

HIMACHAL PRADESH ELECTRICITY REGULATORY COMMISSION, SHIMLA

Suo-Motu Petition No. 1/2018

CORAM

Sh. S.K.B.S. Negi
Chairman

Sh. Bhanu Pratap Singh
Member

Date of Public hearing 05.02.2018

Date of Order: 12.02.2018

IN THE MATTER OF:-

Determination of generic levelled tariffs for Solar PV Projects for various durations of FY 2017-18 under the applicable RE Tariff Regulations.

ORDER

1. The Commission determined the solar PV generic levelled tariffs vide Order dated 06.07.2016 for FY 2016-17, under regulations 17 of the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2012 (hereinafter referred to as "RE Tariff Regulations, 2012").
2. The Commission subsequently notified the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2017, on 23rd November, 2017 in the Rajpatra, Himachal Pradesh (hereinafter referred to as "RE Tariff Regulations, 2017"), which have come into force from 1st October, 2017.
3. Keeping in view the fact that the RE Tariff Regulations, 2012 were revised w.e.f 01.10.2017 and two different sets of Regulations are applicable for the two halves of the FY 2017-18 and also the fact that a single rate for FY 2017-18 is also required to be determined for applicability, as per PPA provisions, in situations involving slippages in commissioning of the projects. The Commission proposed to determine the generic levelled tariffs for different duration of FY 2017-18.
4. The Commission, in due discharge of the mandate under regulations 17 of RE Tariff Regulations, 2012 and regulation 18 of RE Tariff Regulations, 2017 proposed to determine the generic levelled tariff of solar PV projects and associated terms and conditions as per Part **A, B & C** of proposal (suo-moto petition No. 1/2018) dated 12.01.2018.
5. The Commission invited objections/suggestions from public on its aforesaid proposal, by way of insertions in two News Papers i.e. "Amar Ujala" and "Hindustan Times" on 13th January, 2018. The text of said proposal was made available on the Commission's website www.hperc.org.

6. The Commission, vide letter dated 16.01.2018, requested the major stakeholders, including Industries Associations, State Government, Directorate of Energy, HIMURJA, HPPCL and HPSEB Limited i.e. Distribution Licensee to send their objections/suggestions as per the aforesaid public notice.
7. In response, written comments/suggestions were received from only one stakeholder i.e. Surya Ushma Pvt. Ltd., HR-62A, FF, Pul Pehlad Pur, Badar Pur, New Delhi- 110044.
8. Subsequently, a public hearing was held on 05.02.2018, the following stakeholders were present during the hearing:-
 - (i) The Himachal Pradesh State Electricity Board Limited, Vidyut Bhawan, Shimla-171004(HP).
 - (ii) The Directorate of Energy, Shanti Bhawan, Phase-III, Sector-4, New Shimla-171009 (HP).
9. The Commission has considered the views/comments/suggestions of stakeholders expressed during public hearing and made vide written submission.
 - A. During the hearing, the representative of Himachal Pradesh State Electricity Board Limited have made verbal submission that they have no objection on the Commission's proposal dated 12.01.2018.
 - B. M/s Surya Ushma Pvt. Ltd. has made a written submission to extend CoD of their project, by a period of six months so that the solar PV (5.00 MW) project shall be eligible for tariff already agreed in the PPA in case project get commissioned on or before 31.03.2018.

Commission's View:-

The Commission is of the view that the request made by M/s Surya Ushma Pvt. Ltd. is not relevant in the present regulatory process.

The Model PPA for solar PV projects issued as per the Commission's order dated 29th February, 2016 also provides as:-

"6.2. Tariff for Net Saleable Energy:-

- (a) The HPSEBL shall pay for the Net Saleable Energy delivered and sold to it by the Company at the interconnection point at a fixed rate of Rs..... per kWh. This rate also accounts for-
 - (i) capital subsidy @ Rs..... (i.e. 90% of the capital subsidy of Rs.....).
 - (ii) accelerated depreciation benefit @..... paise per kWh based on accelerated depreciation @..... % (i.e. rate without adjustment of accelerated benefit less rate with accelerated benefit); and
 - (iii) commissioning of the entire capacity of the project on or before..... .
- (b) The rate of Rs. per kWh as per clause (a) above is firm and fixed and shall not be subject to any indexation, escalation, adjustment or review due to any reason whatsoever except for the adjustment on the following line and for specific provisions under Section 8.8.
 - (i) The rate given above shall be applicable if the entire capacity of the project commissioned or on before 31.03.2018 i.e. 31st March of the year

immediately succeeding the financial year in which PPA is signed after approval of the Commission. However, if the commissioning of the project is delayed beyond the said date, the rate determined by the Commission for the category under which the total capacity of the project falls for the financial year(s) immediately preceding the respective financial year(s) in which the capacities are commissioned for the respective capacity(ies) or the rate of Rs per unit as above whichever is lower, shall be applicable.

For this purpose, weighted average rate based on the capacity(ies) commissioned during different financial year(s) and respective applicable rates as per above provisions shall be worked out from time to time.

- (ii) In case the capital subsidy or incentive and/or subsidy and/or grant etc. as admissible to the company is at variance from the same given at serial No(i) of clause (a) above, the tariff shall be adjusted as per the provisions of determination of generic levellised tariffs for solar PV projects under regulation 17 of the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2012.”

M/s Surya Ushma Pvt. Ltd. has already executed the PPA for its solar PV projects (5.00 MW) on 31st March, 2017 on the aforesaid terms and conditions of the PPA. In case any slippage in the CoD of solar PV project(s) beyond 31.03.2018, the tariff shall be governed as per **Part-C** of para 11 of this order.

10. **The Generic levellised tariffs and Associated Terms and Conditions.-**

In light of the discussions made in the preceding paragraphs, the Commission hereby determines the generic levellised tariffs and the associated terms and conditions for Solar PV power plant in respect of FY 2017-18 as per the following **Part-A, B & C** of para 11 of this order:-

11. **Part-A:-**

Generic levellised tariffs for Solar PV Projects under RE Tariff Regulations, 2012 applicable from 01.04.2017 to 30.09.2017.-

The generic levellised tariffs and associated terms and conditions for various categories of solar PV projects in respect of the period 01.04.2017 to 30.09.2017 forming part FY 2017-18 have been computed in accordance with the RE Tariff Regulations, 2012 as discussed in the following paragraphs:-

1. As per the Sub-regulation (1) of regulation 17 of the RE Tariff Regulation, 2012 read with 1st amendment dated 19th February, 2015, published in the Rajpatra, Himachal Pradesh, the Commission may determine separate generic levellised tariffs for renewable energy projects, other than small hydro projects. The regulation 17 of RE Tariff Regulations also provides that:-

“17 (1).....xxxxxxxxx.....

(2)Where the technological specific parameters and other terms and conditions, including the tariff period and useful life of the project, have not been specified, the Commission may, by an order, at any time and at such intervals as it considers appropriate to do so, fix the same.

.....xxxxxxxxx....

Provided further that the Commission may, by order, categorize the renewable energy projects, other than SHPs, under the respective renewable energy technologies specified in sub –regulation (1), based on the capacity of projects, the available subsidy schemes and such other factors as may be considered appropriate by it:

Provided further 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 MW for any such technology, the technological specific parameters, including capital cost, and other terms and conditions, as notified, or may be notified, by the Central Commission under the Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination for Renewable Energy Sources) Regulations, 2012, in respect of the relevant financial years of the control period ending on 31st March, 2017, for the relevant renewable energy technology, as may be considered appropriate by it.”; and

Provided further that the financial norms, except for capital cost, as specified under Chapter-IV of these Regulations shall also be considered as ceiling norms.

(3) The Commission may, after having fixed the norms/ parameters and other related terms and conditions as per sub-regulation (2), determine, by order generic levellised tariff(s) for any or all categories of such renewable energy technology(ies).

Provided that the Commission may, by order, fix, on annual basis, the ceiling rates and associated terms and conditions to be used by the licensee for reverse bidding for procurement of power from the projects based on such technologies.

(3A)xxxxxxxxxxxx..... .

(4)xxxxxxxxxxxx..... .

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2.This aims at fixing the technologies specific parameters and the generic levellised tariff for solar PV projects upto 5.00 MW in accordance with the RE Tariff Regulations, 2012. The detail hereby discussed in following paragraph.

3. Categorization

The 2nd proviso of sub-regulation (2) of regulation 17 of RE Tariff Regulations, 2012 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. Taking into view the geographical and topographical conditions in the State and in order to promote smaller capacities of solar PV plants at different locations across the state and also realizing the fact 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. The Commission, in its solar PV Tariff Order dated 06.07.2016 for FY 2016-17, categorized such projects on the basis of installed capacity, as under:-

Capacity	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 Commission retains the above categorization for the period under consideration also.

4. **Technology Specific Parameters.-**

The sub- regulation (2) of regulation 17 of the RE Tariff Regulations, 2012 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, as notified, or may be notified, by the Central Commission under its RE Tariff Regulations. For FY 2017-18, the CERC has not determined a benchmark capital cost for solar PV projects and CERC RE Tariff Regulations, 2017 also do not envisage determination of generic tariff for the projects with such technology. Accordingly, the Commission evolves its own technology specific parameters after taking into account the various available inputs, including those notified by CERC for FY 2016-17.

4.1 **CAPITAL COST.-**

The Commission observed in its proposal that the capital cost of solar PV modules varies significantly and the declining cost trend may continue in near future as well.

Taking into consideration the provision of sub-regulation (2) of regulation 20 of the RE Tariff Regulations, 2012, the normative capital cost of solar PV projects considered by some of the SERCs for FY 2017-18, the item wise capital cost considered by CERC for FY 2016-17 and also after taking into account the State specific features, the Commission considers the normative capital cost for the solar PV projects above 1 MW to 5 MW capacity as under:-

Sr. No.	Particulars	Capital Cost norm
		(Rs. Lakh/MW)
1	PV Modules	235
2	Land Cost	35
3	Civil and General Works	35
4	Mounting Structures	35
5	Power Conditioning Units	35
6	Evacuation cost upto interconnection point	50
7	Preliminary and Pre-operative expenses	21
	Total Capital Cost	446

The normative capital cost for the solar PV projects upto 1.00 MW is considered to be fixed by allowing an increase of about 1.5% on the normative cost for the projects above 1.00 MW and upto 5.00 MW as considered above. Accordingly the normative capital cost for the solar PV projects upto 1.00 MW is considered as Rs. 452.7 Lakhs per MW.

4.2 **Operation and Maintenance Expenses.-**

The CERC in its notification dated 30.06.2016 allowed the O&M expenses @ Rs. 7.00 Lakhs/MW for FY 2016-17. The Commission in its solar PV tariff order for

FY 2016-17 also considered the O&M expenses as Rs. 7.00 Lakhs/MW with annual escalation of 5.72%. After allowing escalation of 5.72% on the said base rate, the Commission considers O&M expenses as Rs. 7.40 Lakhs/ MW for FY 2017-18. These O&M expenses shall be escalated @ 5.72% per annum during the useful life of the plant.

4.3 Normative Net Saleable Energy.-

The CERC RE Tariff Regulations, 2012 provide that the annual normative Capacity Utilization Factor (CUF) of solar PV plant shall be 19%. The Commission adopts this norm. However the annual net saleable energy shall be worked out on normative basis by considering energy losses @ 0.7% of the generation to cover the losses on the project line upto the interconnection point on normative basis and the annual CUF of 19%. No other deduction, except Govt. supply on account of royalty power etc. if any, shall be made to arrive at the net saleable energy on normative basis.

4.4 The other technological specific parameters i.e. useful life of the project and tariff period, have already been specified in the RE Tariff Regulations, 2012, which are otherwise in line with the CERC RE Tariff Regulations also and the same are to be followed accordingly.

5. After having fixed the technological specific parameters as above, the Commission now proceeds to determine the generic levellised tariffs, based on the provisions of the RE Tariff Regulations, 2012 for solar PV projects for the period 01.04.2017 to 30.09.2017 forming part of FY 2017-18 under regulation 17 of the RE Tariff Regulations, 2012. The main details of the tariffs are as follows:-

5.1 Tariff Structure.-

Regulation 11 of the RE Tariff Regulations, 2012, stipulates that single part levellised tariff structure 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.

5.2 Technology Specific Parameters.-

The normative parameters for capital cost, O&M charges, CUF, applicability of tariff as discussed in para 4.0 above, have been followed.

5.3 Useful Life and Tariff Period.-

Regulation 10, read with clause (aa) of sub-regulation (1) of Regulation 2 of the RE Tariff Regulations, 2012, 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 and tariff period has been taken as 25 years which is also in line with CERC RE Tariff Regulations, 2012.

5.4 Debt Equity Ratio.-

The normative debt equity ratio has been considered as 70:30 in accordance with Regulation 22 of the RE Tariff Regulations, 2012.

5.5 Return on Equity.-

Regulation 25 of the RE Tariff Regulations, 2012 provides that the value base for the equity shall be 30% of the normative capital cost as determined under Regulation 20 and that the normative return on equity is as under:-

- (a) 19% per annum for the first 10 years.
- (b) 22% per annum from 11th year onwards.

The return on equity has accordingly been considered at the above rates.

5.6 Interest on Loan.-

Sub-regulation (2) of Regulation 23 of the RE Tariff Regulations, 2012 provides that the loan tenure of 12 years is considered, for the purpose of determination of Tariff for RE projects. Sub-regulation (2) of said regulations provides for computation of rate of interest of loan as under:-

“23 (2) Interest Rate:-

- (a) The loan arrived at in the manner, indicated in Regulation 22 shall be considered as gross normative loan for calculation for interest on loan. The normative loan outstanding as on April 1st of every financial year shall be worked out by deducting the cumulative repayment, inclusive of the prepayment, upto March 31st of the previous financial year from the gross normative loan on normative basis.
- (b) For the purpose of computation of tariff, the Average of State Bank of India Base rate(s), prevalent during a period of 6 months, preceding the date of commencement of these Regulations, plus 300 basis points, shall be considered as the normative interest rate.
Provided that where tariff is to be determined on financial year basis, in the control period, the Average Base Rate(s) of the State Bank of India (SBI), prevalent during the first six months, of the previous year plus 300 basis points, shall be considered as the normative interest rate.
- (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”.

As per the proviso to clause (b) of sub-regulation (2) of regulation 23 of RE Tariff Regulations, 2012, the interest rate has been taken as 9.30%, as per the State Bank of India (SBI) Base Rate prevalent during the first six months of FY 2016-17, which have been worked out to 12.30%. The computations of normative interest on loan has been carried out in tariffs by treating 70% of the capital cost as the base value of loan.

5.7 Depreciation.-

Regulation 24 of the RE Tariff Regulations, 2012 provides as under:

For the purpose of tariff determination, depreciation is computed in the following manner, namely:-

“(a) the value base for the purpose of depreciation shall be the normative capital cost (for generic tariff) or the capital cost of the project as admitted by the Commission (for project specific tariff), as the case may be;

(b) the salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset;

(c) depreciation per annum shall be based on ‘Differential Depreciation Approach’. For tariff purposes, the depreciation shall be allowed @ 5.83 % per annum till such time, the requirement for repayment of loan component of the capital cost as per Regulations 20, 22 and 23 after adjusting the amount of subsidy as per Regulation 21, is fully provided and the remaining depreciation shall be spread over the residual useful life of the project as per straight line method;

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

5.8 No adjustment has been made on account of subsidy in the tariff calculations and as such the rate of depreciation for the first 12 years has been considered as 5.83% and the rate of depreciation from the 13th 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 12 years (%)	5.83%
Rate of depreciation after first 12 years (%)	1.54%

5.9 Interest on Working Capital.-

In accordance with sub-regulation (1) of the Regulation 26 of the RE Tariff Regulations, 2012, the working capital requirement of solar PV plant comprises of the following:-

- Operation and maintenance expenses for one month;
- Receivables equivalent to 2 (two) months of energy charges for sale of electricity, calculated on the net saleable energy corresponding to the CUF, considered for tariff determination on normative basis;
- Maintenance spares @ 15% of operation and maintenance expenses.

Sub regulation 4 of the said regulation 26 provides as under:-

(4) Interest on working capital shall be the interest rate equivalent to average of SBI Base Rate (s), prevalent during the period of 6 months, preceding the date of commencement of these Regulations, plus 350 basis points.

Provided that in cases where tariff is to be determined on financial year basis, in the control period, the Average Base Rate(s) of the State Bank of India (SBI), prevalent during the first six months of the previous year plus 350 basis points, shall be considered as the normative interest rate.

5.10 In view of provisions brought out in para-5.9, the interest on working capital has been worked out, on normative basis, as under:-

Details	Solar PV power plant
(i) O&M expenses (month)	1
(ii) Maintenance spares (%) of O&M expenses	15
(iii) Receivables (months)	2
Interest on working Capital @ 350 basis points above average base rate of 9.30% (see para relating to interest on loan)	12.80%

5.11 **Subsidy or Incentive or Grant/Budgetary Support by the Central/State Government.-**

The sub-regulation (1) of Regulation 21 of the RE Tariff Regulations provides as under:

“(1) While determining the generic levelled or project specific levelled 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 its agencies, including accelerated depreciation benefit under the Income Tax Act:

Provided that for tariff determination, 90% of the capital subsidy available to the project as per applicable scheme of the MNRE/ State Government shall be considered:

Provided further that the Commission may evolve suitable mechanisms for incorporating impact of the subsidy component for determination or adjustment of generic levelled tariffs for various categories of projects.

Provided further that the capital subsidy under the schemes of the Central or State Government or its agencies, shall, unless the circumstances otherwise warrant, be ordinarily adjusted against the principal component of the loan amount as additional reduction apart from the normal payment:

.....xxxxxxxx.....”

5.12 In accordance with sub-regulation (3) of regulation 21 of RE Tariff Regulations, 2012, the amount of subsidy shall be considered for each renewable source as per the applicable policy of the MNRE/State Government.

5.13 No capital subsidy or incentive or grant/budgetary support has been considered in these calculations. In case a solar PV project is entitled to any incentive and/or subsidy and/or grant available, subsidy/budgetary support/grant/generation based incentive (GBI)/ viability gap funding (VGF), under the schemes of the Central or State Government or their agencies, the same shall be adjusted by the distribution licensee at the time of signing the PPA, as per regulation 21 of RE Tariff Regulations, 2012. However, the accelerated depreciation benefit has been taken into consideration in this proposal as per para-5.15.

5.14 **Discount Factor.-**

In accordance with sub-regulation (4) of regulation 11 of the RE Tariff Regulations, 2012, the discount factor equivalent to the post tax weighted average cost of capital is to be considered for the purpose of levelled tariff computation. The discount factor has been calculated on this basis by following the normative debt: equity ratio (70:30). For this purpose, the interest rate for the loan component (i.e. 70%) of Capital Cost has been considered as 9.30% (as explained in para – 5.6) which has been adjusted for the corporate tax. For equity component (i.e. 30% of the capital cost), the post tax RoE has been computed as 14.69% by adjusting the normative RoE of 19% per annum for first 10 years with MAT and 22% per annum for the remaining period with corporate tax. The rates for MAT & Corporate tax have been taken as 20.26% and 30% respectively. The surcharge and education cess have also been considered @ 12% and 3% respectively. Based on above, the annual discount rate has been calculated as 10.04%.

5.15 Accelerated Depreciation Benefit.-

The sub-regulation 4 and 5 of regulation 21 of the RE Tariff Regulations, 2012 provide as under:-

“(4) The Commission shall determine two generic levelled tariffs or project specific levelled tariffs, as the case may be, one by considering accelerated depreciation and the other without it, and the tariff to any renewable energy generator shall be applicable as provided in succeeding sub-regulation(5):

Provided that for ascertaining income tax benefits on account of accelerated depreciation for the purpose of tariff determination-

- (a) assessment of benefit shall be based on normative capital cost or the cost admitted, as the case may be, accelerated depreciation rate, as per relevant provisions under the Income Tax Act and the Corporate Tax rate;
- (b) in case of generic levelled tariff, capitalisation of renewable energy projects shall be considered during second half of the financial year and in case of project specific levelled tariff, the expected date of commencement of operation of the project shall be considered;
- (c) per unit benefit shall be derived on levelled basis at the discount factor equivalent to the post tax weighted average cost of capital.

(5) It shall be assumed that the renewable energy generator shall avail the benefit of accelerated depreciation and accordingly the tariff, which accounts for the accelerated depreciation, shall be applicable unless the renewable energy generator establishes, to the satisfaction of the distribution licensee, that he has not availed or is not entitled to such a benefit.”

5.16 For the purpose of determining the accelerated depreciation benefits, the methodology of CERC has been adopted for calculations of AD benefit by comparing the depreciation @ 5.28% as per straight line method with depreciation as per Income Tax rate which, for the FY 2017-18, is 40% on written down value basis. Moreover, additional 20% depreciation as extended to new assets acquired by power generation companies vide amendment in section 32, sub-section (1) clause (ii a) of the Income Tax Act has also been considered in initial two years. The tax benefit on this account has been computed at applicable Income Tax rate @ 34.61 % (30% IT rate +12% surcharge+3% education cess). As the project is considered to be capitalized during the second half of the financial year as per clause (b) of sub-regulation (4) of regulation 21 of RE Tariff Regulations, the depreciation for the first year has been calculated at the rate of 50% of the capital cost. Income Tax benefit has been worked out as per normal tax rate on the net depreciation benefit. Per unit levelled accelerated depreciation benefit has been computed by considering the post tax weighted average cost of capital at the discount factor as per para-5.14.

6. Generic Levelled Tariffs and Associated Terms & Conditions.-

In light of the discussions made in the preceding paragraphs, the generic levelled tariffs and the associated terms and conditions for solar PV power plants falling under the RE Tariff Regulations, 2012 in respect of the period 01.04.2017 to 30.09.2017 forming part of FY 2017-18 have been computed as under:-

A. The generic levelled tariffs for Solar PV power plants in respect of the said period shall be as under:

Capacity	Without availing AD benefit (Rs. Per kWh)	With AD benefit (Rs. Per kWh)	Effect of AD (Rs. Per kWh)
Upto 1.00 MW	4.85	4.37	0.48
Above to 1.00 MW to 5.00 MW	4.79	4.31	0.48

- B. These tariffs shall be subject to the RE Tariff Regulations, 2012 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. Save as provided in the **Part-C** of para-11 of this order and Power Purchase Agreement(PPA), these tariffs shall be applicable in cases where the following conditions are met:-
- the joint petition for approval of PPA has been submitted to the Commission on or after 01.04.2017 , but not later than 30.09.2017; and
 - such project is commissioned on or before 31.03.2019.
- E. 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.
- F. These tariffs shall not be applicable in case of the solar PV plants which are installed by the consumers within their premises (rooftop or ground mounted) under net metering scheme.
7. The detailed computations for generic levellised tariffs for categories of solar PV power plants for FY 2017-18 as well as illustrations thereof are attached as Appendix – “I” & “II”.

Part-B:-

Generic levellised tariffs for Solar PV Projects for FY 2017-18 under RE Tariff Regulations, 2017 applicable from 01.10.2017 to 31.03.2018.-

The generic levellised tariffs and associated terms and conditions for various categories of solar PV projects in respect the period 01.10.2017 to 31.03.2018 forming part of FY 2017-18 have been computed in accordance with the RE Tariff Regulations, 2017 as discussed in the following paragraphs:-

- The Commission notified the RE Tariff Regulations, 2017, which have come into force from 1st October, 2017. The regulation 18 of the RE Tariff Regulations, 2017, provides that:-
 - “18 (1).....xxxxxxxxxxxx.....
 - Where the technological specific parameters and other terms and conditions, including the tariff period and useful life of the project, have not been specified, the Commission may, by an order, at any time and at such intervals as it considers appropriate to do so, fix the same:
Provided that.....xxxxxxxx.....

Provided further that the Commission may, by order, categorise the renewable energy projects, other than small hydro projects, under the respective renewable energy technologies specified in sub-regulation (1), based on the capacity of projects, the available subsidy schemes and such other factors as may be considered appropriate by it:

Provided further 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 MW for any such technology, any or all of the technological specific parameters, including capital cost, and other terms and conditions or the tariff, in respect of the relevant part of the control period for the relevant renewable energy technology, as it may deem fit -

- (a) as specified or adopted by the Central Commission for determining project specific tariff for any project(s) or generic levellised tariff for any category of project(s); or
- (b) the rate discovered through competitive bidding undertaken by any Government agency; or
- (c) the inputs available from any other sources, as the Commission may find appropriate:

Provided further that the financial norms, except for capital cost, as specified under Chapter-IV of these Regulations shall also be considered as ceiling norms.

(3) The Commission may, after having fixed the norms/parameters and other related terms and conditions as per sub-regulation (2), determine, or otherwise fix, by order, either generic levellised tariff(s) for any or all categories of such renewable energy technology(ies):

Provided that the Commission may, by order, fix, at such time intervals as it may consider appropriate, the ceiling rates and associated terms and conditions to be used by the licensee for reverse bidding for procurement of power from the projects based on such technologies.

(4)xxxxxxxxxxxxx..... .

(5)xxxxxxxxxxxxx..... .

2. Categorization.-

In view of above provisions contained in regulation 18 of the RE Tariff Regulations, 2017, the Commission categorizes the solar PV projects and also considered the technological specific norms and generic levellised tariff for procurement of power by the distribution licensee from solar PV plants which is detailed in the succeeding paragraphs.

3. 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 feels that in view of the geographical and topographical conditions in the State and in order to promote smaller capacities of solar PV plants at different locations across the State, it may be appropriate to create a separate category of solar PV projects upto 1.00 MW capacity. The capacity of such projects in the second category is proposed to be limited to 5.00 MW as the Commission expects 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. All

the solar PV projects with a capacity of more than 5.00 MW shall accordingly fall under the third category. The Commission after taking into account various related factors, categorized these projects vide its Order 06.07.2016. The Commission retains similar categorization for the solar PV generation capacity for the purposes of normative capital cost and determination of levelled tariffs for the period under consideration as well under the RE Tariff Regulation, 2017. Accordingly, the solar PV projects are categorized as under:-

Capacity	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

4. 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 their RE Regulations, 2017 i.e. Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination for Renewable Energy Sources) Regulations, 2017 (hereinafter referred as "CERC RE Tariff Regulations, 2017. The Central Commission has specified the technological parameters i.e. normative Capacity Utilization Factor (CUF) for solar PV projects as 19%, normative auxiliary consumption as 0.25% of gross generation. However, for capital cost and O&M expenses, the CERC RE Tariff Regulations, 2017 provides that for these parameters, only project specific parameter(s), based on prevailing market trends, are taken into consideration.

For FY 2017-18, the CERC has not made any provision for determination of normative (benchmark) capital cost for solar PV projects and its RE Tariff Regulations, 2017 do not envisage such a generic tariff determination. Accordingly, the Commission evolves its own technology specific parameters after taking into account the various available inputs, including those notified by CERC for FY 2016-17.

4.1 Capital Cost.-

The Commission considered the normative capital cost, as already considered in part-A of this order, for solar PV projects for the period under consideration as well. Accordingly, the normative cost for the period under consideration, under the RE Tariff Regulations, 2017 is considered as under:-

Sr. No.	Capacity of Solar PV Project at one site	Normative Capital Cost (Rs. Lakh. Per MW)
1	Above 1 MW to 5 MW capacity	446.00
2	Upto 1 MW capacity	452.70

4.2 Operation and Maintenance Expenses.-

The O&M expenses of Rs. 7.40 Lakh/MW, as considered and elaborated in para-4.2 of part-A of this order based on the discussions therein, is considered for the period under consideration as well as under the RE Tariff Regulations, 2017. These normative O&M charges shall also be escalated at the rate 5.72% per annum over the tariff period as per the RE Tariff Regulations, 2017.

4.3 Normative Net Saleable Energy.-

The CERC RE Tariff Regulations, 2017 provides that the annual normative Capacity Utilization Factor (CUF) of solar PV plant shall be 19%. The Commission adopts this norm on net basis. Accordingly no deduction shall be made on account of auxiliary consumptions etc. However the annual net saleable energy shall be worked out on normative basis by considering energy losses @ 0.7% of the generation, to cover the losses on the project line upto the interconnection point on normative basis and the annual CUF of 19%. No other deduction, except Govt. supply on account royalty power etc. if any, shall be made to arrive at the net saleable energy on normative basis.

4.4 The other technological specific parameters i.e. 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 RE Regulations also and the same are considered accordingly.

5. After having fixed the technological specific parameters as above, the Commission now determines the generic levelled tariffs, based on the provisions of RE Tariff Regulations, 2017 for solar PV projects for the period 01.10.2017 to 31.03.2018 forming part of FY 2017-18 under regulation 18 of the RE Tariff Regulations, 2017. The main details of the tariffs are as follows:-

5.1 Tariff Structure.-

Regulation 12 of the RE Tariff Regulations, 2017, stipulates that single part levelled tariff structure 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 levelled tariffs have been worked out for the respective categories of solar PV projects by adopting the methodology, discussed in succeeding paragraphs.

5.2 Technology Specific Parameters.-

The normative parameters for capital cost, O&M charges, CUF, applicability of tariff as discussed in para 4.0 above, have been followed.

5.3 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 and tariff period has been taken as 25 years which is also in line with CERC RE Tariff Regulations, 2017.

5.4 Debt Equity Ratio.-

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

5.5 Return on Equity.-

Regulation 26 of the RE Tariff Regulations, 2017, provides that the value base for the equity shall be 30% of the normative capital cost as determined under regulation 21 and that the normative return on equity shall be 17% per annum on pre-tax basis and shall not be subject to any adjustment on account of any taxes, or changes in the tax rates, under Income Tax Act.

5.6 Interest on Loan.-

- (i) The sub-regulation (1) of regulation 24 of the RE Tariff Regulation, 2017 provides that the loan tenure of 13 years, inclusive of moratorium period, if any, is to 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 loans arrived at in the manner indicated in the regulation 23 shall be considered as gross normative loan for calculation for interest on loan. The normative loan outstanding as on 1st April of every year shall be worked out by deducting the cumulative repayment upto 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), or the respective generic levelled tariffs are to be made applicable, shall be considered:

Provided that in case where 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.”

- (ii) In view of above, interest rate of 10.00% per annum has been worked out by the adding 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 the date of commencement of the RE Tariff Regulations, 2017, as shown in the table below:-

Month	Tenor-wise MCLR of SBI
April, 2017	8.00
May, 2017	8.00
June, 2017	8.00
July, 2017	8.00
August, 2017	8.00
September, 2017	8.00
Avg. for last available 6 months.	8.00

5.7 Depreciation.-

(i) Regulation 25 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 the normative capital cost (for generic tariff) or the capital cost of the project as admitted by the Commission (for project specific tariff), as the case may be;

(b) the salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset;

(c) depreciation per annum shall be based on ‘Differential Depreciation Approach’. For tariff purposes, the depreciation shall be allowed @ 5.28% per annum till such time the requirement for repayment of loan component of the capital cost as per regulations 21, 23 and 24 after adjusting the amount of subsidy as per regulation 22, 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.”

(ii) In accordance with the above, the rate of depreciation has been considered as 5.28% per annum for meeting the requirements of loan repayment and balance amount of depreciation has been equally spread over the remaining tariff period. For the year in which the loan gets totally repaid, the depreciation has been provided to the extent of the actual requirement for loan repayment or the average value of balance period whichever is higher.

5.8 No adjustment has been made on account of subsidy in the tariff calculations and as such the rate of depreciation for the first 13 years has been considered as 5.28% and the rate of depreciation from the 13th 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 13 years (%)	5.28%
Rate of depreciation after first 13 years (%)	1.78%

5.9 Interest on Working Capital.-

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

- “(a) operation and maintenance expenses for one month;
- (b) receivables equivalent to 2 (two) months 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 as 11.00% per annum has been worked out by the adding 300 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 the date of commencement of the RE Tariff Regulations, 2017.

5.10 Subsidy or Incentive or Grant/Budgetary Support by the Central/State Government.-

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

“(1) While determining the generic levelled or project specific levelled 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 its agencies, but excluding accelerated depreciation benefit under the Income Tax Act:

Provided that for tariff determination, only 75% of the capital subsidy available to the project as per applicable scheme of the MNRE/State Government shall be considered:

Provided further that the Commission may evolve suitable mechanism(s) for incorporating impact of the subsidy component for determination or adjustment of generic levelled tariffs for various categories of projects:

Provided further that the capital subsidy under the schemes of the Central or State Government or its agencies, shall, unless the circumstances otherwise warrant, be ordinarily adjusted in the middle of first 12 months from the commencement of the tariff period against the principal component of the loan amount as additional reduction apart from the normal payment:

.....xxxxxx.....”

(ii) In accordance with sub-regulation (3) of regulation 22 of RE Tariff Regulations, 2017, the amount of subsidy shall be considered for each renewable source as per the applicable policy of the MNRE/State Government and if the amount and/or mechanism of subsidy is changed by the MNRE/State Government, consequent corrections in tariffs may be carried out by the Commission in accordance with regulation 20 of the RE Tariff Regulations, 2017.

5.11 No capital subsidy or incentive or grant /budgetary support have been considered in the proposed calculations. In case, a solar PV project is entitled to any incentive and/or subsidy and/or grant available, subsidy/budgetary support/ grant/ generation based incentive (GBI)/ viability gap funding (VGF), under the schemes of the Central or State Government or their agencies, the same shall be adjusted by the distribution licensee, at the time of signing the PPA, as per regulation 22 of RE tariff Regulations, 2017. The benefit, if any, on

account of AD is however not to be considered as provided with RE Regulations, 2017.

5.12 **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 is to be considered for the purpose of levelled tariff computation. The discount factor has been calculated on this basis by following the normative debt equity ratio (70:30). For this purpose, the interest rate for the loan component (i.e. 70%) of capital cost has been considered as 10.00% which has been adjusted for the corporate tax. For equity component (i.e. 30% of the capital cost) the post tax RoE has been computed as 13.56% by adjusting the normative RoE of 17.00% per annum with average of MAT rate as per CERC RE Tariff Order for FY 2017-18 i.e. 20.26% per annum. The discounted factor has been calculated as 8.64%. The Corporate tax has been taken as 34.61% (30% IT rate+ 12% Surcharge+ 3% Education cess).

6. **Generic Levelled Tariffs and Associated Terms & Conditions.-**

In light of the discussions made in the preceding paragraphs, the generic levelled tariffs and the associated terms and conditions for solar PV power plant in respect of the period 01.10.2017 to 31.03.2018 forming part of FY 2017-18 under the RE Regulations, 2017 have been arrived as under:-

A. The generic levelled tariffs for Solar PV power plants in respect of FY 2017-18 shall be as under:

Capacity	Generic levelled tariff (Rs. Per kWh)
Upto 1.00 MW	4.31
Above to 1.00 MW to 5.00 MW	4.25

B. These tariffs 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. Save as provided in the **Part-C** of para11 of this order and the Power Purchase Agreement (PPA), these tariffs shall be applicable in cases where the following condition are met:-

- (i) the joint petition for approval of PPA has been submitted to the Commission on or after 01.10.2017 , but not later than 31.03.2018; and
- (ii) such project is commissioned on or before 31.03.2019.

E. 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.

- F. These tariffs shall not be applicable in case of the solar PV plants which are installed by the consumers within their premises (rooftop or ground mounted) under net metering scheme.
8. The detailed computations for generic levelled tariffs for categories of solar PV power plants for FY 2017-18 as well as illustrations thereof are attached as Appendix – “III & IV”.

Part-C:-

Generic levelled tariffs for Solar PV Projects For FY 2017-18 for the purpose of implementation of the PPA provision in cases of slippage in commissioning of the projects.-

In situations where the rate for FY 2017-18 is to be considered in cases involving slippage in commissioning of the projects, in accordance with the provision in the PPA, the tariff (with AD benefit) computed under **Part-A** of this order, being higher than the tariff computed under **Part-B** of this order shall be considered as the rate for FY 2017-18 for the limited purpose of arriving at the reduced rate actually payable in the slippage cases, as per the provisions of PPA.

Sd/-
(Bhanu Pratap Singh)
Member

Sd/-
(S.K.B.S. Negi)
Chairman

Assumption Parameters for Solar PV Power Projects upto 1 MW

Sr. No	Assumption Head	Sub Head	Sub Head(2)	Unit	Value
1	Power Generation	Capacity	Installed Generation Capacity	KW	1000
			Capacity Utilisation Factor	%	0.19
			Auxiliary Consumption	%	0
			Transmission losses	%	0.7
			Useful Life	%	25
2	Project Cost	Capital Cost /MW	Project Cost	Rs. Lacs/MW	452.7
3	Project Financing	Debt Equity	Tariff Period	Year	25
			Debt	%	70
			Equity	%	30
		Debt Component	Loan Amount	Rs. Lacs/MW	316.89
			Moratorium Period	Year	0
			Repayment Period	Year	12
			Interest Rate	%	12.3
		Equity Component	Equity Amount	Rs. Lacs/MW	135.81
			Return of equity for first 10 Years	%	19
Return of equity from 11th Years onwards	%		22		
4	Subsidy	Subsidy			0
5	Depreciation	Depreciation	Recovery of Depreciation	%	90
			Annual Rate of Depreciation till completion of Loan Repayment (balance spread in remaining years) 13th year Onward	%	5.83
6	Operation & Maintenance		Total O&M Expenses	Rs. Lacs/MW	7.4
			Annual Escalation	%	5.72
7	Working Capital		O&M Charges	Months	1
			Maintenance Spares	% of O&M expenses of a Year	15
			Receivables	Months	2
			Interest on Working capital	%	12.80
8	Accelerated Depreciation	Accelerated Depreciation	Book Depreciation	%	5.28
			Tax Depreciation	%	40
			Additional Depreciation	%	20
			Corporate Tax including Surcharge & Cess	%	34.61
9	Discount Factor		Discount Rate	%	10.04

		Determination of Tariff for Solar PV Power Projects up to 1 MW																				1st 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		1.664	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	
Losses	MU		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Net Generation	MU		1.653	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	
Fixed Cost		year																										
O&M Expences	Rs lacs		7.40	7.823	8.27	8.74	9.24	9.77	10.33	10.92	11.55	12.21	12.91	13.64	14.43	15.25	16.12	17.04	18.02	19.05	20.14	21.29	22.51	23.80	25.16	26.60	28.12	
Depriciation	Rs lacs		26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	26.39	6.97	6.97	6.97	6.97	6.97	6.97	6.97	6.97	6.97	6.97	6.97	6.97	6.97	6.97
Interest on Term Loan	Rs lacs		37.35	34.11	30.86	27.61	24.36	21.11	17.86	14.62	11.37	8.12	4.87	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capi	Rs lacs		2.34	2.29	2.24	2.20	2.15	2.11	2.07	2.03	1.99	1.95	2.01	1.98	1.56	1.60	1.65	1.69	1.75	1.80	1.86	1.92	1.98	2.05	2.12	2.19	2.27	
Return on Equity	Rs lacs		25.80	25.80	25.80	25.80	25.80	25.80	25.80	25.80	25.80	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88	29.88
Total fixed Cost	Rs lacs		99.29	96.42	93.57	90.75	87.95	85.19	82.46	79.76	77.10	74.48	76.06	73.52	52.83	53.70	54.62	55.59	56.62	57.70	58.85	60.06	61.34	62.70	64.13	65.64	67.24	
Levellised CoG																												
Per unit CoG	Unit	levellised																										
O&M Expences	Rs/kWh	0.72	0.45	0.47	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.15	1.22	1.29	1.36	1.44	1.52	1.61	1.70	
Depriciation	Rs/kWh	1.30	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	1.60	0.42	0.42	0.42	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	1.05	2.26	2.06	1.87	1.67	1.47	1.28	1.08	0.88	0.69	0.49	0.29	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on Working Capi	Rs/kWh	0.13	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14
Return on Equity	Rs/kWh	1.64	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	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	
Total CoG	Rs/kWh	4.85	6.01	5.8336	5.66	5.49	5.32	5.15	4.99	4.83	4.67	4.51	4.60	4.45	3.20	3.25	3.30	3.36	3.43	3.49	3.56	3.63	3.71	3.79	3.88	3.97	4.07	
Discounted factor	%		1	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.38	0.35	0.32	0.29	0.26	0.24	0.22	0.20	0.18	0.16	0.15	0.13	0.12	0.11	0.10	
levellised Tariff	Rs/kWh	4.85	6.01	5.3014	4.68	4.12	3.63	3.19	2.81	2.47	2.17	1.90	1.77	1.55	1.01	0.94	0.87	0.80	0.74	0.69	0.64	0.59	0.55	0.51	0.47	0.44	0.41	

Determination of Accelerated Depreciation Benefit for Solar PV Power Projects above 1 MW upto 5 MW																					2nd Sheet of Appendix I					
Years	Units	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
Depreciation Amount	90%																									
Book Depreciation Rate	5.28%																									
Tax Depreciation Rate	40%																									
Additional Depreciation	20%																									
Income Tax (Normal rate)	34.61%																									
Capital cost (In Lacs)	452.7																									
Book Depreciation	%	2.64	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	2.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Book Depreciation	Rs Lacs	11.95	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	13.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accelerated Depreciation opening	%	100	50	5.00	1.00	0.20	0.04	0.01	0.00																	
Allowed during the Year	%	50	45	4	0.8	0.16	0.03	0.01																		
Closing	%	50	5	1	0.2	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accelerated Depreciation	Rs Lacs	226.35	203.72	18.11	3.62	0.72	0.14	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciation Benefit	Rs Lacs	214.40	179.81	-5.79	-20.28	-23.18	-23.77	-23.86	-23.90	-23.90	-23.90	-23.90	-23.90	-23.90	-23.90	-23.90	-23.90	-23.90	-13.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lacs	74.20	62.23	-2.01	-7.02	-8.02	-8.23	-8.26	-8.27	-8.27	-8.27	-8.27	-8.27	-8.27	-8.27	-8.27	-8.27	-8.27	-4.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy Generation	MU	0.826	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653
Discounting factor		1	0.95	0.87	0.79	0.72	0.65	0.59	0.54	0.49	0.44	0.40	0.37	0.33	0.30	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.12	0.11
Per Unit Energy Generation Benefit		8.98	3.77	-0.12	-0.42	-0.49	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.50	-0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounted Net Depreciation Benefit	Rs Lacs	214.40	171.61	-5.03	-15.98	-16.60	-15.47	-14.11	-12.85	-11.68	-10.61	-9.64	-8.76	-7.96	-7.24	-6.58	-5.98	-5.43	-2.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounted Tax Benefit	Rs Lacs	74.20	59.39	-1.74	-5.53	-5.75	-5.35	-4.88	-4.45	-4.04	-3.67	-3.34	-3.03	-2.76	-2.50	-2.28	-2.07	-1.88	-0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounted Energy Generation	MU	0.826	1.577	1.433	1.303	1.184	1.076	0.978	0.888	0.807	0.734	0.667	0.606	0.551	0.500	0.455	0.413	0.376	0.341	0.310	0.282	0.256	0.233	0.212	0.192	0.175
Discounted Per Unit Energy Generation Benefit		8.98	3.59	-0.11	-0.33	-0.35	-0.32	-0.30	-0.27	-0.24	-0.22	-0.20	-0.18	-0.17	-0.15	-0.14	-0.13	-0.11	-0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Levellised Benefit
Levellised Tax benefit 7.6285
Levellised Energy Generation in M 1.5733
Levellised Benefit Rs/kWh 0.48

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

Sr. No	Assumption Head	Sub Head	Sub Head(2)	Unit	Value
1	Power Generation	Capacity	Installed Generation Capacity	KW	1000
			Capacity Utilisation Factor	%	0.19
			Auxiliary Consumption	%	0
			Transmission losses	%	0.7
			Useful Life	%	25
2	Project Cost	Capital Cost /MW	Project Cost	Rs. Lacs/MW	446
3	Project Financing	Debt Equity	Tariff Period	Year	25
			Debt	%	70
			Equity	%	30
		Debt Component	Loan Amount	Rs. Lacs/MW	312.2
			Moratorium Period	Year	0
			Repayment Period	Year	12
			Interest Rate	%	12.30
		Equity Component	Equity Amount	Rs. Lacs/MW	133.8
			Return of equity for first 10 Years	%	19
Return of equity from 11th Years onwards	%		22		
4	Subsidy	Subsidy			0
5	Depreciation	Depreciation	Recovery of Depreciation	%	90
			Annual Rate of Depreciation till completion of Loan Repayment (balance spread in remaining years) 13th year Onward	%	5.83
6	Operation & Maintenance		Total O&M Expenses	Rs. Lacs/MW	7.40
			Annual Escalation	%	5.72
7	Working Capital		O&M Charges	Months	1
			Maintenance Spares	% of O&M expenses of a Year	15
			Receivables	Months	2
			Interest on Working capital	%	12.80
8	Accelerated Depreciation	Accelerated Depreciation	Book Depreciation	%	5.28
			Tax Depreciation	%	40
			Additional Depreciation	%	20
			Corporate Tax including Surcharge & Cess	%	34.61
9	Discount Factor		Discount Rate	%	10.04

		Determination of Tariff for Solar PV Power Projects above 1 MW upto 5 MW																				1st Sheet 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		1.664	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	
Losses	MU		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Net Generation	MU		1.653	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	
Fixed Cost		year																										
O&M Expences	Rs lacs		7.40	7.823	8.27	8.74	9.24	9.77	10.33	10.92	11.55	12.21	12.91	13.64	14.43	15.25	16.12	17.04	18.02	19.05	20.14	21.29	22.51	23.80	25.16	26.60	28.12	
Depriciation	Rs lacs		26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	26.00	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87	6.87
Interest on Term Loan	Rs lacs		36.80	33.60	30.40	27.20	24.00	20.80	17.60	14.40	11.20	8.00	4.80	1.60	0.00	0.00	0.00	0.00	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		2.31	2.26	2.22	2.17	2.13	2.09	2.05	2.01	1.97	1.93	1.99	1.96	1.55	1.59	1.63	1.68	1.73	1.79	1.85	1.91	1.97	2.04	2.11	2.18	2.26	
Return on Equity	Rs lacs		25.42	25.42	25.42	25.42	25.42	25.42	25.42	25.42	25.42	25.42	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44	29.44
Total fixed Cost	Rs lacs		97.93	95.11	92.31	89.54	86.80	84.08	81.40	78.75	76.14	73.57	75.13	72.64	52.28	53.14	54.06	55.03	56.06	57.14	58.29	59.50	60.78	62.14	63.57	65.09	66.69	
Levellised CoG																												
Per unit CoG	Unit	levellised																										
O&M Expences	Rs/kWh	0.72	0.45	0.47	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.15	1.22	1.29	1.36	1.44	1.52	1.61	1.70	
Depriciation	Rs/kWh	1.29	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	1.57	0.42	0.42	0.42	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	1.04	2.23	2.03	1.84	1.65	1.45	1.26	1.06	0.87	0.68	0.48	0.29	0.10	0.00	0.00	0.00	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	0.12	0.14	0.14	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.09	0.10	0.10	0.10	0.10	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.14	
Return on Equity	Rs/kWh	1.62	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.54	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	
Total CoG	Rs/kWh	4.79	5.93	5.7547	5.59	5.42	5.25	5.09	4.93	4.76	4.61	4.45	4.55	4.40	3.16	3.22	3.27	3.33	3.39	3.46	3.53	3.60	3.68	3.76	3.85	3.94	4.03	
Discounted factor	%		1	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.38	0.35	0.32	0.29	0.26	0.24	0.22	0.20	0.18	0.16	0.15	0.13	0.12	0.11	0.10	
levellised Tariff	Rs/kWh	4.79	5.93	5.2296	4.61	4.07	3.58	3.15	2.77	2.44	2.14	1.88	1.75	1.53	1.00	0.93	0.86	0.79	0.73	0.68	0.63	0.58	0.54	0.50	0.47	0.44	0.41	

Determination of Accelerated Depreciation Benefit for Solar PV Power Projects above 1 MW upto 5 MW																2nd Sheet of Appendix-II										
Years	Units	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
Depreciation Amount	90%																									
Book Depreciation Rate	5.28%																									
Tax Depreciation Rate	40%																									
Additional Depreciation	20%																									
Income Tax (Normal rate)	34.61%																									
Capital cost (In Lacs)	446																									
Book Depreciation	%	2.64	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	5.28	2.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Book Depreciation	Rs Lacs	11.77	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	12.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accelerated Depreciaton opening	%	100	50	5.00	1.00	0.20	0.04	0.01	0.00																	
Allowed during the Year	%	50	45	4	0.8	0.16	0.03	0.01																		
Closing	%	50	5	1	0.2	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Accelerated Depreciaton	Rs Lacs	223.00	200.70	17.84	3.57	0.71	0.13	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Depreciaton Benefit	Rs Lacs	211.23	177.15	-5.71	-19.98	-22.84	-23.42	-23.50	-23.55	-23.55	-23.55	-23.55	-23.55	-23.55	-23.55	-23.55	-23.55	-23.55	-12.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lacs	73.11	61.31	-1.98	-6.92	-7.90	-8.10	-8.13	-8.15	-8.15	-8.15	-8.15	-8.15	-8.15	-8.15	-8.15	-8.15	-8.15	-4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy Generation	MU	0.826	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653	1.653
Discounting factor from assumption		1	0.91	0.83	0.75	0.68	0.62	0.56	0.51	0.47	0.42	0.38	0.35	0.32	0.29	0.26	0.24	0.22	0.20	0.18	0.16	0.15	0.13	0.12	0.11	0.10
Discounting factor		1	0.95	0.87	0.79	0.72	0.65	0.59	0.54	0.49	0.44	0.40	0.37	0.33	0.30	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.12	0.11
Per Unit Energy Generation Benefit		8.85	3.71	-0.12	-0.42	-0.48	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.49	-0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounted Net Depreciaton Benefit	Rs Lacs	211.23	169.07	-4.95	-15.75	-16.36	-15.24	-13.90	-12.66	-11.50	-10.45	-9.50	-8.63	-7.85	-7.13	-6.48	-5.89	-5.35	-2.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DiscountedTax Benefit	Rs Lacs	73.11	58.51	-1.71	-5.45	-5.66	-5.27	-4.81	-4.38	-3.98	-3.62	-3.29	-2.99	-2.72	-2.47	-2.24	-2.04	-1.85	-0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
DiscountedEnergy Generation	MU	0.826	1.577	1.433	1.303	1.184	1.076	0.978	0.888	0.807	0.734	0.667	0.606	0.551	0.500	0.455	0.413	0.376	0.341	0.310	0.282	0.256	0.233	0.212	0.192	0.175
Discounted Per Unit Energy Generation Benefit		8.85	3.54	-0.10	-0.33	-0.34	-0.32	-0.29	-0.27	-0.24	-0.22	-0.20	-0.18	-0.16	-0.15	-0.14	-0.12	-0.11	-0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Levellised Benefit
Levellised Tax benefit **7.51563**
Levellised Energy Generation in MU **1.57335**
Levellised Benefit Rs/kWh **0.48**

Assumption Parameters for Solar PV Power Projects upto 1 MW

Sr. No	Assumption Head	Sub Head	Sub Head(2)	Unit	Value
1	Power Generation	Capacity	Installed Generation Capacity	KW	1000
			Capacity Utilisation Factor	%	0.19
			Auxiliary Consumption	%	0
			Transmission losses	%	0.7
			Useful Life	%	25
2	Project Cost	Capital Cost /MW	Project Cost	Rs. Lacs/MW	452.7
3	Project Financing	Debt Equity	Tariff Period	Year	25
			Debt	%	70
		Debt Component	Equity	%	30
			Loan Amount	Rs. Lacs/MW	316.89
			Moratorium Period	Year	0
			Repayment Period	Year	12
		Equity Component	Interest Rate	%	10.00
			Equity Amount	Rs. Lacs/MW	135.81
			Return of equity for first 10 Years	%	17
Return of equity from 11th Years onwards	%		17		
4	Subsidy	Subsidy			0
5	Depreciation	Depreciation	Recovery of Depreciation	%	90
			Annual Rate of Depreciation till completion of Loan Repayment (balance spread in remaining years) 14th year Onward	%	5.28
6	Operation & Maintenance		Total O&M Expenses	Rs. Lacs/MW	7.4
			Annual Escalation	%	5.72
7	Working Capital		O&M Charges	Months	1
			Maintenance Spares	% of O&M expenses of a Year	15
			Receivables	Months	2
			Interest on Working capital	%	11.00
9	Discount Factor		Discount Rate	%	8.65

		Determination of Tariff for Solar PV Power Projects up to 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		1.664	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	
Losses	MU		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Net Generation	MU		1.653	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	
Fixed Cost		year																										
O&M Expences	Rs lacs		7.40	7.823	8.27	8.74	9.24	9.77	10.33	10.92	11.55	12.21	12.91	13.64	14.43	15.25	16.12	17.04	18.02	19.05	20.14	21.29	22.51	23.80	25.16	26.60	28.12	
Depriciation	Rs lacs		23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	23.90	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06	8.06
Interest on Term Loan	Rs lacs		30.47	28.03	25.59	23.16	20.72	18.28	15.84	13.41	10.97	8.53	6.09	3.66	1.22	0.00	0.00	0.00	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		1.78	1.75	1.73	1.70	1.68	1.66	1.64	1.62	1.60	1.58	1.57	1.56	1.55	1.27	1.30	1.35	1.39	1.44	1.48	1.54	1.59	1.65	1.71	1.77	1.84	
Return on Equity	Rs lacs		23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09	23.09
Total fixed Cost	Rs lacs		86.64	84.60	82.58	80.59	78.63	76.70	74.80	72.94	71.11	69.31	67.56	65.85	64.18	47.66	48.57	49.54	50.55	51.63	52.77	53.97	55.25	56.59	58.01	59.52	61.11	
Levellised CoG																												
Per unit CoG	Unit	levellised																										
O&M Expences	Rs/kWh	0.75	0.45	0.47	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.15	1.22	1.29	1.36	1.44	1.52	1.61	1.70	
Depriciation	Rs/kWh	1.21	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	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	
Interest on Term Loan	Rs/kWh	0.85	1.84	1.70	1.55	1.40	1.25	1.11	0.96	0.81	0.66	0.52	0.37	0.22	0.07	0.00	0.00	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	0.10	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	
Return on Equity	Rs/kWh	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	
Total CoG	Rs/kWh	4.31	5.24	5.1186	5.00	4.88	4.76	4.64	4.53	4.41	4.30	4.19	4.09	3.98	3.88	2.88	2.94	3.00	3.06	3.12	3.19	3.27	3.34	3.42	3.51	3.60	3.70	
Discounted factor	%		1	0.92	0.85	0.78	0.72	0.66	0.61	0.56	0.51	0.47	0.44	0.40	0.37	0.34	0.31	0.29	0.27	0.24	0.22	0.21	0.19	0.18	0.16	0.15	0.14	
levellised Tariff	Rs/kWh	4.31	5.24	4.7111	4.23	3.80	3.41	3.07	2.75	2.47	2.22	1.99	1.78	1.60	1.43	0.98	0.92	0.86	0.81	0.76	0.72	0.68	0.64	0.60	0.57	0.53	0.50	

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

Sr. No	Assumption Head	Sub Head	Sub Head(2)	Unit	Value
1	Power Generation	Capacity	Installed Generation Capacity	KW	1000
			Capacity Utilisation Factor	%	0.19
			Auxiliary Consumption	%	0
			Transmission losses	%	0.7
			Useful Life	%	25
2	Project Cost	Capital Cost /MW	Project Cost	Rs. Lacs/MW	446
3	Project Financing	Debt Equity	Tariff Period	Year	25
			Debt	%	70
			Equity	%	30
		Debt Component	Loan Amount	Rs. Lacs/MW	312.2
			Moratorium Period	Year	0
			Repayment Period	Year	12
			Interest Rate	%	10.00
		Equity Component	Equity Amount	Rs. Lacs/MW	133.8
			Return of equity for first 10 Years	%	17
Return of equity from 11th Years onwards	%		17		
4	Subsidy	Subsidy			0
5	Depreciation	Depreciation	Recovery of Depreciation	%	90
			Annual Rate of Depreciation till completion of Loan Repayment (balance spread in remaining years)	%	5.28
			14th year Onward	%	1.78
6	Operation & Maintenance		Total O&M Expenses	Rs. Lacs/MW	7.40
			Annual Escalation	%	5.72
7	Working Capital		O&M Charges	Months	1
			Maintenance Spares	% of O&M expenses of a Year	15
			Receivables	Months	2
			Interest on Working capital	%	11.00
9	Discount Factor		Discount Rate	%	8.65

		Determination of Tariff for Solar PV Power Projects above 1 MW upto 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		1.664	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66	
Losses	MU		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Net Generation	MU		1.653	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	
Fixed Cost		year																										
O&M Expences	Rs lacs		7.40	7.823	8.27	8.74	9.24	9.77	10.33	10.92	11.55	12.21	12.91	13.64	14.43	15.25	16.12	17.04	18.02	19.05	20.14	21.29	22.51	23.80	25.16	26.60	28.12	
Depriciation	Rs lacs		23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	23.55	7.94	7.94	7.94	7.94	7.94	7.94	7.94	7.94	7.94	7.94	7.94	7.94	7.94
Interest on Term Loan	Rs lacs		30.02	27.62	25.22	22.81	20.41	18.01	15.61	13.21	10.81	8.41	6.00	3.60	1.20	0.00	0.00	0.00	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		1.76	1.73	1.71	1.68	1.66	1.64	1.62	1.60	1.58	1.57	1.56	1.54	1.53	1.26	1.30	1.34	1.38	1.43	1.48	1.53	1.58	1.64	1.70	1.77	1.83	
Return on Equity	Rs lacs		22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75	22.75
Total fixed Cost	Rs lacs		85.47	83.47	81.49	79.54	77.61	75.72	73.86	72.03	70.23	68.48	66.76	65.09	63.45	47.19	48.10	49.07	50.09	51.16	52.30	53.50	54.78	56.12	57.54	59.05	60.64	
Levellised CoG																												
Per unit CoG	Unit	levellised																										
O&M Expences	Rs/kWh	0.75	0.45	0.47	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.87	0.92	0.98	1.03	1.09	1.15	1.22	1.29	1.36	1.44	1.52	1.61	1.70	
Depriciation	Rs/kWh	1.19	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	
Interest on Term Loan	Rs/kWh	0.84	1.82	1.67	1.53	1.38	1.24	1.09	0.94	0.80	0.65	0.51	0.36	0.22	0.07	0.00	0.00	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	0.10	0.11	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	
Return on Equity	Rs/kWh	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38	
Total CoG	Rs/kWh	4.25	5.17	5.0502	4.93	4.81	4.70	4.58	4.47	4.36	4.25	4.14	4.04	3.94	3.84	2.86	2.91	2.97	3.03	3.10	3.16	3.24	3.31	3.40	3.48	3.57	3.67	
Discounted factor	%		1	0.92	0.85	0.78	0.72	0.66	0.61	0.56	0.51	0.47	0.44	0.40	0.37	0.34	0.31	0.29	0.27	0.24	0.22	0.21	0.19	0.18	0.16	0.15	0.14	
levellised Tariff	Rs/kWh	4.25	5.17	4.6481	4.18	3.75	3.37	3.03	2.72	2.44	2.19	1.96	1.76	1.58	1.42	0.97	0.91	0.86	0.80	0.76	0.71	0.67	0.63	0.59	0.56	0.53	0.50	