BEFORE THE HARYANA ELECTRICITY REGULATORY COMMISSION AT PANCHKULA

Case No. HERC/PRO- 59 of 2020

Date of Hearing	**:**	**29.12.2020**
Date of Order	**:**	**18.01.2021**

In the Matter of

Petition under section 62 of the Electricity Act, 2003 read with Regulation 6 (1) of the Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2017 for determination of Tariff of 50 MW Power Project of Amplus Sun Solutions Private Limited located at village Khanak, Tehsil, Tosham, District Bhiwani.

Petitioner M/s. Amplus Sun Solutions Pvt. Ltd.

Respondents
1. Haryana Power Purchase Centre, Panchkula (HPPC)
2. Haryana Renewable Energy Development Agency (HAREDA)

Present On behalf of the Petitioner through Video Conferencing

1. Shri Vishrov Mukherjee, Advocate
2. Shri Rahul Kinra, Advocate
3. Shri Sanjeev Aggarwal, MD & CEO

Present on behalf of the Respondents through Video Conferencing

1. Smt. Sonia Madan, Advocate, HPPC
2. Shri Aditya Grover, Advocate for HAREDA

Quorum

Shri Pravindra Singh Chauhan	**Member (in Chair)**
Shri Naresh Sardana	**Member**

ORDER

Brief Background of the case

1. M/s. Amplus Sun Solutions Pvt. Ltd. has filed the present petition under Section 62 of the Electricity Act, 2003 read with Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2017 (hereinafter referred to as "HERC RE Regulations, 2017"), for determination of

tariff for supply of power from 50 MW Solar Power projects at village, Khanak, Tehsil, Tosham, District Bhiwani, Haryana.

2. The Petitioner has submitted as under:-

a) That a 50 MW Solar Power Project has been developed in the State of Haryana located at village, Khanak, Tehsil, Tosham, District Bhiwani ("Project"). The Project of the Petitioner is ready for commissioning subject to final quality and commissioning tests which will commence once the installation of the ABT meters is complete.

b) That the Commission, vide its Order dated 14.09.2020 (HERC/PRO-45 of 2020) has approved the proposal of HPPC for procurement of power from the Project as well as the Draft PPA under Section 86 (1) (b) of the Electricity Act, 2003, with a direction to Petitioner to file separate Petition under Section 62 of the Electricity Act, 2003 for determination of tariff for the Project. Accordingly, the present petition has been filed.

c) That the HERC RE Tariff Regulations, 2017 notified on 24.07.2018 granted certain benefits to ground mounted / Roof Top Solar power projects and their consumers. Regulation 6 (1) (h) and 7 of the HERC RE Tariff Regulations, 2017 provides for:

"6. Project Specific tariff:-

(1) Project specific tariff, on case to case basis, may also be determined by the Commission for the following types of projects:
………
……….
(h) Solar PV and Solar Thermal Power projects, if a project developer opts for project specific tariff: Provided that the Commission while determining the project specific tariff for Solar PV and Solar Thermal shall be guided by the provisions of these Regulations."

7. *Petition and proceedings for determination of tariff:-*

(2) A petition for determination of project specific tariff shall be accompanied by such fee as may be determined by regulations and shall be accompanied by the following:-
   - *a) Information in forms 1.1, 1.2, 2.1 and 2.2 as the case may be, and as appended to these regulations;*
   - *b) Detailed project report outlining technical and operational details, site specific aspects, premise for capital cost and financing plan etc.*
   - *c) A statement of all applicable terms and conditions and expected expenditure for the period for which tariff is to be determined.*
   - *d) A statement containing full details of calculation of any subsidy and incentive received, due or assumed to be due from the Central Government and/or State Government. This statement shall also include the proposed tariff calculated without consideration of the subsidy and incentive.*
   - *e) Any other information that the Commission may require the petitioner to submit.*

(3) The proceedings for determination of tariff shall be in accordance with the HERC (Conduct of Business) Regulations 2004, as amended from time to time."

47. Technology Aspects. *– Norms for Solar Photovoltaic (PV) power under these Regulations shall be applicable for grid connected PV systems that directly convert solar energy into electricity and are based on the technologies such as crystalline silicon or thin film etc. as may be approved by MNRE.* ***The***

Commission shall not determine generic tariff under these Regulations and only project specific tariff, if required, shall be determined."

d) That the key components of the project is as under:-

Sr. No.	Item	Specifications	Status of the Work
1.	Modules	1. Adani – 340 W – 97560 Nos. 2. Adani – 335 W – 12930 Nos. 3. Trina – 345 W – 71730 Nos. 4. Trina – 340 W – 37530 Nos.	Modules equivalent to DC capacity of 75 MWp are installed at the site as per the design specifications
2.	Inverters	1. Sungrow Central Inverters - 3125 kW – 10 Nos. 2. Huawei String Inverters - 160kW – 117 Nos.	50 MW AC capacity has been installed
3.	Evacuation Infrastructure	1. Bharat Bijlee Transformers – 33 kV/132 kV – 1 Nos. 2. Transmission Line – 1.5 KM single circuit transmission line on double circuit tower	The transmission line from the solar project is connected to the terminal bay of Khanak, HVPNL grid substation

e) That the Technical and Operational details of the Project are available in the Detailed Project Report (DPR).

f) The Petitioner has invested approximately Rs. 2,753.9 Million towards the construction of the Project. Accordingly, the Petitioner has calculated the tariff in accordance with the HERC RE Regulations 2017.

g) Parameters for Tariff Determination as submitted by the Petitioner:-

i) Capital Cost

As per First Proviso to Regulation 11 of the HERC RE Regulations, 2017 for Project specific tariff determination, the generating company shall submit the break -up of capital cost items along with the Petition. Further, as per second proviso in case where land is on lease basis, the cost of land to be taken as part of capital cost shall be determined as per the Land Lease Agreement. In view of the above, the relevant details including break -up of capital cost items as well as cost of land as per lease agreement is provided as under:-

Sr. No.	Head	Rs. Million
1	Capital work incl. plant and machinery	1,983.0
2	Civil Works, erection and commissioning	227.6
3	Financing Cost	32.7
4	Interest during construction	95.9
5	Evacuation infrastructure upto interconnection point including GSS bay in the HVPNL substation	152.9
6	Land lease rentals capitalized during the construction phase as per lease agreement	24.4
7	Project Management Expenses	237.5
	Total	2,754

That in the view of above, Capital cost of Rs. 2,754 Million has been considered for the tariff determination. The breakup of the Capital Cost has been provided in the certificate from Chartered Accountant. Documentary evidence such as invoices and purchase orders that have been used to arrive at the project cost shall be provided to the commission separately.

ii) Debt Equity Ratio

As per Regulation 12 (2) of the HERC RE Regulations, 2017 for project specific tariff if the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan. Provided that where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff. Provided further that the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment.

In view of the above, the Petitioner is proposing 30% of the Capital Cost as Equity. Hence, a Debt-Equity ratio of 70:30 is considered for tariff computation. Based on this Debt-Equity ratio, following are the components of the Debt and Equity based on the Capital cost for the determination of the tariff:

	Particulars	Percentage	Rs. Million
	Capital Cost		2,754
A	Debt	70%	1,927.8
B	Equity	30%	826.2

iii) Loan and Finance Charges.

As per Regulation 13 (1) of the HERC RE Regulations, 2017, the loan tenure shall be considered as 13 years. Accordingly, the loan term of 13 years is considered for tariff computation. Further as per Regulation 13 (2)(b) of the HERC RE Regulations, 2017, the normative interest rate shall be considered as the average Marginal Cost of funds-based lending rate (MCLR) (one-year tenor) of SBI prevailing during the last available six months plus a margin of up to 200 basis points i.e. 2%. It is submitted that due to the unprecedented COVID 19 pandemic situation, there has been a severe impact on the Indian Economy, leading to significant reduction in demand and a contraction of GDP by 23.9% in Apr 2020 to June 2020 quarter alone. Due to an ailing economy, the Government of India has taken a host of measures to revive the economy. One such measure is to increase the supply of money in the market so that the loans are easily available to the ailing businesses and demand can be revived. As such to provide such financial stimulus, the State Bank of India in this unprecedented situation has constantly reduced its MCLR rates since April 2020 when the impact of COVID 19 was felt on Indian and the World economy due to its excessive spread in China and other countries. However, this recent decrease in the 1-year SBI MCLR is just a short-term measure to revive the economy till the business as usual conditions are restored, and is not symbolic of the long-term interest rates that shall be applicable on the long-term loan taken by the generating companies.

In view of the above the Petitioner requests the Commission to consider the 1-year SBI MCLR applicable based on the average for the 6-month period between October 2019 to March 2020 for determination of interest rate instead of taking the last 6 months average as these rates are influenced by the financial stimulus package undertaken by the banks for deal with the COVID 19 pandemic situation, which is not a business as usual condition.

Month	SBI 1-year MCLR	Interest on Loan SBI 1-year MCLR + 200 bps
Sep 2020	7.00%	
Aug 2020	7.00%	
Jul 2020	7.00%	
Jun 2020	7.00%	
May 2020	7.25%	
Apr 2020	7.40%	
Mar 2020	7.75%	Average MCLR = 7.91% Interest rate on loan = 7.91% + 2% = 9.91%
Feb 2020	7.85%	
Jan 2020	7.90%	
Dec 2019	7.90%	
Nov 2019	8.00%	
Oct 2019	8.05%	

In view of the above, interest rate of 9.91% is considered for computation of tariff. Further as per Regulation 13(2)(c) of the HERC RE Regulations, 2017, the repayment of loan shall be considered from the first year of commercial operation and shall be equal to annual depreciation allowed. In view of the above, loan repayment is considered to be an amount equal to annual depreciation.

iv) Depreciation

As per Regulation 14 (1) of the HERC RE Regulations, 2017, the value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission. The salvage value of the asset shall be considered as 10%. Further as per Regulation 14 (2) the Depreciation per annum shall be based on 'Differential Depreciation Approach' over loan tenure and period beyond loan tenure over useful life computed on 'Straight Line Method'. The depreciation rate for the first 13 years of the Tariff Period shall be 5.38% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 14th year onwards. Further as per Regulation 14 (3) the Depreciation shall be chargeable from the first year of commercial operation. Provided that in case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.

In view of the above, the depreciation rate of 5.38% per annum for first 13 years on Straight Line Method and the remaining depreciation spread over the remaining life of the project from 14th year onwards is considered for tariff computation.

v) Return on Equity:

As per Regulation 15 (1) of the HERC RE Regulations, 2017, the value base for the equity shall lower of the two either 30% of the capital cost or actual equity (in case of project specific tariff determination) as determined under Regulation. Further as per Regulation 15 (2) of the HERC RE Regulations, 2017, the normative Return on Equity shall be as under:

(a) 14% per annum calculated on normative Equity Capital.

(b) MAT/Corporate Tax applicable shall be considered as pass through.

Provided that the applicable MAT / Corporate Tax shall be separately invoiced as per the actual paid at the rate as declared by the Income Tax Department. The Generator shall raise the bill for reimbursement of MAT / Corporate Tax applicable on Return on Equity in 12 equal instalments which shall be payable by the beneficiaries.

In view of the above, the Return on Equity of 14% is considered for tariff computation. MAT / Corporate Tax as applicable shall be pass through on actual basis.

vi) Interest on Working Capital

As per Regulation 16(1) of the HERC RE Regulations, 2017, the working capital requirement of Solar PV and Solar thermal power projects shall be computed in accordance with the following:

(a) Operation & Maintenance expenses for one month;

(b) Receivables equivalent to 2 (two) months of fixed and energy charges for sale of electricity calculated on the normative CUF / PLF;

(c) Maintenance spare @ 15% of operation and maintenance expenses.

Further as per Regulation 16(3) of the HERC RE Regulations, 2017, Interest on working capital, for the purpose of tariff determination, shall be computed at the average Marginal Cost of funds-based lending rate (MCLR) (one-year tenor) of SBI prevailing during the last available six months plus an appropriate margin not exceeding 200 basis points i.e. 2%.

As detailed in this Petition, that due to the ongoing COVID-19 pandemic situation there has been a short term drop in the interest rates which is not a business as usual condition therefore the Petitioner has considered the average (1 year) SBI MCLR applicable for the 6 month period between October 2019 to March 2020 of 7.91% plus 2% as the working capital interest.

In view of the above, applicable interest rate of 9.91% on working capital has been considered for computation of tariff.

vii) Operation and Maintenance Expenses

As per Regulation 17 (1) of the HERC RE Regulations, 2017, the Operation and Maintenance Expenses (O&M) expenses shall comprise repair and maintenance (R&M), establishment including employee expenses and administrative expenses.

Further, as per Regulation 49 (1) of the of the HERC RE Regulations, 2017, the O&M Expenses shall be determined based on the prevalent market conditions and as per Regulations 49(2) Normative O&M expenses allowed by this Hon'ble Commission during commencement year of the HERC RE Regulations 2017, shall be escalated at 5.72% per annum.

In view of the above and to ascertain the prevalent market conditions, the Petitioner has obtained quotes from two reputed O&M contractors for the comprehensive operation and maintenance of the Project:

Sr. No.	Name of the O&M Contractors	Base O&M (excl. GST)	GST (18%)	Total O&M (incl. GST)	Total O&M per MWp
		Rs. Million per annum	Rs. Million	Rs. Million per annum	Rs. Million per annum
1	M/s Sterling and Wilson Solar Limited	32.6	5.9	38.5	0.51
2	M/s Mahindra Teqo Private Limited	29.1	5.2	34.3	0.46

In addition to the O&M expenses, the Petitioner would also need to procure insurance for the Project to fulfil his obligations under the Article 8 of the Draft PPA.

Clause 8.1 and 8.3 of the approved Draft PPA as reproduced below:

*"**Clause 8.1:** The Solar Power Developer shall be responsible for obtaining and keeping in force at its own cost, all necessary Consents, Clearances, and Permits, **insurances** required for establishing and operating the*

Solar Power Project.

Clause 8.3: *The Solar Power Developer shall be responsible at its own expense for ensuring that the Solar Power Project is operated and maintained in accordance with all legal requirements including the terms of all Consents, Clearances and Permits,* ***insurances*** *and Prudent Utility Practices within the acceptable Technical Limits so as not to have an adverse effect on the Grid System or result in violation of any rules/Law."*

S No.	Name of the Insurance Vendor	Base (excl. GST)	GST (18%)	Total Insurance (inc. GST)	Total Insurance per MWp
		Rs. Million per annum	Rs. Million	Rs. Million per annum	Rs. Million per annum
1.	HDFC Ergo	5.82	1.05	6.87	0.1
2.	Bajaj Allianz	5.86	1.06	6.92	0.1
3.	ICICI Lombard	5.90	1.06	6.96	0.1

The average of the quotes received from O&M Contractors is Rs. 36.4 Million per annum and the average of quotes from Insurance companies is Rs. 6.92 Million per annum leading to an aggregate Operating and Maintenance expense of Rs. 43.3 Million per annum which is considered for the tariff determination along with an escalation of 5.72% p.a. as per the HERC RE Regulations, 2017. The aggregate Operating and Maintenance expense considered by the Petitioner at Rs. 0.58 Million per MWp is lower than that considered by various Regulatory Commissions across the country. Details of Operation and Maintenance charges considered by some of regulatory commissions in the recent times are given below:

S. No.	Relevant Commission	Operation & Maintenance per MW	Reference Order
1	TNERC	0.59	Order No. 5 of 2019 dated 29-03-2019
2	JERC	0.75	RE Tariff Order for FY 2020-21
3	KUSUM	1.05	HERC/PRO-57 of 2019

In view of the above, the petitioner requests the Commission to consider the following:-

Operations and Maintenance expense of Rs. 0.49 Million per MWp per annum excluding insurance expenses

Aggregate Operations and Maintenance expense of Rs. 0.58 Million per MWp per annum including insurance expenses.

viii) Lease Rentals

The Petitioner has already entered into lease agreements with the landowners of the land on which the Project is installed. The Project uses a total of 260.1 acres of land which is leased by the Petitioner at Rs. 10.99 Million of lease rental which is applicable for the period between 01.11.2020 and 31.10.2021, and shall escalate at 5% per annum.

ix) Capacity Utilization Factor

As per Regulation 48 of the HERC RE Regulations, 2017, the Commission shall decide the Capacity Utilization Factor **("CUF")** in case of project specific tariff determination. The Solar Photovoltaic (PV) industry across the world uses simulations tools for estimating the project specific CUF which any solar PV project is expected to generate during operations. The most popular and one of the oldest such simulation tool is PVSYST which is developed by the University of Geneva and is used across the world by solar PV industry.

The Project has a total AC capacity of 50 MW and have total module capacity of 75 MWp (DC Capacity). Based on the PVSYST simulations for the Project, the CUF is estimated to be 17.27% DC (25.91% CUF AC). The CUF is further adjusted for 0.5% of plant unavailability and 1% of grid unavailability leading to a CUF of 17.01% (25.52% CUF AC) which is used for tariff determination. The grid unavailability is assumed as 1% as the Clause 12.3 of the approved Draft PPA does not provide for any compensation if the grid unavailability is upto 1%. The Clause 12.3 is reproduced below for the reference:

"Clause 12.3: Generation Compensation in offtake constraints due to Grid Unavailability less than 99.0%:

During the operation of the Solar Power Project, there can be some periods where the Project can generate power but due to temporary transmission unavailability, the power is not evacuated, for reasons not attributable to the Solar Power Developer. In such cases, subject to the submission of documentary evidences from the competent authority, the generation compensation ("Generation Compensation") shall be restricted to the following and there shall be no other claim, directly or indirectly against HPPC/STUs:

Duration of Grid unavailability	Provision for Generation Compensation
Grid unavailability in a Contract Year as defined in the Agreement: (only period from 8 am to 6 pm to be counted):	Generation Loss = [(Average Generation per hour during the Contract Year) × (number of hours of grid unavailability during the Contract Year minus 87.6 hrs)] Where, Average Generation per hour during the Contract Year (kWh) = Contracted Energy in the Contract Year (kWh) ÷ Total hours of generation in the Contract Year.

The excess generation beyond the Contracted Energy by the Solar Power Developer equal to this generation loss shall be adjusted by HPPC at the Excess Generation Tariff so as to offset this loss in the succeeding 3 (three) Contract Years.

The Generation Compensation, if applicable, shall be paid at the end of the Contract Year along with the monthly energy bill for the first successive month."

The Commission in its order HERC/PRO-20 of 2016 dated November 22, 2016 for determination of tariff for power from 10 MW solar power plant at PTPS, has taken a CUF of 21% AC. Also, in the order HERC/PRO- 57 of 2019 for purchase of power under KUSUM scheme, the Commission has considered a CUF of 20% AC.

The CUF proposed by the Petitioner is 25.52% AC which is due to the efficient design capabilities of the Petitioner and is significantly higher than that given by the Commission in its previous orders.

The Petitioner would also like to highlight that a combination of Sungrow central inverters and Huawei string inverters are being used in the Project having a cumulative output capacity of 50 MW AC. The capacity of these inverters is rated by the manufacturers assuming an ambient temperature of 50 degrees Celsius. If the ambient temperature is lower, then the same inverters can generate a higher power during operation.

The average temperature at the Project is expected to be 25.6 degrees Celsius and the maximum temperature is estimated to be around 40 degrees Celsius. At these temperatures, the inverters installed at the Project are expected to generate power in excess of 50 MW AC.

However, if the AC power of the Project is capped at 50 MW AC, then there would be suboptimal utilization of the Project and loss of electricity. The Petitioner requests this Commission to allow operation of the Plant upto 110% of the inverter output capacity. In this case, the CUF of the Project will be 17.36% DC (26.04% CUF AC) which after adjusting for 0.5% plant unavailability and 1% grid unavailability will lead to a CUF of 17.10% DC (25.65% CUF AC). This will lead to a tariff of Rs. 3.84/unit which is lower than Rs. 3.86/unit tariff calculated in the scenario of limiting the inverter output capacity to 50 MW AC.

In view of the above, the Petitioner prays the Commission to allow operations upto 10% additional operation of the inverters so that the plant can be utilized to the maximum capacity and the benefit of the lower tariff may be passed on to the consumers.

x) Sharing of CDM Benefits.

As per Regulation 20 (1) of the HERC RE Regulations, 2017, the proceeds of carbon credit from approved CDM project, after deduction of expenses incurred by the generating company for registration and approval of the project as CDM project shall be shared between generating company and concerned beneficiaries in the manner as provided under the Regulations. The above provisions have already been captured in the Draft PPA to be executed.

xi) Subsidy or incentive by the Central / State Government.

As per Regulation 21 of the HERC RE Regulations, 2017, the Commission shall take into consideration any incentive or subsidy offered by the Central or State Government, available to the generating company, for the renewable energy power plants while determining tariff the HERC RE Tariff Regulations, 2017.

The Project has availed the exemption of stamp duty charges for registration of land lease agreement totalling to Rs. 1.9 Million which is provided as per the Section 4.11 of the Haryana Solar Power Policy, 2016 dated 14th March 2016. The rate of stamp duty charges is as per the applicable Article 23 and Article 35 of Schedule 1(A) of the Indian Stamp Act, 1899

Amendments to the Executed PPA

h) That Solar PV solar projects are regarded as an infirm source of power which is dependent on factors which are beyond human control such as global horizontal irradiation ("GHI") from sun, ambient temperature etc. The GHI does not have a fixed pattern and shows significant yearly and seasonal variation. The project developer has limited control over the CUF achieved by the project as the CUF is largely dependent on the GHI. Solar Energy Corporation of India ("SECI"), has recently conducted competitive bidding for ISTS connected Solar PV power projects in India (ISTS-IX) through RFS No. SECI/C&P/SPD/ISTS- IX/RfS/2000MW/032020 dated 20.03.2020. As per the terms of the bidding the solar project developer has to achieve the CUF within minus fifteen percent (- 15%) of the declared CUF for the first 10 years from COD and within minus twenty percent (-20%) of the declared CUF after the 10th year till the end of PPA term.

i) In the light of the above the Petitioner requests the Commission to allow the Project to achieve a CUF within minus fifteen percent (-15%) of the declared CUF for the first 10 years from COD and within minus twenty percent (-20%) of the declared CUF after the 10th year till the end of term of the approved Draft PPA instead of the currently approved deviation of minus five percent (- 5%) of the declared CUF and seeks the approval of the Commission for following amendment to the approved Draft PPA to bring this into effect.

Clause No	Original Language	Proposed Amendment (Changes required are in bold and underlined)
4.6	Solar Power Developer shall maintain generation so as to achieve minus five percent (-5%) variation of the Declared CUF. The Solar Power Developer will be liable to pay to HPPC, penalty for the shortfall in CUF any Contract Year below 95% of the Contracted Energy. The amount of such penalty will be in accordance with the terms of this Agreement, which shall ensure that HPPC is offset for all potential costs associated with low generation and supply of power under the Agreement, subject to a maximum of 25% (twenty-five per cent) of the cost of this shortfall in energy terms, calculated at the Tariff. However, this compensation shall not be applicable in events of Force Majeure Event identified under the Agreement affecting supply of Solar Power by Solar Power Developer.	Solar Power Developer shall maintain generation so as to achieve minus fifteen percent (- 15%) variation of the Declared CUF for the first 10 years from the Commercial Operation Date and minus twenty percent (-20%) of the Declared CUF beyond 10 years from Commercial Operation Date and till the Duration of the Agreement. The Solar Power Developer will be liable to pay to HPPC, penalty for the shortfall in CUF any Contract Year below 85% of the Contracted Energy during the first 10 years from the Commercial Operation Date and 80% of the Contracted Energy beyond 10 years from Commercial Operation Date and till the Duration of the Agreement. The amount of such penalty will be in accordance with the terms of this Agreement, which shall ensure that HPPC is offset for all potential costs associated with low generation and supply of power under the Agreement, subject to a maximum of 25% (twenty-five per cent) of the cost of this shortfall in energy terms, calculated at the Tariff. However, this compensation shall not be applicable in events of Force Majeure Event identified under the Agreement affecting supply of Solar Power by Solar Power Developer.

j) Following prayers have been made:-

i) Determine Tariff under Section 62 of the Electricity Act, 2003 for 50 MW Solar Power Project of the Petitioner located at Village, Khanak, Tehsil, Tosham, District Bhiwani;

ii) Allow Petitioner to amend Clause 4.6 of the approved Draft PPA so that the Project can achieve a CUF within minus fifteen percent (-15%) of the declared CUF for the first 10 years from COD and within minus twenty percent (-20%) of the declared CUF after the 10th year till the end of term of the approved Draft PPA;

iii) Pass such other orders and/or directions as may be deemed fit and necessary in the interests of justice.

Proceedings in the Case

3. In order to afford an opportunity to the general public / Stakeholders to study / analyze the proposal and file their objections / suggestions / comments, the petition filed by M/s. Amplus Sun Solutions Pvt Ltd. was made available on the website(s) of the Commission as well as that of the Petitioner. Public Notice was issued by M/s. Amplus

Sun Solutions Pvt Ltd. in the Newspapers, having wide circulation, for inviting objections/suggestions from the stakeholders / General Public or any interested person, in accordance with Section 64 of the Electricity Act, 2003 read with the Haryana Electricity Regulatory Commission (Conduct of Business) Regulations, 2019 as amended from time to time. The said public notice got published by the Petitioner in the following Newspapers:-

Name	Language	Date of publication
The Pioneer	English	10.11.2020
Punjab Kesri	Hindi	10.11.2020

The public notice issued by the Commission was published in the following newspapers, with last date of filing the objections as 23.11.2020:-

Name	**Language**	**Date of publication**
Indian Express	English	04.11.2020
Dainik Jagran	Hindi	04.11.2020

4. Pursuant to the public notice given by the Generator as well as by the Commission, following objectors filed comments/objections:-

i) M/s. Connect Solar
ii) Sh. Anil Kumar
iii) Sh. Rajbir
iv) Sh. Pradeep Kumar
v) Dr. Monika Sharma
vi) Ms. Neelam Singh
vii) HPPC

The Generator has filed its reply on the comments/objections received from the abovementioned objectors, on affidavit dated 18.12.2020. Most of the objections/comments so filed by the interveners/objectors are general in nature and are not relevant in the present case relating to tariff determination of the Petitioner's 50 MW Solar Power Plant. However, the comments specific to the present case along with the reply filed by the generator thereon, have been considered by the Commission, while deciding the present case.

The same are summarized as under: -

i) **M/s. Connect Solar** has submitted that generator may be directed on the following aspects:-

a) Optimum utilization of land and water resources.
b) Optimum Utilization of local human resource.
c) Emphasis on increasing efficiencies / output and moving from infirmness to firmness – by proper sizing of the solar plant in terms of AC:DC ratio.

d) Exploring and implementing avenues to use the land under the solar plant area – by growing low height vegetation in the land not covered by concrete.
e) Use of the environmentally safe material for the solar power generation.

Reply of the Generator:

Connect Solar has no locus to submit comments on the present Petition since, Connect solar is neither situated in the State of Haryana nor it is a consumer of any of the Discoms. On the contrary the letter head suggests that the Connect Solar is based out of State of Madhya Pradesh. As such the present proceedings before this Commission nowhere affects Connect Solar, and the tariff determined under the present proceedings would not be applicable on Connect Solar.

Commission's View:

The objections filed by the ibid intervenor is general comments/advisory in nature. The petitioner may take note of the same for cost effective management of the project.

ii) **Sh. Anil Kumar**

a) Current rate of solar power is Rs. 2.50/kwh. The tariff of solar power discovered through bidding last held by HPPC was Rs. 2.73/kWh for 240 MW. Even for 1 MW project, the rate discovered was Rs. 2.999/kWh. Whereas the Petitioner has demanded exorbitant tariff of Rs. 3.86/kWh.
b) The RPO shortfall should be met out of REC at Rs. 1/unit, in view of surplus power scenario. This will take care of RPO in short term while the long term RPO can be addressed with purchase of power by inviting bids with lower power purchase cost likely to be in the range of Rs. 2.5/unit.
c) Power in long term should not be procured without tender.
d) Tariff should be pegged to tariffs discovered under the future competitive bidding process by Haryana or Central Govt. In any case, companies should not be allowed higher tariffs by inflating their Capex Costs.

Reply of the Generator:

Mr. Kumar is indirectly trying to challenge the Order dated 14.09.2020 passed by this Commission in PRO 45 of 2020, Haryana Power Purchase Centre v. M/s Amplus Sun Solutions Private Ltd., which is impermissible in the present proceedings. By the said Order this Commission has dealt with the issues of power availability as well as deficit in Renewal Purchase Obligations of the Discoms.

Commission's View:

The Commission has taken note of the comments filed by the intervenor and observes that the provision for competitive bidding (Section 63 of the Act) does not take away the powers of the Commission under Section 62 of the Act. The Commission exercises prudence check before admitting capital cost to remove padding up of CAPEX, if any, including dis-allowing capital cost that is not permissible under the Regulations in vogue. Further, the tariff discovered through competitive bidding route depends on various factors including location and size of the project. Hence, at the most a trend can be discerned from the various rates discovered. However, they can not be considered as a ‘cap’ while determining project specific tariff as in the present case.

iii) **Sh. Rajbir:**

a) Tariff offered under KUSUM scheme is Rs. 3.11/kWh, even for small project of 0.50 MW.

b) Tariff for a bigger project such as 50 MW project is Rs. 3.86/kWh, which is non-transparent and against the principles of fairness.

Reply of the Generator:

a) At the outset is stated that M/s Amplus Sun Solutions Private Limited is not a foreign company but an Indian Company incorporated under the Companies Act and is part of Amplus Solar Group of companies and is a generating Company in terms of Section 2(28) of the Electricity Act, 2003 and has established the Project, i.e., a 50 MW solar power project at Khanak, Bhiwani, Haryana.

b) The Petitioner has not come through the back door but had only filed the present Petition pursuant to the understanding reached between the parties for procurement of power from the Project of Petitioner by the Haryana Discoms and Order dated 14.09.2020 passed in Pro 45 of 2020, whereby this Commission has approved procurement of power from the Project as well as the Draft PPA under Section 86 (1) (b) of the Electricity Act, 2003, with a direction to Petitioner to file separate Petition under Section 62 of the Electricity Act, 2003 for determination of tariff for the Project.

Commission’s View:

The Commission observes that the rate i.e. Rs. 3.86/unit is just a proposal filed by the portioner. The Commission, after exercising prudence check as well as keeping in view the objections filed by the interveners, shall determine the tariff payable to the petitioner in the present proceedings.

iv) **Sh. Pradeep Kumar:**

a) The scheme was not advertised by HPPC to get maximum participation and to ensure that cost of power is lowest.

b) The cost of power @ Rs. 3.86/unit is 65% higher than cost of similar power seen in the country.

c) In the past, right to set up such plants in this mode, has been denied by HPPC and HERC.

Reply of the Generator:

Same as in the case of the reply to the comments filed by Sh. Rajbir.

Commission's View:

The Commission has taken note of the objections and observes that while determining tariff, a balanced view shall be taken.

v) **Dr. Monika Sharma: (PIL applicant in P&H High Court)**

a) Submissions are being made without prejudice to the rights of the applicant in CWP-PIL No. 154 of 2020 pending before the Hon'ble High Court of Punjab and Haryana at Chandigarh, whereby the order dated 14.09.2020 passed by the Commission in HERC/PRO - 45 of 2020, has been challenged.

b) In terms of the National Tariff Policy, 2016 and Haryana Solar Power Policy, 2016, procurement of Solar Power should have been done only through competitive bidding so discover the lowest tariff, however, in the present case, HPPC has decided to purchase electricity by negotiation without following the competitive bidding process.

c) HPPC had itself issued a notice inviting tender in January, 2019 for purchase of 300 MW of solar power. The Commission vide its order dated 19.05.2020 has approved the procurement of solar power at Rs. 2.73 per unit by HPPC from M/s Avaada Energy Pvt. Ltd., which should be treated as ceiling tariff.

d) Haryana is already power surplus to the extent of about 20% and the present purchase will result in the additional burden on the DISCOMs and consumers.

Reply of the Generator:

a) Dr. Sharma is indirectly trying to challenge the Order dated 14.09.2020 passed by the Commission in PRO 45 of 2020, which is impermissible in the present proceedings.

b) On comparison M/s Avaada Energy Pvt. Ltd for which the Commission vide its order dated 19.05.2020 has approved the procurement of solar power at Rs. 2.73 per unit by HPPC from M/s Avaada Energy Pvt. Ltd, it is submitted that:-

   i) Petitioner has sought for Project Specific tariff in accordance with the provisions of the HERC RE Regulations, 2017. Dr Sharma has failed to point out any discrepancies in the details submitted by the Petitioner for each component of tariff (ROE, Depreciation, Capital Cost, Interest of Working Capital, Financing Cost etc.). As such the contention of Dr Sharma to benchmark the tariff of Petitioner with that of M/s Avaada Energy Pvt Ltd is baseless and is liable to be ignored.

   ii) Commission is well aware that every project is different in terms of various technical parameters like equipment configuration, transmission evacuation infrastructure, land cost, financing costs, duties and taxes, foreign exchange rates, and the timing of incurring the cost. However, the Petitioner is fully committed to transparently provide all information within its control.

Commission's View:

It is re-iterated that competitive bidding option does not in any manner take away the powers of the Commission to determine project specific tariff under section 62 of the Electricity Act, 2003. Further, all parameters including project cost is allowed by the Commission after due-diligence and prudence check. Additionally, RE Power is allowed for purchase to meet the RPO trajectory specified by the Commission in the RE Regulations as may be amended from time to time.

vi) **Ms. Neelam Singh:**

a) Solar electricity price is currently trending at Rs. 2.7 per unit. Addition of solar power in current scenario is expected to reduce the power purchase cost.

b) The generator has claimed total project cost of Rs. 275 crores for 50 MW Project which works out to Rs. 5.5 crores/MW. This is however without the cost of land which the generator has taken on lease. This cost is not justified by any means.

c) The Commission in its Order dated 20.12.2019 in PRO-57 of 2019 for determination of levelized tariff for purchase of power from decentralized Solar Power Plants set up under PM Kusum Scheme had considered capital cost of Rs. 3.4 crores/MW and worked out a levelized tariff of Rs. 3.11 per unit. Ministry of New and Renewable Energy vide notification dated 21.07.2020 also notified benchmarking cost for Grid connected Rooftop Solar Photo voltaic systems ranging from100 kW to 500 kW for the FY 2020-21 as Rs. 36 per Watt i.e Rs. 3.6 crores/MW even for very small installations. The average per MW capital cost for 50 MW project should have been even less. In the current scenario the cost of large scale grid connected solar plant is about Rs. 2.5 to 3.0 crores/MW only. As such prudent analysis of the capital cost posed by the generator is required to be carried out so as imprudent cost or inefficiencies of generators may not be loaded on the consumers of Haryana by the way of electricity tariffs.

d) The generator has claimed a total O&M expense of Rs. 5.9 lakhs per MW. The Commission may take cognizance of the fact that for a 1 MW solar PV the Commission in its PM Kusum order had considered 10.5 lacs. Hon'ble KERC has posed the same as Rs. 4.50 Lakh/ MW for ground mounted Megawatt Scale Solar Plants upto 5 MW. The law of prorate basis in calculating O&M expenses considering the cost of small scale plants would be imprudent. The O&M expenses should have been around Rs. 3.0 lacs/MW in case of 50 MW project.

e) The generator has claimed CUF of 17.27% whereas 19% is the minimum CUF being adopted across the states.
f) The generator has proposed an escalation of 5.72% on O&M expenses as provided in the HERC Regulations. This seems to be on higher side as CERC in its current order has considered the O&M for small scale upto 5 MW project at the rate of 3.84% per annum. O&M escalation rate should have been even less in case of generator considering the scale of economies.
g) The generator has claimed interest on Loan on one year SBI MCLR in contrary to Regulations which provides for the average of 6 month period. The generator has not provided any document to specify that he is actually interest being paid by him. This being a ceiling parameter, the Commission should consider lower of a) six-month average SBI MCLR or b) actual interest being paid. Interest rates are expected to go down in future and as such may be pegged at current SBI MCLR rates.
h) Opportunity may also be given to attend the Public hearing.

Reply of the Generator:

Reply of the Generator on the comments filed by Ms. Neelam Singh are mostly covered in the reply of the Generator on the comments filed by HPPC. Generator has additionally replied as under:-

a) The present project was originally envisaged an Open Access Project and now the said cheaper power will be sold to the Distribution Company of Haryana and the same will be in overall interests of the consumers of the State of Haryana.
b) All the equipment has been installed at the site and only installation of ABT meters was pending at the time of filing of the Petition. It may be further noted that costs are incurred basis completion of project works whereas commissioning of the project also requires certain regulatory approvals to be in place. Hence comparison of cost incurred with the status of project is ill founded. Further, the costs incurred by the Petitioner are in line with the price trends during the time the Project was constructed.
c) The timeline for implementation of Petitioner’s project was impacted by the delay in execution of Connectivity Agreement. This has resulted in an increase in IDC of the Project.
d) Regarding objection that the project cost of Rs 275 Crores is not justified, the Petitioner had submitted all information and data as well as the break-up cost as envisaged under Regulation 11 of the HERC Tariff Regulations, 2017. The Petitioner reiterates that every project is different.

e) That the Petitioner has applied for determination of project specific tariff under Section 62. Hence, the consideration of capital cost should be based on actual cost incurred by the Petitioner for development of the Project.

Commission's View:

The Commission has taken note of the objections raised by the intervener as well as the reply filed by the Petitioner herein. The same shall be reckoned with while determining the various parameters in the present case.

vii) **Respondent - HPPC:**

a) The Petitioner is already running 50(AC)/75(DC) MWp Solar Power Plant, which was commissioned on 28th Nov 2019 in district Mirzapur, Uttar Pradesh. The actual details of the parameters of the said Plant would be relevant for the consideration of this Commission.

b) **Capital cost:-**

Capital cost claimed to be already incurred by the Petitioner:-

Sr. No.	Particulars	Cost alleged to have been incurred uptill now (in crores)	Cost per MW_{DC} (INR) (in crores)
1.	Module, Plant and Equipment Cost including Land cost capitalized during construction phase as per lease agreement	170.36	2.271
2.	Civil Work, erection and Commissioning	14.68	0.195
3.	Evacuation Infrastructure	12.40	0.165
4.	IDC and Pre-operative Expenses	26.15	0.349
5.	Land cost capitalized during construction	2.38	0.032
TOTAL		**225.97**	**3.01**

Capital cost proposed to be incurred by the Petitioner, before commissioning:-

Sr. No.	Particulars	Cost alleged to be incurred in future (in crores)	Cost per MW (INR) (in crores)
1.	Module, Plant and Equipment Cost including Land cost capitalized during construction phase as per lease agreement	27.94 (About 16.4% of the cost alleged to have been already incurred under this head)	0.3725
2.	Civil Work, erection and Commissioning	8.08 (About 55% of the cost alleged to have been already incurred under this head)	0.107
3.	Evacuation Infrastructure	2.89 (About 23.3% of the cost alleged to have been already incurred under this head)	0.038
4.	Financing, IDC and Pre-operative Expenses	10.46 (About 40% of the cost alleged to have been already incurred under this head)	0.139
TOTAL		**49.37**	**0.654**

It seems unbelievable that a substantial Plant and machinery and Civil cost of 38.91 Crore is estimated to be incurred. This is the biggest cushion that the Petitioner is playing on for increasing the tariff. Further, proposed Financing, IDC and Pre-operative Expenses of Rs. 10.46 crores are way higher than the market trend.

The Commission in its Order dated 20.12.2019 (PRO-57 of 2019), in the Petition for determination of levelized tariff for purchase of power from decentralized Solar Power

Plants set up under PM KUSUM Scheme, upto 2 MW, has determined Capital cost for the Solar Projects at Rs. 3.40 crore/ MW. The said cost included cost of the Land, evacuation system as well besides monetised value attributed to degradation of solar panels. Further, the PM Kusum scheme tariff is for the plants upto 2.0 MW only. The said tariff ought to be further reduced for large scale Megawatt projects. The above capital cost for small scale grid connected solar PV has been considered by this Commission for a resultant CUF of 19%. Assuming the Capital Cost approved by this Commission as indicator of the market trend for FY 2018-19, the Capital Cost for the Petitioner at the alleged CUF of 17, works out to be Rs. 3.042/ MW (3.40 * 17/19). Further, considering that the capital cost of the Plant of the Petitioner is exclusive of cost of land, downward trend of the prices and applying economies of scale for the capacity of the Plant of the Petitioner, the capital cost of Rs.3.042/ MW shall be reduced by 15-20%. Meaning thereby the reasonable capital cost for the Plant of the Petitioner shall not exceed Rs. 2.50/MWDC. Thus, the Capital Cost claimed by the Petitioner is in no manner aligned to market trend and not worthy of consideration.

Uttarakhand Electricity Regulatory Commission in Order dated 07.06.2019 (Petition No. 18 of 2019) for review of the Benchmark Capital Cost for Solar PV Plants to be applicable for FY 2019-20 had approved total Capital Cost of Solar PV plants as Rs. 3.56 crore/ MW, after considering GST and Duties and without land cost the same is Rs. 3 crore/MW. Considering the economies of scale, capital cost should be Rs. 2.5 crore/MW DC.

RERC) in their order dated 11.02.2020, while determining tariff under PM KUSUM scheme, has determined the cost of setting up 1 MW solar plant along with 3 kM 11 kV connected line as Rs. 3.65 Crores per MW. The cost of project without the cost of11 kV line/breaker works out to be Rs. 3.50 crores per MW.

MNRE vide Office Memorandum dated 21.07.2020 has notified benchmarking cost for Grid connected Rooftop Solar Photo voltaic systems ranging from100 kW to 500 kW for the FY 2020-21 as Rs. 36 per Watt. The cost of solar plant considering this standard is Rs. 3.6 crores per MW even though the increase in capacity of Plant shall further decrease the cost of Project substantially.

KERC, vide its order dated 1.08.2019 has approved the Capital Cost of Rs. 3.17 crore/ MW excluding the cost of Land, for project capacity of less than 5 MW. The said cost takes into account the fact that the report given by PV insight as on 22.04.2019 evincing average module cost at about Rs.14.89/watt.

Commission's View:

The Commission has taken note of the intervener's submissions on capital cost and observes that the same is at variance from one State to another. Hence, the Commission, after applying prudence check, on the data submitted by the petitioner shall determine capital cost for the purpose of Tariff determination in the present case.

c) **O&M:-**

The Petitioner has claimed a total O&M expense of Rs. 5.8 lakhs per MW. The said O&M expenses are inclusive of Insurance expenses but exclusive of lease rentals. The sole basis for claiming such amount is the quotations/ offers from Contractors/ Vendors. The Petitioner is already running 50 MWAC Solar Power Plant in Uttar Pradesh. The Petitioner ought to have produced certified O&M cost incurred on running of the said Plant.

As per RE Regulations, 2017, the Commission has to determine O& M Expenses as per the market trend. In this regard, it is pertinent to highlight that BHEL has recently submitted an offer dated 15.10.2020 for Operation and Maintenance works of NTPC 50 MWp Solar Power Plant at Andhra Pradesh for a period of 11 months wherein the estimated cost has been submitted as Rs 64.42 Lakhs (Approx.) exclusive of GST. Based on the said offer, the O&M cost for 50 MW solar PV based project works out to be Rs. 70.27 lakh/year i.e. 1.4055 lakh/ MW/Year only. Considering GST of 18 % and insurance cost of plant @ Rs. 65 lacs/year, the O&M cost for a 50 MW solar PV plant works out lesser than Rs. 150 lakh/year exclusive of lease rents.

The KERC had also in their Order dated 01.08.2019 has considered O&M expenses inclusive of insurance and all allied expenses as Rs. 4.50 Lakh/ MW for ground mounted Megawatt Scale Solar Plants up to 5 MW. The said cost is further liable to be discounted for High capacity Solar Plants as the O& M cost per MW does not increase at the same proportion with the increase in the capacity of the Plant.

The claim of the petitioner for O& M is therefore, way exorbitant and not worthy of any consideration.

The Commission in its draft HERC RE Regulations, 2020 has proposed O&M escalation rate of 3.84% per annum in line with CERC Renewable Energy Regulations 2020. Whereas, the Petitioner has taken the escalation rate as 5.72%, at par with the existing HERC RE Regulations, 2017.

The ibid escalation factor has been calculated based on the five years (FY 2014-15 to FY 2018-19) average of CPI (4.92%) and WPI (1.31%) indices and by considering the weightage of CPI and WPI in the ratio of 70:30. Thus, the escalation factor worked out to be 3.84%. Whereas, the Commission vide its order dated 04.08.2015 in 4th amendment, 2014 of HERC RE Regulations 2010 had considered O&M escalation considering a weightage of WPI to 55% and weightage of CPI to 45%. Considering the above philosophy finalized by the Commission, the O&M escalation factor works out to be 2.93% and may be considered by the Commission.

Commission's View:

The Commission has considered the above submission and observes that O&M contracts are fairly broad based and as such mere quotations cited by the Petitioner cannot be taken at its face value for the purpose of tariff determination. Hence, the Commission is of the considered view that the offer dated 15.10.2020 made by BHEL for 50 MWp Solar Power Plant of NTPC cited by the intervener i.e. HPPC, ought to be the benchmark depicting the prevalent market trend. Consequently, the same shall be considered for the purpose of tariff determination.

As far as annual escalation is concerned, the same shall be governed by the Regulations in vogue i.e. HERC RE Regulations, 2017.

d) **<u>CUF:-</u>**

The Petitioner has claimed CUF of 17.27% DC (25.91% AC) based on PVSYT simulations report for the Project.

The PPA dated 23.07.2020 executed between Sandhar Technologies Limited and Amplus Sun Solutions Private Limited for sale of 9.402 MWp (DC) generated from the instant Plant of the Petitioner, the Petitioner had considered annual generation of 14573100 units at Nigam's sub-station against the contracted capacity of 9.42 MWDC. After grossing up the above generation with transmission losses @ 2.5% to work out the generation available at the interconnection point/pooling substation, the same works out to 14946769 units. Considering the estimated generation at interconnection point/pooling substation of Developer/ Petitioner, the CUF works out to 27.17% AC and 18.11% DC. It is evident that the CUF computed on the actual generation shall be to the tune of 19 % only for DC capacity in line with the minimum CUF considered in the HERC RE Regulations, 2017.

M/s LR Energy Pvt. Ltd., in its Detailed Project Report (DPR) for 20 AC/24 DC MW solar PV generation Plant located at Bhiwani, based on PVSYST report, envisaged specific generation per kWh as 1646 units, which works to a DC CUF of 18.80%.

The Commission in Order dated 20.12.2019 had taken CUF as 20%. It would be pertinent to point out Most of the SERCs across the Country have adopted a CUF within range of 19% -21% for Solar PV.

Thus, the CUF of the Plant of the Petitioner should not be considered lower than 19% DC and 28.5% AC after considering the DC to AC ratio as 1.5.

Commission's View:

The Commission has taken note of the contentions of the intervener. It is observed that in Haryana the level of direct solar irradiation is comparatively lower than many other States. Hence, while benchmarking CUF for KUSUM projects, the Commission had considered CUF of 20%. In the present case, the petitioner has itself proposed CUF of 25.91% AC based on its system configuration (DC:AC), efficiency of modules, PVSYST simulations, which is better than 19% to 21% benchmark cited by the intervener. Resultantly, the proposal of the Petitioner is acceptable.

e) **Compensation for grid unavailability:-**

The contention of the Petitioner regarding compensating for grid unavailability up to 1% is untenable and may not be considered as such. The Commission in its order dated 20.12.2019 while determining tariff under PM KUSUM scheme has not considered reduction of CUF on this account. The Clause of PPA further provides for mechanism for adjustment of this loss in the subsequent years, as such, loss of CUF on this account may not be considered. Without prejudice to above, even if the contention of the Petitioner founds any merit by the Commission, compensation percentage shall be calculated considering average hours i.e. 43.8 hours only subject to deletion of condition in PPA, which provides for adjustment of such loss in subsequent years.

Commission's View:

The Commission has considered the submissions of the intervener. At this stage, the Commission is not inclined to build in compensation for grid unavailability by adjusting the CUF. However, over the project life cycle the degradation in module efficiency has become an established norm. Resultantly, the Commission has considered 0.50% degradation by accordingly adjusting the CUF over the useful life of the project.

f) **DEBT- EQUITY RATIO –**

The Petitioner has claimed Debt-Equity Ratio of 70:30 as per the RE Regulations, 2017. However, the Commission may call for necessary details/ documents establishing actual equity infused by the Petitioner in the instant Project and in the event the equity is found lesser than 30%, the Petitioner shall not be unjustly enriched by inclusion of Return on equity on amount higher than the actual equity of the present project.

g) **RATE OF INTEREST ON CAPITAL LOAN AND WORKING CAPITAL** -

Average MCLR of SBI prevailing during last 6 months plus of 100 basis points may be considered by this Commission.

h) **OTHER PARAMETERS OF THE PLANT** -

The normative figures provided in the Regulations are the ceiling parameters. In view therefore, reasonable figures with ceiling of normative parameter may be considered by the Commission with respect to Return on Equity (RoE), Deprecation and Working Capital for determination of tariff of the Plant of the Petitioner.

i) **PRAYER FOR AMENDMENT OF PPA IS UNTENABLE -**

The Petitioner in the present Petition for determination of tariff has also prayed for amendment in the PPA already executed. The Commission had already adjudicated upon the similar prayer made by other similarly placed solar power developers in Order dated 03.11.2020 passed in PRO - 52 of 2020 and PRO - 55 of 2020, by rejecting the same.

Reply of the Generator:

(A) Regarding, comparison with the Mirzapur plant of Petitioner, it is submitted that:-

i) The Petitioner has incurred a total cost of INR 286 Crores towards construction of 50 (AC)/75 (DC) MWp Solar Power Plant in Mirzapur, Uttar Pradesh. A certificate from independent Chartered Accountant in support is enclosed.

ii) The cost claimed by the Petitioner for the 50 (AC)/75 (DC) MWp project in Bhiwani, Haryana is INR 275.4 Crores, which is lower by INR 10.6 Crores compared to the cost of INR 286 Crores towards construction of the plant in Mirzapur, Uttar Pradesh.

iii) The construction timeline for Haryana is longer than Uttar Pradesh, owing to regulatory delays including execution of Connectivity Agreement, COVID 19 pandemic situation. The increase in construction period has a direct impact on the interest during construction and land lease cost capitalized.

(B) The comparison of tariff proposed by the Petitioner with the tariff of Rs. 2.36 per unit discovered in 2.0 GW of SECI ISTS tender is not a correct and fair comparison.

The Hon'ble Commission is requested to note that tariff of a project is a function of the following parameters:

i) Irradiation at the Project Location

ii) Duty rates applicable on the PV modules

iii) Size of the Project

iv) Project construction timeline

v) Cost of Land

vi) Length of transmission line

vii) Credit Rating of the off taker which directly impact the financing terms and the interest rate of the loan.

(C) Capital cost justification:

i) The details have been provided and it is for this Commission to consider all costs allowed under its Regulations.

ii) The detailed breakup of Rs. 38.91 Crores, which is yet **to** be spent by the Petitioner is as under:

Sl. No.	***Amounts (Rs. Cr.)***	***Details***
1.	15	The quantum of works which were completed and certified however invoices haven't been raised
2.	18.2	Punchlist works such as RO, Civil works, PR Test for which billing will be done at or after commissioning
3.	2.1	Amount was held back from the EPC contractor of evacuation infrastructure towards final commissioning and testing.
4.	1.1	To be paid for retesting of the entire equipment of PV area such as IDTs, inverter cables, panels, PSS for power transformers and control panels at the time of final commissioning
5.	0.87	To be spent towards preservation of the plant, as the PV plant was fully installed and ready for commissioning since September 2020
6.	1	Pertains to services availed from engineers for construction of the plant.
7.	0.64	Pertains to the amounts that are payable to multiple vendors.
8.	38.91	**Total**

iii) As regards, the IDC incurred by the Petitioner, the timeline for implementation of Petitioner's project was impacted by the delay in execution of Connectivity Agreement that was first submitted for execution in September 2019. This has resulted in an increase in IDC of the Project , any increase in IDC has a cascading effect on the Project Cost.

iv) Further, the Financing Cost as considered and submitted by the Petitioner in the Project Cost, has been computed considering only the fees to be paid to lenders for disbursement of the loan. The cost of Debt Service Reserve Amount ("**DSRA**") to be created as part of Financing Costs has been inadvertently missed out in the submission made to the Commission in Petition filed on 13.10.2020. In this regard it is noteworthy that the creation of DSRA equivalent to upcoming 2-3 quarters of Debt service amount is a standard requirement from the lenders. Therefore, the Petitioner requests the Commission to allow inclusion of DSRA equivalent to the upcoming two quarter debt service requirements amounting to Rs. 16.6 Crore in the Project Cost considered for Tariff calculation. To reflect the increase in cost due DSRA to be created at the time of financing the tariff needs to be increased by 19 paisa/kWh.

v) The Respondent No. 1 has wrongly contended that the price for solar projects need to be aligned to the market prices. There are no available market prices for solar projects except as determined by this Commission on case-to-case basis as per the HERC RE Regulations, 2017.

vi) The Commission is also requested to note that the Petitioner has applied for determination of project specific tariff under Section 62 and hence, the consideration of capital cost should be based on actual cost incurred by the Petitioner for development of the Project.

vii) Apart from the above, Respondent No.1 has also relied upon capital cost and per unit tariff arrived at by various State regulators, KUSUM Scheme et. al. In response to the same it is submitted that:

(i) The Capital Cost considered under the PM KUSUM scheme of Rs. 3.4 Crores per MW is lower than the actual cost incurred by developers. The cost of Rs. 3.4 Crores per MW under PM KUSUM Scheme does not provide the details of break-up of the capital cost across various heads.

(ii) The benchmark cost of Rs. 3.56 Crore proposed by Uttarakhand Electricity Commission is considering an exchange rate of Rs. 70.735/USD whereas the rupee has depreciated significantly during year 2020 on account of the unprecedented ongoing COVID-19 pandemic situation and it is not a business as usual condition.

(iii) With regards to the cost of Rs.3.65 Crores considered by RERC, it may be noted that it does not account for cost of land and cost of interest during construction of the project.

(iv) As regards, the capital cost of Rs. 3.50 Crore per MW proposed by KERC doesn't provide the details of costs that have been considered and is basis the assumption that no duties are applicable on Solar PV Modules. However, the Commission is requested to note the Ministry of Finance has released a notification during July 2018 which imposed safeguard duty on solar PV modules. Therefore, the project cost proposed KERC does not account for all the cost components and cannot be compared with current Project cost.

(D) O&M justification:

i) The Draft Tariff Regulations issued by Commission cannot be relied upon by the Respondent for O&M Expenses. The Petitioner had computed O&M expenses in accordance with the extant Regulation 17(1) of the HERC RE Regulations, 2017.

ii) Further, Regulation 17(1) clearly provides that O&M Expenses shall comprise repair and maintenance (R&M), establishment including employee expenses and administrative expenses. In addition, the definition of Operation and Maintenance expense in Chapter 1 of the HERC Tariff Regulations includes cost for insurance as well. The cost of INR 0.58 Million per MW includes the cost of insurance which is INR 0.09 Million per MW. Excluding the insurance cost the O&M cost proposed by the Petitioner is INR 0.49 Million per MW.

iii) As regards the allegation of the Respondent that the O&M quotes have been obtained from only a handful of vendors, it is submitted that the vendors from whom the O&M quotes have been obtained are market leaders, together the vendors have more than 23% market share in the Indian Solar Plant Operations and Maintenance i.e.:

(a) First vendor, i.e., M/S Sterling and Wilson Solar Ltd. Performs O&M activity for a total capacity of 7.8 GW across countries of which 5.8 GW is in India

(b) Second vendor, i.e., M/S Mahindra Teqo Pvt. Ltd. Manages a portfolio of 2.5 GW of solar projects

iv) The costs proposed by the vendors are after considering the standards that have to be maintained to keep the plant operations at optimal level so as to meet the PPA terms with respect to generation.

v) That the O&M cost for a solar plant is a function of the following:

- (a) Manpower costs of the region
- (b) Minimum wages applicable in the state
- (c) Water availability / transportation costs
- (d) Size of the plant
- (e) Equipment Configuration
- (f) Transmission line maintenance

vi) That the price quoted by vendors depends on the scope of work/services defined under the contract such as inclusion of warranties, maintenance and refurbishment of spares, security services and manpower supply. Considering the above, the comparison of O&M costs of plants located across country will not be a right representation of O&M cost to be incurred by the Petitioner for the plant under consideration.

vii) On the issue of, Land Lease cost, it is submitted that it is a known fact that the same varies significantly from location to location on account of various factors which are not within the reasonable control of the Petitioner. The Petitioner has already provided the details of long-term land lease agreements executed with various farmers along with the Petition to the Hon'ble Commission. The Hon'ble Commission is requested consider the Land Lease cost as submitted by the Petitioner.

viii) The Respondent's contention of not allowing the escalation of 5.72% on O&M Expenses as being on higher side considering the trend of volatility in Indices over the past 7 years is misplaced and is an indirect challenge to the Regulations, which is impermissible. The Tariff has to be allowed on the basis of the extant Regulations which are binding on all the stakeholders as well as the Commission as held in Constitution Bench Judgment in PTC v CERC (2010) 4 SCC 603 (Para 58). As iterated at the beginning, the tariff computation by the Petitioner is done basis Regulations binding at the time of filing of the Petition and the same has to be used for Tariff determination.

ix) The base O&M cost considered by the Petitioner, doesn't take into account replacement of equipment such as inverters, transformers, SCBs etc., due to wear and tear. It may be noted that warranties of most of the equipment used in development of a solar power plant except for modules is only for 5 years. The developer needs to incur a substantial cost towards replacement of the equipment post the warranty period which is not currently accounted in the base O&M cost considered.

(E) CUF:

i) Based on the PVSYST simulations for the Project, the CUF is estimated to be 17.27% DC (25.91% CUF AC).

ii) The Petitioner understands that M/S Haryana Power Generation Company Ltd. operates a plant in Haryana where in the DC CUF is in the range of 16.5% to 16.7% on a comparable basis.

iii) With respect to the comparison with the details shared by M/S LR Energy in its DPR, the Commission is requested to note the DC/AC ratio for the Petitioner's plant is 1.50 whereas that for the plant of M/S LR Energy is 1.20. It may be noted that the solar power plants with a higher DC/AC ratio have comparatively higher inverter overload losses and grid limitation losses which will result in a lower DC CUF but a higher AC CUF of the plant. The correct comparison is on the basis of AC CUF that provides optimum utilization of AC side transmission infrastructure. The AC CUF for the Petitioner's plant is 25.52% which is higher than 22.55% of M/S LR Energy's plant.

iv) The Commission in its Order dated 20.12.2019 passed in HERC/PRO- 57 of 2019 for purchase of power under KUSUM scheme, has considered a CUF of 20% AC. The AC CUF proposed by the Petitioner at 25.52% is higher than that considered by Commission.

v) With reference to the guideline CUF mentioned by KERC, the indicated value is the CUF with respect to the AC capacity (50MW in this case), the same is being achieved by the Petitioner as indicated in the above point.

vi) The grid unavailability is assumed as 1% as the Clause 12.3 of the approved Draft PPA does not provide for any compensation if the grid unavailability is upto 1%.

vii) As mentioned above, the adjustment of 1% considered by the Petitioner is against the loss due to grid unavailability against which no compensation is provided in the Draft PPA.

(F) Debt-Equity Ratio

i) The capital infused by shareholders of the Petitioner is Rs. 109.4 Crores, which is 39.7% of the total project cost of Rs. 275.4 Crore.

(G) Rate of Interest on Capital Loan and Working Capital

The Petitioner is currently, in the process of raising a Capital Loan and Working Capital Loan for the current Project. Hence, for present, the same has been considered as per HERC Tariff Regulations. The Petitioner reserves its rights to make further submissions in this regard at the time of hearing.

Commission's View:

The Commission has taken note of the objections and reply thereto. The same shall be kept in mind while determining tariff in the present case.

Commission's Analysis and Order

5. The Commission heard the arguments of the parties at length as well as perused the written submissions placed on record by the parties. The Commission has carefully examined the Regulations occupying the field. Second Proviso to Regulation clause no. 47 of HERC RE Regulations, 2017 provides that the norms including Capital Cost, CUF, Auxiliary Energy consumption, O&M expenses shall be determined on the basis of prevalent market trend. The broad guidelines of the relevant regulations are as under: -

***"48. Capacity Utilization Factor*. –** *The Capacity utilization factor for Solar PV project* *shall be 19%. Provided that the Commission may deviate from above norm in case of project specific tariff determination.*

49. Operation and Maintenance Expenses. –

(1) The O&M Expenses shall be determined based on prevalent market conditions.

(2) Normative O&M expenses allowed at the commencement of the Control Period under these Regulations shall be escalated at the rate of 5.72% per annum.

50. Auxiliary Energy Consumption. – *The auxiliary energy consumption shall be 0.25% of the gross generation."*

The Commission is inclined to accept the contention of the Petitioner that the Regulations in vogue as of now shall be reckoned with, till the time Regulations are amended. Hence, the annual escalation factor shall be 5.72%.

The Commission, while giving its mind on the issue of CUF raised by the intervener, has already taken a view that the CUF as proposed by the Petitioner shall be considered for tariff determination.

The Commission shall now proceed to examine and decide each component relevant for determination of tariff in the present case:-

a) **Capital cost:**

The Petitioner has claimed capital cost of Rs. 2754 Million, on the basis of certificate from a Chartered Accountant, as detailed below:-

SNo.	Head	Rs. Million
1	Capital work incl. plant and machinery	1,983.00
2	Civil Works, erection and commissioning	227.60
3	Financing Cost	32.70
4	Interest during construction	95.90
5	Evacuation infrastructure up to interconnection point including GSS bay in the HVPNL substation	152.90
6	Land lease rentals capitalized during the construction phase as per lease agreement	24.40
7	Project Management Expenses	237.50
	Total	2,754.00

Key components used in the project has been detailed by the Petitioner, as under:-

Sr. No.	Item	Specifications	Status of the Work
1.	Modules	5. Adani – 340 W –97560 Nos. 6. Adani – 335 W –12930 Nos. 7. Trina – 345 W –71730 Nos. 8. Trina – 340 W –37530 Nos.	Modules equivalent to DC capacity of 75 MWp are installed at the site as per the design specifications
2.	Inverters	3. Sungrow Central Inverters - 3125 kW – 10 Nos. 4. Huawei String Inverters - 160kW	50 MW AC capacity has been installed

			– 117 Nos.	
3.	Evacuation Infrastructure	3. 4.	Bharat Bijlee Transformers – 33 kV/132 kV – 1 Nos. Transmission Line – 1.5 KM single circuit transmission line on double circuit tower	The transmission line from the solar project is connected to the terminal bay of Khanak, HVPNL grid substation

Per-contra, HPPC has vehemently countered the claim of the Petitioner for exorbitant capital cost claim of Rs. 2754 Million, citing Orders of various State Commissions, wherein capital cost per MW has been approved, as summarized hereunder:-

1. Uttarakhand Electricity Regulatory Commission in Order dated 07.06.2019 (Petition No. 18 of 2019) for review of the Benchmark Capital Cost for Solar PV Plants to be applicable for FY 2019-20 had approved total Capital Cost of Solar PV plants as Rs. 3.56 crore/ MW, after considering GST and Duties and without land cost the same is Rs. 3 crore/MW.
2. The Commission in its Order dated 20.12.2019 (PRO-57 of 2019), in the Petition for determination of levelized tariff for purchase of power from decentralized Solar Power Plants set up under PM KUSUM Scheme, upto 2 MW, has determined Capital cost for the Solar Projects at Rs. 3.40 crore/ MW. The said cost included cost of the Land, evacuation system as well besides monetised value attributed to degradation of solar panels. Further, the PM Kusum scheme tariff is for the plants upto 2.0 MW only. The said tariff ought to be further reduced for large scale Megawatt projects.
3. RERC) in their order dated 11.02.2020, while determining tariff under PM KUSUM scheme, has determined the cost of setting up 1 MW solar plant along with 3 kM 11 kV connected line as Rs. 3.65 Crores per MW.
4. KERC, vide its order dated 1.08.2019 has approved the Capital Cost of Rs. 3.17 crore/ MW excluding the cost of Land, for project capacity of less than 5 MW. The said cost takes into account the fact that the report given by PV insight as on 22.04.2019 evincing average module cost at about Rs. 14.89/watt.
5. MNRE vide Office Memorandum dated 21.07.2020 has notified benchmarking cost for Grid connected Rooftop Solar Photo voltaic systems (RTS) ranging from 100 kW to 500 kW for the FY 2020-21 as Rs. 36 per Watt. The cost of solar plant considering this standard is Rs. 3.6 crores per MW even though the increase in capacity of Plant shall further decrease the cost of Project substantially.

Ms. Neelam Singh, in its objections filed in the present matter has also highlighted the generator has claimed total project cost of Rs. 275 crores for 50 MW Project which works out to Rs. 5.5 crores/MW, without the cost of land which the generator has taken on lease. The intervener, relying on the Order of the Commission dated 20.12.2019 (PRO-57 of 2019) in KUSUM scheme and MNRE Order dated 21.07.2020 determining benchmarking cost of grid connected RTS, has suggested that in the current scenario the cost of large scale grid connected solar plant is about Rs. 2.5 to 3.0 crores/MW only.

The Commission has carefully examined the contentions of the parties and observes that Uttarakhand Electricity Regulatory Commission (UKERC), vide its Order dated 07.06.2019 (Petition No. 18 of 2019), has approved the benchmark capital cost for Solar PV Plants to be applicable for FY 2019-20, after inviting comments/objections from various stakeholders. The benchmark Capital Cost of Solar PV plants was approved as Rs. 3.56 crore/ MW. The break-up of the said cost is summarized as under :-

S.No.	Particulars	Approved Cost for FY 2019-20 Rs. Lakh/MW
1.	PV module	224.85
2.	Land Cost	50.00
3.	Civil and General Works	14.22
4.	Mounting Structure	14.93
5.	Power Conditioning Units	14.93
6.	Evacuation cost upto interconnection point (cables and transformers)	18.77
7.	Preliminary and Pre-operative Expenses (5.21% of total capital cost)	18.57
TOTAL		**356.27**

The UKERC, vide its Order dated 05.10.2020, extended the applicability of the ibid Order, up to March, 2022. The benchmark capital cost so determined is after considering the degradation cost of Rs. 8.84 Lakh/MW over the life of the project, GST and safeguard duty.

Further, the Commission in its Order dated 20.12.2019 (PRO-57 of 2019), while determining levelized tariff for purchase of power from decentralized Solar Power Plants set up under PM KUSUM Scheme, upto 2 MW, has determined Capital cost for the Solar Projects at Rs. 3.40 crore/ MW. The said cost included cost of the Land, evacuation system as well besides monetized value attributed to degradation of solar panels.

As against this, the Petitioner has claimed the capital cost as tabulated hereunder:-

S. No.	Particulars	Amount in INR Crore		
		Cost Already Incurred	Cost to be incurred	Total Costs
1	**Land cost capitalized during construction phase as per lease agreement**	**2.38**	**0.06**	**2.44**
2	**Capital work including plant and machinery**	**170.36**	**27.94**	**198.30**
2 (a)	Module and Related cost	132.01	-	132.01
2 (b)	Inverter	2.08	-	2.08
2 (c)	Plant and Machinery-Others	35.32	27.94	63.27
2 (d)	Other expenses	0.96	-	0.96
3	**Civil work, erection and commissioning**	**14.68**	**8.08**	**22.76**
3 (a)	Civil Work	12.36	8.05	20.41
3 (b)	Consultancy	0.99	0.03	1.02
3 (c)	Studies and investigations	0.38	-	0.38
3 (d)	Statutory fees	0.78	-	0.78
3 (e)	Insurance	0.09	-	0.09
3 (f)	Other expenses	0.08	-	0.08
4	**Evacuation Infrastructure**	**12.40**	**2.89**	**15.29**
4 (a)	Power Transformer	2.72	-	2.72
4 (b)	Evacuation Infrastructure Others	9.61	2.89	12.50
4 (c)	Other expenses	0.07	-	0.07
6	**Financing Cost**	**-**	**3.27**	**3.27**
7	**Interest During Construction**	**6.67**	**2.93**	**9.59**
8	**Project Management Fee**	**19.49**	**4.26**	**23.75**
	Total	**225.97**	**49.43**	**275.40**

The Commission observes that the Petitioner has stated that normative capital cost should be Rs. 36.70 Million/MW. However, the Petitioner has claimed the same for DC capacity of 75 MW, as against the contracted AC capacity of 50 MW. The Commission has perused the CERC Order dated 23.03.2016, in the matter of determination of Benchmark Capital Cost Norm for Solar PV power projects and Solar Thermal power projects applicable during the FY 2016-17, wherein the Central Commission has decided that capital cost has to be reckoned with on AC capacity and not on DC capacity, as additional modules are deployed by some developers to optimize the performance of the plant, especially the inverters and additional units of electricity are generated with the extra module capacity, resulting in higher earnings from feed-in-tariff. The remuneration due to additional units generated sufficiently covers additional costs in such a case. Accordingly, the module & related cost amounting to Rs. 132 crore for 75 MW is reduced to proportionate cost for 50 MW, which comes to Rs. 88 Crore (reduced by Rs. 44 Crore).

Similarly, Civil work cost amounting to Rs. 20.41 crore for 75 MW is reduced to proportionate cost for 50 MW, which comes to Rs. 13.60 Crore (reduced by Rs. 6.81 Crore).

Further, the Petitioner could not substantiate that the capital cost of Rs. 2754 Millions claimed by it in its Petition, with respect to 50 MW AC capacity, is the ideal/minimum cost which was essentially required to be incurred backed by quotes from more than three vendors etc. In absence of the same and given the huge capital cost of Rs. 55.08 millions/MW claimed by the Petitioner as against the benchmark capital cost of Rs. 35.62 Millions/MW determined by Hon'ble UKERC and Rs. 34 Million/MW determined by this Commission in its Order dated 20.12.2019 for small projects, the Commission is not convinced regarding its prudence i.e. incurrence of capital cost after taking all economic safeguards and negotiations.

It needs to be noted that while claiming/ determining project specific tariff, the Petitioner as well as this Commission ought not to escape the rigor of prudence check including the market trend in India. The ridiculously low cost offered by the Chinese firm in the global market also needs to be discounted given the inherent disadvantages in India, across the solar value chain.

Further, the capital cost claimed by the Petitioner includes Project management expenses of Rs. 23.75 crore, which has been paid to its group companies/ related parties i.e. M/s. Amplus KN one Power Pvt. Ltd. and M/s. Amplus Management Services Pvt. Ltd., having the same address as that of the Petitioner. The Commission does not find any convincing reason to incur such huge amount on Project Management, that too by making payment to its group companies, when it admittedly already owns and manages a portfolio of 800+ MWp of operational and under construction solar assets across 24 States of India with projects spread over more than 400 locations. The claim to this effect of the Petitioner is not justified and the Petitioner should have exercised due diligence including leveraging its expertise and vast experience in avoiding such expenses. Therefore, the Commission is not inclined to accept the Project Management expenses of Rs. 23.75 Crore as part of capital cost.

The Petitioner has claimed Interest during construction period, amounting to Rs. 9.59 Crore. However, the Commission observes that the Petitioner has not

borrowed funds for the project. Even, interest on term loans as part of operating expenses has been claimed considering norm of 70:30. The Petitioner is not allowed to claim Return on Equity during construction period i.e. return on own capital employed during construction period. The Equity deployed is eligible for return only when the assets enter revenue earning stream and power is generated subsequent to the CoD. Accordingly, the Commission is not inclined to accept the claim of the Petitioner towards interest during construction period.

It is observed that the Hon'ble UKERC has determined benchmark capital cost of Rs. 35.62 Millions/MW considering the land cost, degradation cost of Rs. 8.84 Lakh/MW over the life of the project, GST and safeguard duty. Further, the Commission in its Order dated 20.12.2019 has determined Rs. 34 Million/MW as capital cost for small projects. The Commission has further observed that the Petitioner has not provided any corroborative evidence in support of the cost higher than these benchmarks, incurred by it. Accordingly, the Commission is convinced that the Petitioner in its own wisdom has opted for such higher cost. The argument that the project was originally conceived for third party / captive role / consumption and hence state of the art technology / configuration was used leading to higher capital cost is also flawed. The Commission is of the considered view that while setting up any such project, the fact that the energy generated is to be sold to a third party or a Discom ought not to make any difference to the Capital Cost.

Resultantly, the Commission approves total cost of 50 MW power plant at Rs. 191.25 Crore (Rs. 275.40 Crore claimed by the Petitioner minus Rs. 44 Crore toward cost of modules of 25 MW, minus Rs. 6.81 Crore towards cost of civil work of 25 MW, minus Rs. 23.75 Crore as Project Management expense, minus Rs. 9.59 Crore as interest during construction period), for the purpose of tariff determination, which works out to Rs. 38.25 Million/MW. The capital cost of Rs. 38.25 Million/MW is still comparatively higher, however, given the benefit of higher CUF of 25.91% (AC) proposed by the Petitioner, the Commission considers the same as reasonable.

b) **CUF:**

The Petitioner has submitted that based on the PVSYST simulations for the Project, CUF is estimated to be 17.27% DC (25.91% CUF AC). The CUF is further adjusted for 0.5% of plant unavailability and 1% of grid unavailability leading to a CUF of 17.01%

(25.52% CUF AC) which is used for tariff determination. The Petitioner has claimed that higher CUF claimed by it is due to the efficient design capabilities of the Petitioner. **The Commission observes that HERC RE Regulations, 2017, specifies the minimum acceptable capacity utilization factor for solar PV power projects. Thus, there is no bar on the claim of the Petitioner of higher CUF @ 25.91% AC, due to its efficient design. Accordingly, the Commission approves CUF @ 25.91% AC, as proposed with annual degradation of 0.50%.**

c) **Operation and Maintenance (O&M) Expenses:**

The Petitioner has submitted that in order to ascertain the prevalent market conditions, the Petitioner has obtained quotes from two reputed O&M contractors for the comprehensive operation and maintenance of the Project:

Sr. No.	Name of the O&M Contractors	Base O&M (excl. GST)	GST (18%)	Total O&M (incl. GST)	Total O&M per MWp
		Rs. Million per annum	Rs. Million	Rs. Million per annum	Rs. Million per annum
1	M/s Sterling and Wilson Solar Limited	32.6	5.9	38.5	0.51
2	M/s Mahindra Teqo Private Limited	29.1	5.2	34.3	0.46

Further, insurance quotes were obtained from the following insurance companies:-

S No.	Name of the Insurance Vendor	Base (excl. GST)	GST (18%)	Total Insurance (inc. GST)	Total Insurance per MWp
		Rs. Million per annum	Rs. Million	Rs. Million per annum	Rs. Million per annum
1.	HDFC Ergo	5.82	1.05	6.87	0.1
2.	Bajaj Allianz	5.86	1.06	6.92	0.1
3.	ICICI Lombard	5.90	1.06	6.96	0.1

Though the Petitioner in its petition has claimed average of the quotes received from O&M Contractors from Insurance companies leading to an aggregate Operating and Maintenance expense of Rs. 43.3 Million per annum, Shri Sanjeev Aggarwal, MD & CEO of the Petitioner, during the course of hearing conceded that they would claim the O&M expenses equivalent to the least cost quotes received by them.

Per-contra, HPPC has submitted that the KERC in its Order dated 01.08.2019, has considered O&M expenses inclusive of insurance and all allied expenses as Rs. 4.50 Lakh/ MW for ground mounted Megawatt Scale Solar Plants upto 5 MW. The said cost is further liable to be discounted for High capacity Solar Plants as the O& M cost per MW does not increase at the same proportion with the increase in the capacity of the Plant.

In this regard, the Petitioner has submitted that the vendors from whom the quotes were received are market leaders and are after considering the standards that have to be maintained to keep the plant operations at optimal level so as to meet the PPA terms with respect to generation.

The Commission observes that Regulations clause 49 (1) of the HERC RE Regulations specifies that O&M Expenses shall be allowed based on prevalent market conditions.

In view of the above and also the observations of the Commission while deliberating on the issue of O&M raised by the intervener, the Commission approves O&M expenses of Rs. 0.303 Million / MW inclusive of Insurance and all taxes and levies for 50 MW project, for first year. Thereafter, the same shall be escalated @ 5.72% per annum.

d) **Lease Rentals:**

The Petitioner has already entered into lease agreements with the landowners of the land on which the Project is installed. The Project, as submitted, uses a total of 260.1 acres of land which is leased by the Petitioner at Rs. 10.99 Million of lease rental which is applicable for the period between 01.11.2020 and 31.10.2021, and shall escalate at 5% per annum.

Considering the essentiality of the same for the project and being claimed on the basis of actual, the Commission is inclined to accept the same as proposed.

e) **Interest rate on Term Loan & Working Capital:**

The Commission is not convinced with the submissions of the Petitioner on this issue. The Commission believes that going forward due to the inflation rate and larger access to funds for project finance, the interest rates is expected to seek lower levels. The Commission has examined the relevant provisions of HERC RE Regulations, 2017 which provides that the interest rate shall be considered as the average Marginal Cost of funds-based lending rate (MCLR) (one-year tenor) of SBI prevailing during the last available six months plus a margin of up to 200 basis points i.e. 2%.

The Commission observes that average of SBI MCLR (one-year tenor) of SBI during the last six months i.e. July-December, 2020, works out to 7.00%. Consequently, in line with the HERC RE Regulations, 2017, the Commission

approves interest on term loan & working capital, as 9% (i.e. Average SBI MCLR (one-year tenor) plus a margin of up to 200 basis points). Accordingly, the discounting factor for working out levelised tariff shall be the weighted average cost of capital i.e. 10.50%.

f) **Other factors:**

Other factors relevant for determination of tariff shall be taken as per the norms specified in the HERC RE Regulations, 2017. Regulation No. 12, 13 & 15 of the HERC RE Regulations, 2017, provides as under:-

"12. Debt Equity Ratio. –

(1) For generic tariff to be determined based on suo motu petition, the debt equity ratio shall be 70: 30.

(2) For Project specific tariff, if the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan.

Provided that where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff. Provided further that the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment.

13. Loan and Finance Charges. –

(1) For the purpose of determination of tariff, loan tenure of 13 years shall be considered.

(2) (a) The loans arrived at in the manner indicated above 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 up to March 31st of the previous year from the gross normative loan.

(b) For the purpose of computation of tariff, the normative interest rate shall be considered as the average Marginal Cost of funds based lending rate (MCLR) (one-year tenor) of SBI prevailing during the last available six months plus a margin of up to 200 basis points i.e. 2%.

(c) Notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.

***15. Return on Equity*. –**

(1) The value base for the equity shall lower of the two either 30% of the capital cost or actual equity (in case of project specific tariff determination) as determined under Regulation.

(2) The normative Return on Equity shall be as under:-

a) 14% per annum calculated on normative Equity Capital.

b) MAT/Corporate Tax applicable shall be considered as pass through.

Provided that the applicable MAT / Corporate Tax shall be separately invoiced as per the actual paid at the rate as declared by the Income Tax Department. The Generator shall raise the bill for reimbursement of MAT / Corporate Tax applicable on Return on Equity in 12 equal installments which shall be payable by the beneficiaries."

The Commission has also examined the issue raised by the Petitioner for amendment in Clause 4.6 the already executed PPA between the Petitioner and the Respondent. The Commission observes that similar issue raised by other similarly placed generators in case nos. PRO - 52 of 2020 and PRO - 55 of 2020, was examined and rejected as devoid of merits, vide Order dated 03.11.2020. The relevant part of the Order dated 03.11.2020 is reproduced hereunder:-

" (i) Variation in Declared Cumulative Utilization Factor (CUF): it has been argued by the Ld. Counsel, appearing for the Respondent, that due to degradation in the Solar Module overtime by about 0.7% per annum, the variation in CUF could be anywhere between 10% to 15% as allowed by SECI and a few other States. Further, the actual variation can only be ascertained after CoD. While the Ld. Counsel, appearing for the Petitioner i.e. HPPC/DISCOMs, would argue that similar terms have earlier been incorporated and agreed to by the a few other solar developers including the project selected through competitive bidding route. Hence, there ought not to be any discrimination as such and no such issue was ever raised by the Generator. After careful perusal of the rival contentions, the Commission is of the considered view the all such solar power projects are set up or to be set-up in Haryana. Hence, the CUF is reckoned with after taking in to account the situation obtaining in Haryana. Further, the ground realities including solar irradiation level may also vary from one State to another. The CUF variation permitted in some other State / SECI ought not to be generalized as such. Resultantly, in order to maintain a level playing field for all the solar

power developers in Haryana, the Commission is not inclined to allow the relief sought on this issue. Accordingly, the same is rejected as devoid of merit."

Moreover, the present Petitioner for determination of tariff, in pursuant to already executed PPA between the Petitioner and HPPC.

In view of the above, the Commission rejects the prayer of the Petitioner for amendment in the PPA.

Based on the parameters discussed in the foregoing paras, the Commission determines the tariff for 25 years life of the project, appended to the present Order (Annexure – A). The tariff payable is the year to year tariff computed by the Commission for the entire life of the project.

In terms of the above Order, the present petition is disposed of.

This Order is signed, dated and issued by the Haryana Electricity Regulatory Commission on 18.01.2021.

Date: 18.01.2021	**(Naresh Sardana)**	**(Pravindra Singh Chauhan)**
Place: Panchkula	**Member**	**Member**

Annexure - A : Project Specific Levelized Tariff for Amplus Solar 50 MW - Solar PV Projects for 25 years

Table of Parameters	Per MW	50 MW
Capital cost (Rs. in Million)	38.25	1,912.50
Cost of Land (Rs. Million)		-
Remaining capital cost		1,912.50
Residual value (10%)		191.25
Total depreciation (Rs in Million)		1,721.25
Loan component (Rs in Million)		1,338.75
Equity component (Rs in Million)		573.75
Capacity Utilisation Factor (CUF) %		25.91%
Annual degradation in CUF		0.50%
O&M (Rs Million)	0.30	15.15
O&M escalation		5.72%
Depreication (first 13 years)		5.38%
ROE (1st 10 years)		14%
ROE (11th year onwards)		14%
Interest on term loan		9.00%
Interest on working capital		9.00%
Auxiliary consumption		0.25%
Discount rate WACC		10.50%
Levellised tariff (Rs / kWh)		2.48

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
O&M with Escalation (Rs. Million)		15.15	16.02	16.93	17.90	18.93	20.01	21.15	22.36	23.64	24.99	26.42	27.93	29.53	31.22	33.01	34.90	36.89	39.00	41.23	43.59	46.08	48.72	51.51	54.45	57.57
Outstanding Loan amount (Rs. Million)		1338.75	1235.77	1132.79	1029.81	926.83	823.85	720.87	617.88	514.90	411.92	308.94	205.96	102.98												
Loan repayment (Rs. Million)		102.98	102.98	102.98	102.98	102.98	102.98	102.98	102.98	102.98	102.98	102.98	102.98	102.98												
Interest on loan (Rs. Million)		115.85	106.59	97.32	88.05	78.78	69.51	60.24	50.98	41.71	32.44	23.17	13.90	4.63												
Working Capital (Rs. Million)																										
One month O&M & Lease Rental		2.18	2.30	2.42	2.55	2.69	2.84	2.99	3.15	3.32	3.50	3.70	3.90	4.11	4.33	4.57	4.81	5.08	5.35	5.64	5.95	6.27	6.61	6.97	7.35	7.75
2 Months receivables		55.10	53.77	52.46	51.16	49.88	48.61	47.36	46.13	44.91	43.72	42.54	41.39	40.25	27.93	28.42	28.93	29.47	30.04	30.64	31.27	31.94	32.64	33.38	34.17	34.99
Maintenance spares15% of O&M		2.27	2.40	2.54	2.69	2.84	3.00	3.17	3.35	3.55	3.75	3.96	4.19	4.43	4.68	4.95	5.23	5.53	5.85	6.18	6.54	6.91	7.31	7.73	8.17	8.64
Total		59.55	58.47	57.42	56.40	55.41	54.45	53.53	52.64	51.78	50.97	50.20	49.47	48.79	36.94	37.93	38.98	40.08	41.24	42.46	43.76	45.12	46.56	48.08	49.69	51.38
Interest on working capital		5.36	5.26	5.17	5.08	4.99	4.90	4.82	4.74	4.66	4.59	4.52	4.45	4.39	3.32	3.41	3.51	3.61	3.71	3.82	3.94	4.06	4.19	4.33	4.47	4.62

Parameters	**Derivation**	**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**
Capacity (MW)		**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**50**
CUF (%)		**25.91%**	**25.78%**	**25.65%**	**25.52%**	**25.40%**	**25.27%**	**25.14%**	**25.02%**	**24.89%**	**24.77%**	**24.64%**	**24.52%**	**24.40%**	**24.28%**	**24.15%**	**24.03%**	**23.91%**	**23.79%**	**23.67%**	**23.56%**	**23.44%**	**23.32%**	**23.20%**	**23.09%**	**22.97%**
Generation (Million Units)	A	113.49	112.92	112.35	111.79	111.23	110.68	110.12	109.57	109.03	108.48	107.94	107.40	106.86	106.33	105.79	105.27	104.74	104.22	103.69	103.18	102.66	102.15	101.64	101.13	100.62
Auxiliary Cons (%)		0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Generation (Ex-bus Mllion Units)	A1	113.20	112.64	112.07	111.51	110.95	110.40	109.85	109.30	108.75	108.21	107.67	107.13	106.59	106.06	105.53	105.00	104.48	103.96	103.44	102.92	102.40	101.89	101.38	100.88	100.37
Fixed Costs Computation (Rs. Million)																										
O&M Expenses		15.15	16.02	16.93	17.90	18.93	20.01	21.15	22.36	23.64	24.99	26.42	27.93	29.53	31.22	33.01	34.90	36.89	39.00	41.23	43.59	46.08	48.72	51.51	54.45	57.57
Lease Expenses	with 5% escalation	11.00	11.55	12.13	12.73	13.37	14.04	14.74	15.48	16.25	17.06	17.92	18.81	19.75	20.74	21.78	22.87	24.01	25.21	26.47	27.80	29.19	30.65	32.18	33.79	35.48
Depreciation		102.89	102.89	102.89	102.89	102.89	102.89	102.89	102.89	102.89	102.89	102.89	102.89	102.89	31.97	31.97	31.97	31.97	31.97	31.97	31.97	31.97	31.97	31.97	31.97	31.97
Interest on Term Loan		115.85	106.59	97.32	88.05	78.78	69.51	60.24	50.98	41.71	32.44	23.17	13.90	4.63												
Interest on Working Capital		5.36	5.26	5.17	5.08	4.99	4.90	4.82	4.74	4.66	4.59	4.52	4.45	4.39	3.32	3.41	3.51	3.61	3.71	3.82	3.94	4.06	4.19	4.33	4.47	4.62
Return on Equity		80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33	80.33
Total Fixed Cost (Rs. Million)		330.58	322.63	314.76	306.98	299.28	291.68	284.17	276.77	269.48	262.30	255.25	248.32	241.53	167.58	170.50	173.57	176.81	180.22	183.82	187.62	191.63	195.85	200.31	205.01	209.96
Tariff (Rs/kWh)		2.92	2.86	2.81	2.75	2.70	2.64	2.59	2.53	2.48	2.42	2.37	2.32	2.27	1.58	1.62	1.65	1.69	1.73	1.78	1.82	1.87	1.92	1.98	2.03	2.09
Per unit tariff components																										
Per unit O&M Expenses		0.13	0.14	0.15	0.16	0.17	0.18	0.19	0.20	0.22	0.23	0.25	0.26	0.28	0.29	0.31	0.33	0.35	0.38	0.40	0.42	0.45	0.48	0.51	0.54	0.57
Per Unit Depreciation		0.91	0.91	0.92	0.92	0.93	0.93	0.94	0.94	0.95	0.95	0.30	0.96	0.97	0.30	0.30	0.30	0.31	0.31	0.31	0.31	0.31	0.31	0.32	0.32	0.32
Per Unit Interest on term loan		1.02	0.95	0.87	0.79	0.71	0.63	0.55	0.47	0.38	0.30	0.22	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
Per Unit Interest on working capital		0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05
Per Unit Return on equity		0.71	0.71	0.72	0.72	0.72	0.73	0.73	0.73	0.74	0.74	0.75	0.75	0.75	0.76	0.76	0.76	0.77	0.77	0.78	0.78	0.78	0.79	0.79	0.80	0.80
Levellised tariff																										
Discount factor		1.00	0.905	0.819	0.741	0.671	0.607	0.549	0.497	0.450	0.407	0.368	0.333	0.302	0.273	0.247	0.224	0.202	0.183	0.166	0.150	0.136	0.123	0.111	0.101	0.091
Discounted tariff		2.92	2.59	2.30	2.04	1.81	1.60	1.42	1.26	1.11	0.99	0.87	0.77	0.68	0.43	0.40	0.37	0.34	0.32	0.29	0.27	0.25	0.24	0.22	0.20	0.19
Levellised Tariff (Rs/kWh)	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48	2.48