year 2020-2021 and also to determine the generic levelled tariffs for procurement of power by the distribution licensee from solar PV plants, as detailed in the succeeding paragraphs.

10. Categorization.-

The 2nd proviso of sub-regulation (2) of regulation 18 of RE Tariff Regulations, 2017 provides that the Commission may, by order, categorize the renewable energy technologies other than SHPs based on capacity of the projects, the available subsidy scheme and such other factors as may be considered appropriate by it. The Commission, after taking into account various factors like geographical and topographical conditions in the State and in order to promote smaller capacities of solar PV plants at different locations across the State, categorized solar PV projects vide its previous orders of solar PV tariff determination. We decide to retain similar categorization, as mentioned in the table below, for the solar PV generation capacity for the purposes of normative capital cost and determination of levelled tariffs for FY 2020-21:-

Category	Capacity of Solar PV Project at one site
I	Upto 1 MW capacity
II	Above 1 MW to 5 MW capacity
III	Above 5 MW capacity

The capacity in the second category has been limited to 5.00 MW. All the solar PV projects with a capacity of more than 5.00 MW shall accordingly fall under the third category. We expect that for higher capacities, the Distribution Licensee shall preferably purchase solar power through Solar Energy Corporation of India or else through the competitive bidding route. As such the generic levelled tariffs are being determined only for such solar PV projects where the capacities does not exceed 5.00 MW.

11. **Technology Specific Parameters.-**

The sub-regulation (2) of regulation 18 of the RE Tariff Regulations, 2017 provides that the Commission may, in order to promote such technologies for smaller capacities, follow, mutatis mutandis, upto the limits as it may consider necessary separately for each such technology but not exceeding 5.00 MW for any such technology, the technological specific parameters, including capital cost, and other terms and conditions, or the tariff as specified or adopted by the Central Commission for determining project specific tariff for any project(s) or generic levelled tariff for any category of project(s); or the inputs available from any other sources, as the Commission may find appropriate.

The Central Commission has notified Renewable Energy Regulations, 2020 i.e. Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2020 (hereinafter referred as “CERC RE Tariff Regulations, 2020”) vide which the normative. Capacity Utilization Factor (CUF) for solar PV projects has been specified as 21%. As regards the capital cost and O&M expenses, the CERC RE Tariff Regulations, 2020 provides that for these parameters, only project specific parameter(s), based on prevailing market trends, shall be taken into consideration. Thus the CERC has neither specified any benchmark for determination of normative capital cost for the solar PV projects nor envisage determination of generic levelled tariffs for such projects in their RE Tariff Regulations, 2020. Accordingly, the Commission decides to evolve its own technology specific parameters after taking into account the various available inputs, including those notified by the CERC and considered by the HPERC in its previous solar PV tariff determination orders.

11.1 **CAPITAL COST.-**

As per the website reports of pvinsights.com, the latest solar PV Module Weekly Spot Price accessed on 21.10.2020 as under:-

USD/Watt			
Item	High	Low	Average
Poly Solar Module	0.280	0.160	0.173
Thin Film Solar Module	0.310	0.200	0.213

We finalise the cost of Solar PV Module as Rs. 144.17 Lakhs/ MW considering the exchange rate of Rs. 74.70/USD based on the average of six months, i.e. 29th April, 2020 to 21st October, 2020 and module cost of 0.193 USD/Watt. We decide to adopt an all inclusive solar PV module rate of Rs. 157.15 Lakhs/MW after escalating the above rate by about 9% to cover various miscellaneous costs including degradation of cells and taxes etc.

After taking into account the State specific features, we fix the normative capital cost for the solar PV projects for category-II (above 1 MW to 5 MW capacity) as under:-

Sr. No.	Particulars	Capital Cost norm (Rs. Lakh/MW)
1	PV Modules	157.15
2	Preliminary and Pre-operative expenses, Land Cost, Civil & General Works and Mounting Structures	132.30
3	Power Conditioning Units	31.50
4	Evacuation cost upto interconnection point	52.50
	Total Capital Cost	373.45

The normative capital cost for the solar PV projects falling in category-I (upto 1.00 MW capacity) is being fixed by allowing an increase of about 1.5% on the normative cost for the category-II projects (above 1.00 MW and upto 5.00 MW capacity). Accordingly, the normative capital cost for the category-I (upto 1.00 MW capacity) solar PV projects is hereby fixed as Rs. 379.05 Lakhs per MW.

In line with the solar PV tariffs determined for previous years and the proposal made in the RE Tariff Regulations, 2017 for the current year, we also decide to allow marginally higher capital cost in respect of Solar PV project(s) to be set up in Urban areas and Industrial areas notified by the State Government so as to encourage installation of such plant in such areas, keeping in view the fact that location of plants in such areas may generally help the distribution licensee to utilize the power from such plant in more optimum manner. We decided to allow such additional capital cost for these area specific solar PV project(s) at the rate of Rs. 10.00 Lakhs per MW for category-II projects over

and above the normative capital cost considered for the project(s) to be set up in the areas other than Urban and Industrial areas. This additional cost of Rs. 10.00 Lakhs per MW shall however be further increased by 1.5% for plants upto 1.00 MW located in the urban areas and industrial areas.

Explanation;-

For the purpose of this tariff order-

- (a) The “Urban Areas” mean the areas covered under a Municipal Corporation, Municipal Council or a Nagar Panchayat set up by the State Government under any law enacted by the State Legislative Assembly and shall also include the area falling under the Cantonment Board constituted by the Central Government under the Cantonment Act, 2006.
- (b) The “Industrial areas” mean the areas notified as such by the State Government through its Industries Department or through any such other department/agency authorized by it.
- (c) For this purpose, a solar PV project shall be considered to be situated in the urban area or industrial area, as the case may be, if any one or both of the main components of the project i.e. the generating plant and the interconnection point fall in any such area(s) on the date of filing the petition for approval of PPA.

Accordingly, the Normative Capital Costs for respective categories of Solar PV plants are tabulated as under:-

Sr. No.	Category	Capital Cost norm (Rs. Lakhs/MW)
1	Projects to be set up in areas other than urban areas and industrial areas	
(a)	Upto 1.00 MW capacity	379.05
(b)	Above 1.00 MW to 5.00 MW capacity	373.45
2	Projects to be set up in urban areas and industrial areas	
(a)	Upto 1.00 MW capacity	389.20
(b)	Above 1.00 MW to 5.00 MW capacity	383.45

11.2 OPERATION AND MAINTENANCE EXPENSES.-

The Commission in its solar PV tariff order dated 20.01.2020 considered the normative O&M expenses as Rs. 8.27 Lakhs/MW with escalation @ 5.72%.

The normative O&M expenses for FY 2020-21 are hereby fixed as Rs. 8.74 Lakh/MW. These normative O&M charges shall also be escalated @ 3.84% per annum over the tariff period as per the RE Tariff Regulations, 2017.

11.3 **NORMATIVE NET SALEABLE ENERGY.-**

The CERC RE Tariff Regulations, 2020 provide that the annual normative Capacity Utilization Factor (CUF) of solar PV plant shall be 21%. We decide to adopt this norm. The deduction on account of auxiliary consumption, transformation losses and the project line losses shall be made at a composite rate of 1.45% of the gross generation worked out on the basis of the normative CUF of 21% to cover the auxiliary consumption, transformation losses and project line losses upto interconnection point on normative basis.

11.4 The other technology specific parameters viz. useful life of the project and tariff period, have already been specified in the RE Tariff Regulations, 2017, which are otherwise in line with the CERC Regulations also and the same shall be followed accordingly.

12. After having fixed the technology specific parameters as above, we now proceed to determine the generic levellised tariffs, based on the provisions of RE Tariff Regulations, 2017 (i.e. 01.04.2020 to 30.09.2023) for solar PV projects for FY 2020-21 under regulation 18 of the RE Tariff Regulations, 2017. The main details of the same are as follows:-

12.1 **Tariff Structure.-**

Regulation 12 of the RE Tariff Regulations, 2017 stipulates that single part levellised tariff structure, comprising of the following fixed cost components shall be followed and that in case, where, no fuel cost component is involved in power generation, the following parameters shall be considered:-

- (a) Return on Equity;
- (b) Interest on loan capital;
- (c) Depreciation;
- (d) Interest on working capital.

Accordingly, single part generic levellised tariffs have been worked out for the respective categories of solar PV projects by adopting the methodology, discussed in succeeding paragraphs.

12.2 Technological Specific Parameters.-

The normative parameters for capital cost, O&M charges and CUF etc. as discussed in para 11 above, have been followed.

12.3 Useful Life and Tariff Period.-

Regulation 10, read with clause (ac) of sub-regulation (1) of regulation 2 of the RE Tariff Regulations, 2017, specifies the 'useful life' and tariff period in relation to a Solar PV plant as 25 years from the date of commencement of operation of the project. Accordingly, the useful life as well as the tariff period has been taken as 25 years which is also in line with CERC RE Tariff Regulations, 2020.

12.4 Debt Equity Ratio.-

The normative debt equity ratio has been considered as 70:30 in accordance with regulation 23-B of the RE Tariff Regulations, 2017.

12.5 Return on Equity (RoE).-

The normative return on equity has been taken as 14% in accordance with the provisions of RE Tariff Regulations, 2017. The grossed-up RoE for the first 20 years of the useful life of the project has been worked out as 16.96% by considering MAT @ 17.472% (15% MAT rate +12% Surcharge+ 4% Health and Education cess) and for the remaining 5 years the same has been grossed-up as 19.75% by considering corporate tax @ 29.12% (25% tax rate +12% Surcharge+ 4% Health and Education cess).

12.6 Interest on Loan.-

The sub-regulation (1) of regulation 24-B of the RE Tariff Regulation, 2017 provides that the loan tenure of 15 years shall be considered for the purpose of determination of tariff for RE projects. Sub-regulation (2) of the said regulation provides for computation of rate of interest of loan as under:-

“(2) Interest Rate.-

(a) The loan amount (i.e. the debt component) arrived at in the manner indicated in the regulation 23-B shall be considered as gross normative loan for calculation of interest on loan. The normative loan outstanding as on 1st April of every year shall be worked out by deducting the cumulative repayment up to 31st March of previous year from the gross normative loan.

(b) For the purpose of computation of tariff(s) under these Regulations, normative interest rate of two hundred (200) 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, prior to the respective date(s) from which such tariff(s) the respective generic levelled tariffs are to be made applicable, shall be considered:

Provided that in case where the project specific tariff

- (c) Notwithstanding any moratorium period availed by the renewable energy generator, the repayment of loan shall be considered from the first year of the tariff period and shall be equal to the annual depreciation allowed.
- (d) The loan repayment for a financial year or the relevant part period thereof shall be considered to have been done in the middle of that financial year or the relevant part period thereof, as the case may be.”

In view of above, the interest rate has been worked out as 9.91% per annum by allowing 200 basis points above the average of Marginal Cost of Funds based Lending Rate (MCLR) (one year tenor) of State Bank of India (SBI) prevalent during the last available six months preceding 01.04.2020 as shown in the table below:-

Month	Tenor-wise MCLR of SBI
October, 2019	8.05
November, 2019	8.00
December, 2019	7.90
January, 2020	7.90
February, 2020	7.85
March, 2020	7.75
Avg. for last available 6 months.	7.91

12.7 Depreciation.-

(i) Regulation 25-B of the RE Tariff Regulations, 2017 provides as under:

“For the purpose of tariff determination, depreciation shall be computed in the following manner, namely:-

- (a) *the value base for the purpose of depreciation shall be equal to sum total of the debt and equity components as per the provisions of regulation 23-B;*
- (b) *the salvage value shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the value base as per clause (a) of this regulation:*

Provided that no depreciation shall be allowed to the extent of incentive, grant and capital subsidy available for the project.

- (c) *depreciation per annum shall be based on ‘Differential Depreciation Approach’. For tariff purposes, the depreciation shall be allowed @ 4.67% per annum of the value base as per clause (a) of this regulation till such time the requirement for repayment of loan component of the capital cost as per regulations 21-B, 23-B and 24-B is fully provided and the remaining depreciation shall be spread over the residual useful life of the project on straight line method;*

(d) depreciation shall be chargeable from the first year of commencement of operation of the project:

Provided that purposes of project specific determination of tariff.”

Accordingly, the rate of depreciation for the first 15 years has been considered as 4.67% and the rate of depreciation from the 16th year onwards has been spread over the balance useful life as under:-

Details	Solar PV Power Plant
Useful life (in years)	25
Rate of depreciation for 15 years (%)	4.67
Rate of depreciation after first 15 years (%)	1.995

12.8 Interest on Working Capital.-

(i) In accordance with the regulation 27-B of the RE Tariff Regulations, 2017, the working capital requirement of the Solar PV project has been considered by including the following:-

- “(a) operation and maintenance expenses for one month;*
- (b) receivables equivalent to 45 days of energy charges for sale of electricity calculated on the net saleable energy corresponding to the CUF considered for tariff determination on normative basis;*
- (c) maintenance spare @ 15% of operation and maintenance expenses.”*

(ii) Interest rate on working capital has been worked out as 11.41 % per annum by the adding 350 basis points above the average of Marginal Cost of Funds based Lending Rate (MCLR) (one year tenor) of State Bank of India (SBI) prevalent during the last available six months prior to 01.04.2020.

12.9 Incentive and/or subsidy and/or grant/budgetary support by the Central/ State Government.-

(i) The sub-regulation (1) of regulation 22-B of the RE Tariff Regulations, 2017 provides as under:-

“(1) While determining the generic levellised or project specific levellised tariff, as the case may be, for the renewable energy project(s) under these Regulations, the Commission shall take into consideration any incentive and/or subsidy and/or grant available under the schemes of the Central or State Government or their agencies, but excluding accelerated depreciation benefit under the Income Tax Act:

Provided that the capital subsidy under the schemes of the Central or State Government or their agencies shall be adjusted in the normative capital cost and the cost so arrived, after such adjustment, shall be considered for computing

Debt-Equity Components for the purposes of determination of generic levellised tariffs:

Provided further that where the Central Government or the State Government notifies, or has notified, any generation based incentive (GBI) scheme for a particular kind of renewable technology, such technology based generating station shall be assumed to have availed the benefit of such a scheme and their tariffs shall be reduced by the amount of generation based incentive (GBI) per unit for the period during which such incentive remains applicable.

(2) Where any additional project specific grant or budgetary support is available to any project, apart from the incentive and/or subsidy and/or grant available under sub-regulation (1) of this regulation, the Commission shall account for such budgetary support also, while determining project specific levellised tariff.

(3) The amount of subsidy shall be considered for each renewable source as per the applicable policy of the MNRE/ State Government/ Central Government and if the amount and/or mechanism of subsidy is changed by the MNRE/ State Government/ Central Government, consequent corrections in tariffs may be carried out by the Commission in accordance with regulation 20.”

- (ii) No adjustment on account of incentive and/or subsidy and/or grant etc. is being made in the value base for the calculations of Generic Levellised Tariffs under this order. However, the rates at which adjustments shall be made in the Generic Levellised Tariffs on this account have been worked out and mentioned in the attached calculation sheets for each category of the SHPs. The adjustment, if any, on account of the same shall be made at appropriate stage while applying the tariff after taking into account the eligibility conditions in each case. Similarly, adjustment on account of subsidy available under any other subsidy scheme(s) of Government (Central/State) shall also be made at appropriate stage(s) after taking into account the applicable subsidy(ies) available under such scheme(s). The adjustments on account of incentives and/or subsidies and/or grants etc. are to be made at the rates indicated in the calculation sheets on normative basis by considering the provisions of regulations 20-B, 23-B, 24-B, 25-B and 26-B. For this purpose the total amount (in million rupees) of incentive and/or subsidy and/or grant etc., shall be divided by the installed capacity of the projects and the per MW amount (in million rupees) so arrived at, shall be

multiplied by the rate indicated in the calculation sheet for the relevant category of SHPs.

12.10 **Discount Factor.-**

In accordance with sub-regulation (4) of regulation 12 of the RE Tariff Regulations, 2017, the discount factor equivalent to the post tax weighted average cost of capital has been considered for the purpose of levelled tariff computation. The discount factor has been calculated on this basis of the normative debt equity ratio (70:30) and weighed average of the post tax rates for debt and equity component. For this purpose, the interest rate on the loan component (i.e. 70%) of capital cost is 9.91%. For equity component (i.e. 30%), rate of Return of Equity (RoE) is considered as post tax rate of 14%. The discount factor has been calculated as 9.12%. The Corporate tax has been taken as 29.12% (25% IT rate+ 12% Surcharge+ 4% Health and Education cess).

13. **GENERIC LEVELLED TARIFFS AND ASSOCIATED TERMS & CONDITIONS.-**

In light of the discussions made in the preceding paragraphs and the provisions of the RE Tariff Regulations, 2017, the generic levelled tariffs and the associated terms and conditions for solar PV power project for FY 2020-21 under the RE Regulations, 2017 are hereby determined as follows:-

A. The generic levelled tariffs for Solar PV power projects for FY 2020-21 shall be as under:-

Sr. No.	Capacity	Generic levelled tariff (Rs. Per kWh)
1	Projects to be set up in other than industrial areas and urban areas	
(a)	Upto 1.00 MW capacity	3.41
(b)	Above 1.00 MW to 5.00 MW capacity	3.37
2	Projects to be set up in industrial areas and urban areas	
(a)	Upto 1.00 MW capacity	3.48
(b)	Above 1.00 MW to 5.00 MW capacity	3.44

- B. These tariffs, including the associated terms and conditions, shall be subject to the RE Tariff Regulations, 2017 and the orders as may be issued by the Commission thereunder from time to time.
- C. These tariffs are applicable to solar photovoltaic (PV) power projects which directly convert Solar Energy into Electricity, using the crystalline silicon or thin film technology or any other technology as approved by the Ministry of New and Renewable Energy and are connected to the Grid.
- D. These tariffs do not take into account any capital subsidy or any incentive or grant/budgetary support etc. and the adjustment in this regard shall be carried out in accordance with the RE Regulations, 2017. The adjustments, if any, shall be made on pro rata basis in accordance as per the para 12.9 of this Order.
- E. The applicability of these tariffs shall be governed as per the following provisions:-
 - (i) in cases where the joint petition for approval of PPA has been submitted to the Commission on or after 01.04.2020, but not later than 31.03.2021, these tariffs shall be applicable for such capacity(ies) as are commissioned on or before 31.03.2022:

Provided that these rates shall not be applicable in cases where the joint petition for the approval of PPA were filed from 01.04.2020 to 20.07.2020 in view of the relaxation allowed by the Commission due to situation arising out of COVID-19; and

- (ii) in cases where the joint petition for approval of PPA was submitted to the Commission on or before 31.03.2019, these tariffs shall be applicable for such capacity(ies) as are commissioned during the year 2020-21 i.e. for the capacity(ies) for which the Generic Levellised Tariff for 2020-2021 is applicable in accordance with the provisions of the PPAs, the applicable Tariff Order(s) of previous years & the applicable RE Tariff Regulations.

- F. These tariffs shall not be applicable in cases where the distribution licensee procures power through Solar Energy Corporation of India or through competitive bidding at its level in accordance with Section 63 of the Electricity Act, 2003.
- G. These tariffs shall not be applicable in case of the Solar PV projects which are installed by the consumers within their premises (rooftop or ground mounted) under net metering scheme.
14. The detailed computations for Generic Levellised Tariffs for categories of solar PV power projects, without considering any subsidies/incentives/grants, for FY 2020-21 as well as illustrations thereof are attached as per Appendix – “I & II” and “III & IV”.

Sd/-
(Bhanu Pratap Singh)
Member

Sd-
(Devendra Kumar Sharma)
Chairman

Place: Shimla.

Dated: 15th January, 2021.

Annexure-“A”

List of the stakeholders/participants who attended the public hearing on 21st December, 2020.

Sr. No.	Name
1.	Shri Gopal Chand, Special Secretary (NES) to the GOHP.
2.	Shri. Kamlesh Saklani, Law Officer, HPSEBL.
3.	Sh. Vineet Sood, Sr. Project Officer, HIMURJA.
4.	Ms. Deepika Negi, Assistant Engineer, HPPCL.
5.	Shri R.P. Suman, M/s R.P. Suman & Co.

Assumption Parameters for Solar PV Power Projects upto 1 MW

(for project(s) to be setup in area other than Industrial areas and Urban areas)

Sr. No	Assumption Head	Sub Head	Sub Head(2)	Unit	Value
1	Power Generation	Capacity	Installed Generation Capacity	KW	1000
			Capacity Utilisation Factor	%	0.21
			Transmission losses, Auxillary	%	1.45
			Consumption including Transformation Losses		
			Useful Life	%	25
2	Project Cost	Capital Cost /MW	Project Cost	Rs. Lacs/MW	379.05
3	Project Financing	Debt Equity	Tariff Period	Year	25
			Debt	%	70
		Debt Component	Equity	%	30
			Loan Amount	Rs. Lacs/MW	265.335
			Moratorium Period	Year	0
			Repayment Period	Year	15
		Equity Component	Interest Rate	%	9.91
			Equity Amount	Rs. Lacs/MW	113.715
			Return of equity for first 20 Years	%	16.96
			Return of equity from 21st Years onwards	%	19.75
4	Subsidy Depreciation	Subsidy Depreciation	Recovery of Depreciation	%	0
5			Annual Rate of Depreciation till completion of Loan Repayment (balance spread in remaining years)	%	90
			16th year Onward	%	4.67
6	Operation & Maintenance		Total O&M Expenses	Rs. Lacs/MW	1.995
			Annual Escalation	%	8.74
7	Working Capital		O&M Charges	Months	3.84
			Maintenance Spares	% of O&M expenses of a Year	1
			Recievables	Months	15
			Interest on Working capital	%	1.5
8	Discount Factor		Discount Rate	%	11.41
					9.12

Determination of Tariff for Solar PV Power Projects upto 1 MW

Sheet of Appendix I

Unit Generation	unit	year	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
Installed Capacity	KW		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Gross generation	MU		1.840	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Losses	MU		1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
Net Generation	MU		1.813	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Fixed Cost		year																									
O&M Expences	Rs lacs		8.74	9.076	9.42	9.79	10.16	10.55	10.96	11.38	11.81	12.27	12.74	13.23	13.74	14.26	14.81	15.38	15.97	16.58	17.22	17.88	18.57	19.28	20.02	20.79	21.59
Depreciation	Rs lacs		17.70	17.70	17.70	17.70	17.70	17.70	17.70	17.70	17.70	17.70	17.70	17.70	17.70	17.70	17.70	7.56	7.56	7.56	7.56	7.56	7.56	7.56	7.56	7.56	7.56
Interest on Term Loan	Rs lacs		25.42	23.67	21.91	20.16	18.41	16.65	14.90	13.15	11.39	9.64	7.89	6.14	4.38	2.63	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rs lacs		1.27	1.25	1.24	1.23	1.22	1.21	1.21	1.20	1.19	1.18	1.18	1.17	1.17	1.16	1.16	1.03	1.05	1.08	1.10	1.13	1.20	1.23	1.26	1.30	1.33
Return on Equity	Rs lacs		19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	19.29	22.46	22.46	22.46	22.46	22.46
Total fixed Cost	Rs lacs		72.41	70.98	69.57	68.17	66.78	65.41	64.05	62.71	61.39	60.08	58.79	57.52	56.28	55.05	53.84	43.26	43.87	44.51	45.17	45.86	49.80	50.54	51.31	52.11	52.94
Levelling CoG																											
Per unit CoG	Unit	levellised																									
O&M Expences	Rs/kWh	0.67	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.63	0.65	0.68	0.70	0.73	0.76	0.79	0.82	0.85	0.88	0.91	0.95	0.99	1.02	1.06	1.10	1.15	1.19
Depreciation	Rs/kWh	0.88	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Interest on Term Loan	Rs/kWh	0.72	1.40	1.31	1.21	1.11	1.02	0.92	0.82	0.73	0.63	0.53	0.44	0.34	0.24	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rs/kWh	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
Return on Equity	Rs/kWh	1.08	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.24	1.24	1.24	1.24	1.24
Total CoG	Rs/kWh	3.41	3.99	3.9154	3.84	3.76	3.68	3.61	3.53	3.46	3.39	3.31	3.24	3.17	3.10	3.04	2.97	2.39	2.42	2.46	2.49	2.53	2.75	2.79	2.83	2.87	2.92
Discounted factor	%	1	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12	0.12
Levelling Tariff	Rs/kWh	3.41	3.99	3.5881	3.22	2.89	2.60	2.33	2.09	1.88	1.68	1.51	1.35	1.21	1.09	0.98	0.88	0.64	0.60	0.56	0.52	0.48	0.48	0.45	0.41	0.39	0.36

Generic Levellised Tariff (without Subsidy) at Capital Cost of Rs 379.05 Lac/MW = Rs. 3.41 /kWh

Indicative Generic Levellised Tariff by considering Subsidy/Incentive/Grant of Rs 1 million Lac/MW = Rs. 3.34 /kWh

Reduction in rate for one Million rupees of Subsidy/Incentive/Grant etc per MW of capacity= Rs. 0.07/kWh [Please refer para 12.9 (ii) of the Order]

Assumption Parameters for Solar PV Power Projects above 1 MW to 5 MW

(for project(s) to be setup in area other than Industrial areas and Urban areas)

Sr. No	Assumption Head	Sub Head	Sub Head(2)	Unit	Value
1	Power Generation	Capacity	Installed Generation Capacity	KW	1000
			Capacity Utilisation Factor	%	0.21
			Transmission losses, Auxillary	%	1.45
			Consumption including Transformation Losses		
			Useful Life	%	25
2	Project Cost	Capital Cost /MW	Project Cost	Rs. Lacs/MW	373.45
3	Project Financing	Debt Equity	Tariff Period	Year	25
			Debt	%	70
			Equity	%	30
		Debt Component	Loan Amount	Rs. Lacs/MW	261.415
			Moratorium Period	Year	0
			Repayment Period	Year	15
			Interest Rate	%	9.91
		Equity Component	Equity Amount	Rs. Lacs/MW	112.035
			Return of equity for first 20 Years	%	16.96
			Return of equity from 21st Years onwards	%	19.75
4	Subsidy Depreciation	Subsidy Depreciation	Recovery of Depreciation	%	0
5			Annual Rate of Depreciation till completion of Loan Repayment (balance spread in remaining years)	%	90
			16th year Onward	%	4.67
6	Operation & Maintenance		Total O&M Expenses	Rs. Lacs/MW	1.995
			Annual Escalation	%	8.74
7	Working Capital		O&M Charges	Months	3.84
			Maintenance Spares	% of O&M expenses of a Year	1
			Recievables	Months	15
			Interest on Working capital	%	1.5
8	Discount Factor		Discount Rate	%	11.41
					9.12

Determination of Tariff for Solar PV Power Projects above 1 MW to 5 MW

Sheet of Appendix II

Unit Generation	unit	year	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
Installed Capacity	KW		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Gross generation	MU		1.840	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Losses	MU		1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
Net Generation	MU		1.813	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Fixed Cost		year																									
O&M Expences	Rs lacs		8.74	9.076	9.42	9.79	10.16	10.55	10.96	11.38	11.81	12.27	12.74	13.23	13.74	14.26	14.81	15.38	15.97	16.58	17.22	17.88	18.57	19.28	20.02	20.79	21.59
Depreciation	Rs lacs		17.44	17.44	17.44	17.44	17.44	17.44	17.44	17.44	17.44	17.44	17.44	17.44	17.44	17.44	17.44	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45
Interest on Term Loan	Rs lacs		25.04	23.32	21.59	19.86	18.13	16.41	14.68	12.95	11.23	9.50	7.77	6.04	4.32	2.59	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rs lacs		1.25	1.24	1.23	1.22	1.21	1.20	1.19	1.19	1.18	1.17	1.17	1.16	1.16	1.16	1.15	1.02	1.05	1.07	1.10	1.12	1.20	1.23	1.26	1.29	1.32
Return on Equity	Rs lacs		19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	19.00	22.13	22.13	22.13	22.13	22.13
Total fixed Cost	Rs lacs		71.48	70.07	68.68	67.31	65.95	64.60	63.27	61.96	60.66	59.38	58.12	56.88	55.66	54.45	53.27	42.85	43.47	44.11	44.77	45.46	49.35	50.09	50.86	51.66	52.49
Levellised CoG																											
Per unit CoG	Unit	levellised																									
O&M Expences	Rs/kWh	0.67	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.63	0.65	0.68	0.70	0.73	0.76	0.79	0.82	0.85	0.88	0.91	0.95	0.99	1.02	1.06	1.10	1.15	1.19
Depreciation	Rs/kWh	0.86	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Interest on Term Loan	Rs/kWh	0.71	1.38	1.29	1.19	1.10	1.00	0.91	0.81	0.71	0.62	0.52	0.43	0.33	0.24	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rs/kWh	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
Return on Equity	Rs/kWh	1.06	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.05	1.22	1.22	1.22	1.22	1.22
Total CoG	Rs/kWh	3.37	3.94	3.8652	3.79	3.71	3.64	3.56	3.49	3.42	3.35	3.28	3.21	3.14	3.07	3.00	2.94	2.36	2.40	2.43	2.47	2.51	2.72	2.76	2.81	2.85	2.90
Discounted factor	%		1	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12
Levellised Tariff	Rs/kWh	3.37	3.94	3.5422	3.18	2.86	2.57	2.30	2.07	1.86	1.66	1.49	1.34	1.20	1.08	0.97	0.87	0.64	0.59	0.55	0.51	0.48	0.48	0.44	0.41	0.38	0.36

Generic Levellised Tariff (without Subsidy) at Capital Cost of Rs 373.45 Lac/MW = Rs. 3.37 /kWh

Indicative Generic Levellised Tariff by considering Subsidy/Incentive/Grant of Rs 1 million/MW = Rs. 3.30 /kWh

Reduction in rate for one Million rupees of Subsidy/Incentive/Grant etc per MW of capacity= Rs. 0.07/kWh [Please refer para 12.9 (ii) of the Order]

Assumption Parameters for Solar PV Power Projects upto 1 MW

(for project(s) to be setup in Industrial areas and Urban areas)

Sr. No	Assumption Head	Sub Head	Sub Head(2)	Unit	Value
1	Power Generation	Capacity	Installed Generation Capacity	KW	1000
			Capacity Utilisation Factor	%	0.21
			Transmission losses, Auxillary	%	1.45
			Consumption including Transformation Losses		
			Useful Life	%	25
2	Project Cost	Capital Cost /MW	Project Cost	Rs. Lacs/MW	389.20
3	Project Financing	Debt Equity	Tariff Period	Year	25
			Debt	%	70
			Equity	%	30
		Debt Component	Loan Amount	Rs. Lacs/MW	272.44
			Moratorium Period	Year	0
			Repayment Period	Year	15
			Interest Rate	%	9.91
		Equity Component	Equity Amount	Rs. Lacs/MW	116.76
			Return of equity for first 20 Years	%	16.96
			Return of equity from 21st Years onwards	%	19.75
4	Subsidy Depreciation	Subsidy Depreciation	Recovery of Depreciation	%	0
5			Annual Rate of Depreciation till completion of Loan Repayment (balance spread in remaining years)	%	90
			16th year Onward	%	4.67
6	Operation & Maintenance		Total O&M Expenses	Rs. Lacs/MW	1.995
			Annual Escalation	%	8.74
7	Working Capital		O&M Charges	Months	3.84
			Maintenance Spares	% of O&M expenses of a Year	1
			Recievables	Months	15
			Interest on Working capital	%	1.5
8	Discount Factor		Discount Rate	%	11.41
					9.12

Determination of Tariff for Solar PV Power Projects upto 1 MW

Sheet of Appendix III

Unit Generation	unit	year	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
Installed Capacity	KW		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Gross generation	MU		1.840	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Losses	MU		1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
Net Generation	MU		1.813	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Fixed Cost		year																									
O&M Expences	Rs lacs		8.74	9.076	9.42	9.79	10.16	10.55	10.96	11.38	11.81	12.27	12.74	13.23	13.74	14.26	14.81	15.38	15.97	16.58	17.22	17.88	18.57	19.28	20.02	20.79	21.59
Depreciation	Rs lacs		18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18	18.18	7.76	7.76	7.76	7.76	7.76	7.76	7.76	7.76	7.76	7.76
Interest on Term Loan	Rs lacs		26.10	24.30	22.50	20.70	18.90	17.10	15.30	13.50	11.70	9.90	8.10	6.30	4.50	2.70	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rs lacs		1.29	1.28	1.27	1.25	1.24	1.23	1.23	1.22	1.21	1.20	1.20	1.19	1.18	1.18	1.18	1.04	1.06	1.09	1.11	1.14	1.22	1.25	1.28	1.31	1.34
Return on Equity	Rs lacs		19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	19.80	23.06	23.06	23.06	23.06	23.06
Total fixed Cost	Rs lacs		74.11	72.63	71.17	69.72	68.28	66.86	65.46	64.07	62.70	61.35	60.01	58.70	57.40	56.12	54.87	43.98	44.60	45.24	45.90	46.59	50.61	51.35	52.12	52.93	53.76
Levellised CoG																											
Per unit CoG	Unit	levellised																									
O&M Expences	Rs/kWh	0.67	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.63	0.65	0.68	0.70	0.73	0.76	0.79	0.82	0.85	0.88	0.91	0.95	0.99	1.02	1.06	1.10	1.15	1.19
Depreciation	Rs/kWh	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Interest on Term Loan	Rs/kWh	0.74	1.44	1.34	1.24	1.14	1.04	0.94	0.84	0.74	0.65	0.55	0.45	0.35	0.25	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rs/kWh	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
Return on Equity	Rs/kWh	1.10	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.27	1.27	1.27	1.27	1.27
Total CoG	Rs/kWh	3.48	4.09	4.0062	3.93	3.85	3.77	3.69	3.61	3.53	3.46	3.38	3.31	3.24	3.17	3.10	3.03	2.43	2.46	2.50	2.53	2.57	2.79	2.83	2.88	2.92	2.97
Discounted factor	%	1	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12	0.12
Levellised Tariff	Rs/kWh	3.48	4.09	3.6714	3.30	2.96	2.66	2.38	2.14	1.92	1.72	1.54	1.38	1.24	1.11	1.00	0.89	0.66	0.61	0.57	0.53	0.49	0.49	0.45	0.42	0.39	0.37

Generic Levellised Tariff (without Subsidy) at Capital Cost of Rs 389.20 Lac/MW = Rs. 3.48 /kWh

Indicative Generic Levellised Tariff by considering Subsidy/Incentive/Grant of Rs 1 million/MW = Rs. 3.41 /kWh

Reduction in rate for one Million rupees of Subsidy/Incentive/Grant etc per MW of capacity= Rs. 0.07/kWh [Please refer para 12.9 (ii) of the Order]

Assumption Parameters for Solar PV Power Projects above 1 MW to 5 MW

(for project(s) to be setup in Industrial areas and Urban areas)

Sr. No	Assumption Head	Sub Head	Sub Head(2)	Unit	Value
1	Power Generation	Capacity	Installed Generation Capacity	KW	1000
			Capacity Utilisation Factor	%	0.21
			Transmission losses, Auxillary	%	1.45
			Consumption including Transformation Losses		
			Useful Life	%	25
2	Project Cost	Capital Cost /MW	Project Cost	Rs. Lacs/MW	383.45
3	Project Financing	Debt Equity	Tariff Period	Year	25
			Debt	%	70
			Equity	%	30
		Debt Component	Loan Amount	Rs. Lacs/MW	268.415
			Moratorium Period	Year	0
			Repayment Period	Year	15
			Interest Rate	%	9.91
		Equity Component	Equity Amount	Rs. Lacs/MW	115.035
			Return of equity for first 20 Years	%	16.96
			Return of equity from 21st Years onwards	%	19.75
4	Subsidy Depreciation	Subsidy Depreciation	Recovery of Depreciation	%	0
5			Annual Rate of Depreciation till completion of Loan Repayment (balance spread in remaining years)	%	90
			16th year Onward	%	4.67
6	Operation & Maintenance		Total O&M Expenses	Rs. Lacs/MW	1.995
			Annual Escalation	%	8.74
7	Working Capital		O&M Charges	Months	3.84
			Maintenance Spares	% of O&M expenses of a Year	1
			Recievables	Months	15
			Interest on Working capital	%	1.5
8	Discount Factor		Discount Rate	%	11.41
					9.12

Determination of Tariff for Solar PV Power Projects above 1 MW to 5 MW

Sheet of Appendix IV

Unit Generation	unit	year	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
Installed Capacity	KW		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Gross generation	MU		1.840	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84
Losses	MU		1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
Net Generation	MU		1.813	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81	1.81
Fixed Cost		year																									
O&M Expences	Rs lacs		8.74	9.076	9.42	9.79	10.16	10.55	10.96	11.38	11.81	12.27	12.74	13.23	13.74	14.26	14.81	15.38	15.97	16.58	17.22	17.88	18.57	19.28	20.02	20.79	21.59
Depreciation	Rs lacs		17.91	17.91	17.91	17.91	17.91	17.91	17.91	17.91	17.91	17.91	17.91	17.91	17.91	17.91	17.91	7.65	7.65	7.65	7.65	7.65	7.65	7.65	7.65	7.65	7.65
Interest on Term Loan	Rs lacs		25.71	23.94	22.17	20.39	18.62	16.85	15.07	13.30	11.53	9.75	7.98	6.21	4.43	2.66	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rs lacs		1.28	1.26	1.25	1.24	1.23	1.22	1.21	1.21	1.20	1.19	1.19	1.18	1.18	1.17	1.17	1.03	1.06	1.08	1.11	1.13	1.21	1.24	1.27	1.30	1.33
Return on Equity	Rs lacs		19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	19.51	22.72	22.72	22.72	22.72	22.72
Total fixed Cost	Rs lacs		73.15	71.70	70.26	68.84	67.43	66.04	64.66	63.30	61.96	60.63	59.32	58.03	56.76	55.51	54.28	43.57	44.19	44.83	45.49	46.18	50.15	50.89	51.66	52.46	53.29
Levellised CoG																											
Per unit CoG	Unit	levellised																									
O&M Expences	Rs/kWh	0.67	0.48	0.50	0.52	0.54	0.56	0.58	0.60	0.63	0.65	0.68	0.70	0.73	0.76	0.79	0.82	0.85	0.88	0.91	0.95	0.99	1.02	1.06	1.10	1.15	1.19
Depreciation	Rs/kWh	0.89	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Interest on Term Loan	Rs/kWh	0.73	1.42	1.32	1.22	1.12	1.03	0.93	0.83	0.73	0.64	0.54	0.44	0.34	0.24	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	Rs/kWh	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
Return on Equity	Rs/kWh	1.09	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.25	1.25	1.25	1.25	1.25
Total CoG	Rs/kWh	3.44	4.03	3.9548	3.88	3.80	3.72	3.64	3.57	3.49	3.42	3.34	3.27	3.20	3.13	3.06	2.99	2.40	2.44	2.47	2.51	2.55	2.77	2.81	2.85	2.89	2.94
Discounted factor	%	1	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12	0.12
Levellised Tariff	Rs/kWh	3.44	4.03	3.6242	3.25	2.92	2.62	2.35	2.11	1.90	1.70	1.52	1.37	1.23	1.10	0.98	0.88	0.65	0.60	0.56	0.52	0.49	0.48	0.45	0.42	0.39	0.36

Generic Levellised Tariff (without Subsidy) at Capital Cost of Rs 383.45 Lac/MW = Rs. 3.44 /kWh

Indicative Generic Levellised Tariff by considering Subsidy/Incentive/Grant of Rs 1 million/MW = Rs. 3.37 /kWh

Reduction in rate for one Million rupees of Subsidy/Incentive/Grant etc per MW of capacity= Rs. 0.07/kWh [Please refer para 12.9 (ii) of the Order]