

BEFORE THE HARYANA ELECTRICITY REGULATORY COMMISSION AT PANCHKULA

**Case No. HERC/Petition No.- 16 of 2021, IA-13 of 2021 &
14 of 2021**

Date of Hearing : 22.09.2021
Date of Order : 11.11.2021

In the Matter of

Petition under Sections 62 of the Electricity Act, 2003 read with Regulation 6(1) (h), 7 and 47-50 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 at Village Mithi Surera, Taluka Ellenabad, District Sirsa, Haryana.

Petitioner M/s. Avaada Green HNProject Private 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 Deepak Khurana, Advocate

Present on behalf of the Respondents through Video Conferencing

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

Quorum

Shri R.K. Pachnanda
Shri Naresh Sardana

Chairman
Member

ORDER

Brief Background of the case

1. M/s. Avaada Green HNProject Private 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 its 50 MW Solar Power projects at Village Mithi Surera, Taluka Ellenabad, District Sirsa, Haryana.
2. **The petitioner has submitted as under:-**
 - a) That, the Commission had granted source approval to the HPPC vide its Order dated 03.11.2020 (Case No. HERC/PRO-52 of 2020), for procurement of 50 MW solar power

from M/s. Aavaada Green HNProject Pvt. Ltd., for 25 years at the tariff to be determined by the Commission.

- b) That consequent to the source approval, the petitioner entered into Power Purchase Agreement (PPA) with the Haryana Power Purchase Centre (HPPC) on 20.11.2020.
- c) That, in terms of the ibid Order of this Commission, the present petition is being filed for determination of Tariff under Section 62, 86(1)(b) and 86(1)(e) of the Electricity Act, 2003 read with Regulation 6(1)(h) of the HERC RE Regulations, 2017.
- d) Status of the Project: The Project is presently is in the final stage of completion. Following are the detail of the activities undertaken till date:-

LIST OF ACTIVITIES & STATUS		
S.No.	Package Description	Progress (%)
1	Topo survey & Soil Investigation	100
2	Area Grading	100
3	Chain Link Fencing	90
4	Piling & Pile Cap	96
5	Main Control Room	100
6	Inverter Station	100
7	Switch Yard Foundation	100
8	Roads & Drains	40
9	Transmission Line	47
10	Bay End ETC	45
11	Switch Yard Erection Testing and Commissioning	80
12	Electrical Equipment Erection	100
13	Solar Module Erection	-
14	MMS Erection	60
15	BOS AC	75
16	BOS DC	75

- e) The petitioner has committed investment, including investment already made, amounting to Rs. 189.04 crores towards construction of the project. Accordingly, the petitioner has calculated tariff in accordance with the HERC RE Regulations, 2017.
- f) The parameters for tariff determination, has been proposed as under:-
- i) capital cost – The relevant details including break-up of capital cost items as well as cost of land, as per sale deeds, in line with the first proviso to Regulation 11 of the HERC RE Regulations, 2017, has been submitted as under:-

SN	Particulars	Cost Committed (INR)	Cost to be incurred (INR)	Total Cost (INR)	Documentary Evidence
1	Solar Module and related cost	98,32,36,250	0	98,32,36,250	Cost will be substantiated by PO/PO Acceptance
2	Power Conditioning Unit	5,17,12,500	21,00,000	5,38,12,500	Cost will be substantiated by PO/invoice, cost incurred as on date.
3	Plant & machinery	14,36,44,925	68,48,104	15,04,93,029	Cost will be substantiated by PO/invoice, cost incurred as on date.
4	Site Expense	1,01,93,625	39,23,832	1,41,17,456	Cost will be substantiated by PO/invoice, cost incurred as on date.

5	Civil works	22,58,88,633	3,77,83,136	26,36,71,769	Cost will be substantiated by PO/invoice, cost incurred as on date.
6	Studies & Investigation	28,60,120	-	28,60,120	Cost will be substantiated by PO/invoice, cost incurred as on date.
7	Statutory fees	18,16,700	26,63,406	44,80,106	Cost will be substantiated by PO/invoice, cost incurred as on date.
8	Other Expense inclusive of Insurance/tools & tackles/establishment/security services	1,21,02,033	33,95,167	1,54,97,200	Cost will be substantiated by PO/invoice, cost incurred as on date.
9	Evacuation Infra	11,99,37,497	97,76,609	12,97,14,107	Cost will be substantiated by PO/invoice, cost incurred as on date.
10	Cost incurred for Corporate Engineering and Procurement	1,89,57,227		1,89,57,227	As per salary of site/HO employees
11	Cost incurred for purchase of land through sale deeds	20,52,48,334		20,52,48,334	Sale deed and land advances
	Sub Total	1,77,55,97,844	6,64,90,253	1,84,20,88,097	
	IDC	4,66,09,443	17,45,369	4,83,54,813	
	Total	1,82,22,07,287	6,82,35,622	1,89,04,42,909	

- ii) Debt Equity Ratio: The petitioner has proposed Debt-Equity Ratio of 70:30, in line with the HERC RE Regulations, 2017. Hence, a Debt-Equity ratio of 70:30 is considered for the 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. Millions
Capital Cost		1890.443
(A) Debt	70%	1323.310
(B) Equity	30%	567.133

- iii) Loan and Finance Charges: It has been submitted that as per Regulation 13 (1) of the HERC RE Regulations, 2017, loan tenure shall be considered as 13 years. Accordingly, the loan term of 13 years has been proposed for tariff computation. Further, regulation 13 (2)(b) of the HERC RE Regulations, 2017, provides that the normative interest rate shall be considered as the average Marginal Cost of funds-based lending rate (MCLR) one-year tenor of State Bank of India prevailing during the last six months plus a margin of up to 200 basis points (2%). In line with the same, interest rate of 9% has been proposed for computation of tariff.
- iv) Depreciation: In terms of Regulation 14 (1) of the HERC RE Regulations, 2017 i.e. 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. Accordingly, the petitioner has proposed 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.

- v) Return on Equity: As per Regulation 15 (1) of the HERC RE Regulations, 2017, the value base of equity shall be lower of the two i.e. either 30% of the capital cost or actual equity (in case of project specific tariff determination). 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 petitioner prays that the Commission may allow 14% return on eligible equity and MAT / Corporate Tax may be allowed as a pass through on actual basis.

- vi) Interest on Working Capital: Regulation 16(1) of the HERC RE Regulations, 2017, provides that the working capital requirement of Solar PV 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.

The petitioner herein has accordingly estimated working capital requirement by considering rate of interest as 9%.

- vii) Operation and Maintenance Expenses (O&M): Regulation 17 (1) of the HERC RE Regulations, 2017, provides that the O&M expenses shall comprise of repair and maintenance (R&M), establishment including employee expenses and administrative expenses. Additionally, Regulation 49 (1) of the of the HERC RE Regulations, 2017 provides that 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 Commission during commencement year of the HERC RE Regulations 2017, shall be escalated at 5.72% per annum.

The petitioner has provided break up of O&M cost based on detailed scope of comprehensive O&M. It has been prayed that the same may be approved considering the escalation provided under the O&M agreement.

SIRSA 50 MW Annual O&M Cost					
	Particulars	Base Cost	With GST	Per MWp Base Cost	Per MWp Cost with GST
1	Manpower Expenditure	39,44,000	46,53,920	56,343	66,485
2	Module Cleaning Exp	10,12,000	11,94,160	14,457	17,059
3	Security Cost	48,24,000	56,92,320	68,914	81,319
4	Staff Overhead Exp	28,60,000	33,74,800	40,857	48,211
5	Site Expense	12,92,000	15,24,560	18,457	21,779
6	Plant Maintenance	22,00,000	25,96,000	31,429	37,086
7	Insurance	29,50,000	34,81,000	42,143	49,729
8	Mandatory Expense	38,20,000	45,07,600	54,571	64,394
9	Misc. Expense	3,00,000	3,54,000	4,286	5,057
	Total Cost	2,32,02,000	2,73,78,360	3,31,457	3,91,119

The petitioner has placed on record the details of Operation and Maintenance charges considered by some of regulatory commissions, in the recent times as under:

SN	Relevant Commission	Operations and Maintenance expenses per MW (IN LAKHS)	Reference Order
1.	Tamil Nadu Electricity Regulatory Commission	4.69	Order No. 5 of 2019 dated 29-03-2019
2.	Joint Electricity Regulatory Commission (State of Goa and Union Territories)	7.50	Suo-moto Petition No. : JERC/LEGAL/MISC. P/12/2020 – Order dated 26.05.2020
3.	Himachal Pradesh Electricity Regulatory Commission, Shimla	8.74	Suo-Motu Petition No. 79 of 2020 – Order dated 13.11.2020
4.	Punjab State Electricity Regulatory Commission	4.50	Petition No. 08 of 2020 – Order dated 09.10.2020

In view of the above, the petitioner has prayed that the Commission may consider aggregate and comprehensive Operations and Maintenance expense of the first year as Rs. 3.92 lakhs per MWp per annum including insurance expenses and taxes.

- viii) Land Details: The petitioner has purchased land for the project measuring 218 acres.
- ix) Capacity Utilization Factor (CUF): Regulation 48 of the HERC RE Regulations, 2017, provides that the Commission shall decide the Capacity Utilization Factor (“CUF”) in case of project specific tariff determination. 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 Project has a total AC

capacity of 50 MW and have total module capacity of 50 MWp (DC Capacity). Based on the PVSYST simulations for the Project, the CUF is estimated to be 17.292% for first year of operation. The CUF is further adjusted for 1% of grid unavailability as per PPA leading to a CUF of 17.119% CUF which is used for tariff determination. The grid unavailability is assumed as 1% as Clause 12.3 of the executed PPA does not provide for any compensation if the grid unavailability is up to 1%. The relevant clause of the PPA, i.e., Clause 12.3 is reproduced below for ready reference:

“Clause 2.16 - "Capacity Utilization Factor" or "CUF" shall have the same meaning as provided in HERC (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2017 as amended or enacted from time to time CUF shall be calculated on the Contracted Capacity;

...

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):	<p>Generation Loss = [(Average Generation per hour during the Contract Year) × (number of hours of grid unavailability during the Contract Year minus 87.6 hrs)]</p> <p>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.</p>

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 petitioner has highlighted that Sineng Electric inverter 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 degree Celsius.

- x) Sharing of CDM Benefits: Regulation 20 (1) of the HERC RE Regulations, 2017, provides that 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 Proviso to the aforementioned Regulations provide that in case any PPA has a specific provision regarding sharing of CDM Benefits, the same shall be applicable in such case. Clause 21.2 of the PPA dated 20.11.2020 provides for the CDM benefits.
- xi) Subsidy or incentive by the Central / State Government: Regulation 21 of the HERC RE Regulations, 2017, provides that this 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 HER RE Tariff Regulations, 2017. The Project has availed exemption of stamp duty charges and registration of Sale Deeds which is provided as per Clause 4.11 of the Haryana Solar Policy, 2016. (Addendum 2nd dated 23.06.2017). The petitioner has calculated the tariff in accordance with the Regulation 7 (2) (d) of the HERC RE Regulations, 2017 assuming that the incentives from Central and State Government are not available.

In view of the parameters proposed by the generator, tariff calculation sheet has been appended by the petitioner in the present petition under consideration of the Commission. Accordingly, the levelized tariff estimated by the petitioner is Rs. 3.58/kWh.

- xii) Following prayers have been made:-
- a) Determine Tariff under Section 62 of the Electricity Act, 2003 for 50 MW Solar Power project of the petitioner, in terms of the contents aforementioned.
 - b) Direct the respondents to reimburse the fee towards filing of the present Petition (if paid by the petitioner) to the petitioner;
 - c) 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. Avaada Green HNProject Pvt Ltd. was made available on the website(s) of the Commission as well as that of the petitioner. A public notice was issued by M/s. Avaada

Green HNProject Pvt Ltd. in the newspapers, having wide circulation in Haryana, for inviting objections/suggestions from the stakeholders / General Public or any interested person, in accordance with the provisions of 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 was published by the petitioner, in the following Newspapers:-

Name	Language	Date of publication
The Pioneer	English	06.08.2021
Pioneer	Hindi	06.08.2021

The public notice issued by the Commission was published in the following newspapers, with last date of filing objections as 25.01.2021: -

Name	Language	Date of publication
Indian Express	English	28.07.2021
Dainik Jagran	Hindi	28.07.2021

4. In response to the public notice, no comments / objections were filed by any stakeholder, except respondent No. 1 (HPPC), on an affidavit dated 21.08.2021. The comments/objections filed by HPPC is briefly presented below:-

HPPC has submitted that:

- a) the Petition has been filed based on HERC RE Regulations, 2017. However, the said regulations have been substituted with RE Regulations, 2021 on 30.06.2021. The reference made to various provisions of RE Regulations, 2017 may be considered as per the corresponding provisions in RE Regulations, 2021 for the purpose of determination of various components of tariff.

HPPC has emphasized that the value of the parameters has to be aligned considering the market trend as per the Regulations of the Commission.

- b) It has been submitted that introducing competition in different segments of the electricity industry is one of the key features of the Electricity Act, 2003. The intent of encouraging competition is to yield significant benefits for consumers through reduction in Capital Cost and encouraging efficiency of operations. The Tariff Policy 2016 has reckoned that to keep the tariff low and the States have to endeavour to procure power from renewable energy sources through competitive bidding. However, in cases of project specific tariff determination as well, it becomes essential to consider efficiency of generator's business and to discourage inefficiencies being loaded on to the tariff.

- c) That the HERC RE Regulations, 2021 emphasizes the consideration of prevalent market trend for determination of project specific tariff for Solar Power Plants.
- d) That the HERC RE Regulations, 2021 categorically provides that the norms including Capital Cost, O&M expenses etc. and the tariff thereto for Solar PV / Thermal / Rooftop / Canal top / Water works, as per the technology approved by the MNRE, shall be determined on project specific basis depending on the prevalent market trend. The relevant part of the Regulations is reproduced hereunder:-

“Chapter – 8

Technology specific parameters for Solar PV Power Project

*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.***

Provided that the Discoms may do reverse bidding with the lowest / last discovered tariff lowest of competitive bidding by HPPC or SECI, as base tariff.

Provided that the norms including Capital Cost, O&M expenses etc. and the tariff thereto for Solar PV / Thermal / Rooftop / Canal top / Water works, as per the technology approved by the MNRE, shall be determined on project specific basis depending on the prevalent market trend only if required i.e. in case the competitive bidding route for any reason does not take effect. ...”(Emphasis Supplied)

- e) It has been submitted that the Hon’ble Central Electricity Regulatory Commission (CERC) in its recent Order dated 07.07.2020 in the matter of Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2020 applicable from 1.07.2020 – Statement of Objects & Reasons (SOR) observed that in view of the solar power market having attained maturity, the consideration of market trend is even more imperative. The relevant extract of the Order is reproduced hereunder:-

“6.11 Most of the Utilities are adopting competitive bidding route for procurement of power from solar and wind power projects. In some cases, it is observed that the tariff determination has been done by SERCs on case to case basis, which lead to the inclusion of solar power projects and wind power projects under project specific tariff. Further, the solar power and wind power have reached maturity level and hence, the market driven determination of tariff needs to be promoted.” (Emphasis Supplied)

- f) That this Commission also in its Order dated 20.12.2019 passed 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, held that the Capital Cost for the project has to be determined as per the market trend in following words –
“The Commission observes that the most important parameter impacting the levelized tariff is the project cost which as per HERC RE Regulations has to be aligned with the market trend.”
- g) That the Solar Photovoltaic (PV) market is on the verge of attaining maturity. Thus, the cost of installation of solar plant is now reducing at a very slow pace. Overall cost of installation has remained constant in the recent years. The solar tariff discovered in the competitive bidding process across in India has witnessed a downwards trend which touched a low of Rs. 1.99/kWh. Not only this, the solar tariff has been in the range of Rs. 2.00 per unit to Rs. 2.40 per unit in various other competitive bidding processes across the country, which clearly indicates that the overall expenses in setting up a solar generating plant has decreased resulting in decrease in solar tariff thereof.
- h) That the recent auction of 550 MW of solar projects at Rewa Agar Solar Park witnessed the bid as low as Rs. 2.44/kWh. It is further relevant to note that the quoted tariff of Rs. 2.44/kWh here includes 40% high Custom Duty which is applicable for future imports. Furthermore, in another auction, NTPC became the L-1 for 105 MW and 220 MW Solar projects at the lowest tariff of Rs. 2.35/kWh and Rs. 2.33/kWh for Shahjapur Solar Park in Madhya Pradesh. In another most recent auction held in the month of August, 2021 for 500 MW of projects at the Neemuch Solar Park in Madhya Pradesh, a levelised tariff of Rs. 2.14/kWh has been discovered which is inclusive of Basic Custom Duty (BCD) of 40% applicable for future imports of solar modules and MAT/corporate taxes. These tariffs indicate the market trends and the variation in the cost of PV modules including Balance of Supplies (BoS).
- i) That the low solar tariff of Rs. 1.99 per unit quoted in the auction held by SECI is inclusive of all taxes and duties. However, on the tariff determined by this Commission, the respondent separately pays corporate tax which is a pass through expense. Seen from that perspective, the tariff of Rs. 1.99 per unit minus corporate tax which is paid on actual basis in terms of HERC RE Regulations works out to Rs. 1.86 per unit only.
- j) There are two major reasons for the falling tariffs: module price and interest cost reduction. It is therefore, the incumbent duty of the generator to ensure that the procurement management and debt management is done effectively. Merely because the tariff is not being determined through competitive route, the same cannot be allowed to work against the interest of the consumers.

- k) That various solar power generators, having been conscious of the recent tariff determined by the Commission in the case of 50 MW solar power plant of M/s Amplus Sun Solutions Pvt. Ltd., are constantly making offers to the respondent for sale of solar power at tariff to be determined by this Commission under Section 62 of Electricity Act, 2003. Meaning thereby that the tariff recently determined by the Commission in the case of M/s Amplus Sun Solutions Pvt. Ltd. at Rs. 2.48/unit, is feasible and attractive for Solar Power generators.
- l) In view of the regulatory framework set up for the RE Projects, it is imperative that the Commission considers market trend for arriving at the value of various parameters of the Plant to balance the interest of the stakeholders.

Status of the project:-

- m) HPPC has averred that the petitioner has submitted that the project is at the final stage of completion; whereas the work of control room, inverter station and switch yard foundation have been completed, the work of roads, bay end and transmission infrastructure is still in progress. It is pertinent to mention that at the time of adjudication of approval of source of present project, in the Order dated 03.11.2020, it was represented that pursuant to grant of final connectivity for sale of power under Open Access on 18.10.2019, the petitioner had started construction of the project and the same is near completion. However, from a perusal of the present Petition, it is evident that various works are pending. The petitioner has not explained the delay caused in completion of the Project.

Capital cost of the plant :-

- n) It has been submitted by the intervener that the petitioner has claimed total project cost of Rs. 189,04,42,909/- for 50 MW power Plant. Out of said cost, it has been stated that Rs.182,22,07,287 has been 'committed'. Further, Rs.6,82,35,622/- has not been spent till date and is an estimate to be incurred for the purposes of commissioning of the plant. It is, however, pertinent to note that majority of the 'committed' cost, i.e. nearly 54% is for Solar Module. The total cost of Solar Module has been stated as Rs. 98,32,36,250/-. To substantiate the said cost, petitioner had referred to Purchase Orders. However, no invoices in support of the same have been placed on record. It has not been explained as to what constitutes 'committed' cost or whether the alleged committed cost has been fully utilized on the Plant.
- o) From the foregoing, it is evident that the alleged Cost of Module, Plant and Machinery, Power conditioning unit and evacuation infrastructure, which is nearly Rs.131.71 crore is exorbitant and irrational in view of the market trend of the prices of Solar Power Plant. Also, the petitioner has claimed total cost of Rs. 26.36 crore on account of Civil Works, whereas in the case of similarly placed generator, i.e. M/s Ampulus Sun

Solutions Pvt. Ltd., the cost claimed under this head was limited to Rs. 22.76 crore. The alleged estimates are arbitrary and unsubstantiated.

- p) HPPC has submitted that It is pertinent to refer here the order of the Hon'ble Commission in PRO-59 of 2020 dated 18.01.2021, i.e. tariff determination petition filed by M/s Amplus Sun Solutions Pvt. Ltd. The Hon'ble Commission in the said Order had allowed the module & related cost amounting as Rs. 88 crore and cost of civil works as Rs. 13.60 crore for 50 MW Plant with committed CUF of 25.91. It is also pertinent to highlight that the Commission in PRO-59 of 2020 had aptly observed that to claim Capital Cost, the generator has to establish that the same is ideal/minimum cost which was essentially required to be incurred backed by quotes from more than three vendors etc., in absence of which it cannot be held that Capital Cost incurred takes into account all economic safeguards and negotiations.
- q) HPPC has further pointed out that the petitioner has claimed a cost of Rs. 1.89 crores towards 'Corporate Engineering and Procurement'. Further, nearly Rs. 3.67 crores has been claimed under various heads such as Site Expenses, Studies and Investigation, statutory fees, establishment and security services etc. In this regard, it is submitted that the Commission in order dated 18.01.2021 passed in PRO-59 of 2020 had categorically observed that for claiming such line expenses, it is incumbent upon the generator to establish that it had exercised due diligence including leveraging its expertise and vast experience in avoiding such expenses.
- r) It has been submitted that the available literature including reports from international organization like IRENA, indicate rapid decline in cost of the module beginning from the year 2015. They also reveal that the reductions in cost of the module is not only influenced by substantial capacity and deployment upsurge, but more recently because of improvements in production process, more competitive supply chain, technological improvements and efficiency gains associated with increased adoption of newer cell designs. In the energy markets around the world, rising competitive pressures with continued innovation drive, in bringing down the cost of the PV modules. While equipment costs keep declining, the reduction in balance of-system, O&M and Capital Cost are important parameters for overall cost considerations. Admittedly, the prices of modules with high efficiency have shown significant reduction over the years with constantly decreasing trend. Similarly reports suggest that with advancement in technologies there is a decrease in price of other equipment's associated with the solar photo voltaic plant. Achieving optimal performance depends on selection of technology and factoring in various parameters that influence the performance of the Power Plant. The Commission must take note of these developments while considering the Capital Cost of the Plant of the petitioner.
- s) HPPC has submitted that the Hon'ble Commission in Order dated 20.12.2019 passed in PRO-57 of 2019 for the petition for determination of levelized tariff for purchase of

power from decentralized Solar Power Plants set up under PM KUSUM Scheme introduced by Government of India (GoI) observed that the Capital Cost of such projects especially the cost of modules, inverter and civil work may not vary significantly across the Country. Considering the then recent orders of Karnataka Electricity Regulatory Commission and the Rajasthan Electricity Regulatory Commission, the Commission pegged the Capital cost for the Solar Projects under PM KUSUM Scheme 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 small-scale plants having capacity up to 2.0 MW only. The said tariff ought to be further reduced for large scale megawatt projects. Thus, the Capital Cost claimed by the petitioner is in no manner aligned to market trend and not worthy of consideration.

- t) It has been submitted by HPPC that the Uttarakhand Electricity Regulatory Commission in Order dated 07.06.2019 passed in Petition No. 18 of 2019 for review of the Benchmark Capital Cost for Solar PV, Solar Thermal and Grid Interactive Rooftop & Small Solar PV Plants to be applicable for FY 2019-20 had approved total Capital Cost of Solar PV plants after neutralizing the de-gradation factor as 3.56 crore/ MW. The break-up of the said cost is summarized as under –

SN	Particulars	Approved Cost per MW for FY 2019-20 (in Rs. crores)
1.	Cost of PV module	2.2485
2.	Land Cost	0.50
3.	Civil and General Works	0.142
4.	Mounting Structure	0.150
5.	Power Conditioning Units	0.150
6.	Evacuation infrastructure	0.188
7.	Preliminary and Pre-operative Expenses (5.21% of total capital cost)	0.186
TOTAL		3.5645

- u) It has been argued by HPPC that the costs approved by Uttarakhand Electricity Regulatory Commission in the above referred Order are based on generous consideration of the market prices. It is however, not specified in the order of the UKERC that as to what includes the module cost mentioned as Rs. 224.85 Lakh/MW. However, a holistic view of all cost components reveals that the said cost includes supply as well as installation and commissioning cost of modules, which in the present case is exceeding the approved cost provided in the order of UKERC. The cost of civil works is worked out based on the average increase of Whole Price Index (WPI) and Consumer Price Index (CPI) for immediately preceding three years by giving equal weightage. Preliminary and Pre-operative expenses is taken on fixed percentage basis, which is 5.21% of total Capital cost. Based on the same, Hon'ble Commission arrived at the total Capital Cost of Rs. 3.5645crore/MW including the cost of land. The

generic tariff, in case of solar PV based generation plants, is generally determined up to 5 MW plants, as such, considering the economies of scale and reduced cost of solar inverter and panel during FY 2019-20, the capital cost per MWh as to be in the range of Rs. 2.5 crores with CUF of 20%, as considered by this Commission while determining tariff for Component A of PM KUSUM scheme. Compared to the same, the cost claimed by the petitioner is exorbitant and exaggerated.

- v) That the tariff determined by UKERC in its Order dated 07.06.2019 is for very small projects and is influenced by factors such as higher O&M, interest rates etc. As such generic tariff of UPERC cannot be taken as a benchmark for determination of tariff in the instant case however, the capital cost per MW may be considered as benchmark for small projects.
- w) It has been submitted by HPPC that the Hon'ble Rajasthan Electricity Regulatory Commission (RERC) in their order dated 11.02.2020 in the matter of determination of pre-fixed levelized tariff for sale of power from power projects set up under Component-A and rate for purchase of excess power from solarised agriculture pumps under Component-C of the PM KUSUM Scheme of GoI to the State Discoms had considered the cost of setting up 1 MW solar plant along with 3 km 11 kV connected line as Rs. 3.65 Crore per MW. The cost of project without the cost of 11 kV line/breaker works out to be Rs. 3.50 Crore per MW.
- x) The Ministry of New and Renewable Energy (MNRE), vide Office Memorandum dated 21.07.2020, has also notified benchmark cost for Grid connected Rooftop Solar Photo Voltaic systems ranging from 100 kW to 500 kW for the FY 2020-21 as Rs. 36 per Watt. Pursuant to the said notification of MNRE, a notification dated 07.12.2020 was issued by GUVNL wherein benchmark cost of the Plant having capacity between 100 kW to 500 kW has been specified as Rs. 3.04 crore per MW. It has been learnt that the cost has been discovered through bidding process and is inclusive of O&M cost for 5 years. Needless to mention that these are retail prices which are considerably higher in general. Considering the economies of scale, the capital cost of 50 MW solar plant should be much lower.
- y) The Hon'ble Karnataka Electricity Regulatory Commission (KERC) had adopted Capital Cost of Rs. 3.50 crores per MW in their Order dated 18.05.2018 where average module cost was at about Rs. 19.68/Watt. However, the Hon'ble KERC in Petition for determination of tariff in respect of Solar Power Projects for FY 2020 by order dated 1.08.2019 approved the Capital Cost of Rs. 3.14 crore/ MW excluding the cost of Land. 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 shows a reduction in module cost by about 24% as compared to the cost of previous year. It was held that with the reduction in costs of other equipment and materials along with reduced interest rates, the Capital Cost of Rs. 3.14 crores/MW, for ground mounted solar PV

based projects having capacity of less than 5 MW, is fair and reasonable for such megawatt scale ground mounted solar power plants.

- z) That the Hon'ble KERC vide its Order dated 22.05.2020 for extension of tariff for Solar Projects for FY 2021 had observed as under –

“As on date module cost has come down drastically and thereby, the project cost will come down correspondingly.....”

It is therefore, evident from the order of the various Hon'ble State Electricity Regulatory Commissions across the country that the Capital cost claimed by the petitioner is far away from the market prices. Thus, the Commission may consider reasonable Capital Cost with committed CUF in line with its Order dated 20.12.2019 in PRO-57 of 2019.

- aa) In the Order of the Commission dated 20.12.2019 passed for PM KUSUM Scheme related to capacity of less than 2 MW, the Capital Cost has considered as Rs. 3.40 crores/MW which is inclusive of cost of land and transmission infrastructure. Considering the downward trend of the prices and applying economies of scale for the capacity of the Plant of the petitioner, the said Capital Cost should be reduced by about 15%. The respondent had provided for the reverse calculation and based on the same, the amount ought to have been considered at Rs. 2.25 crores per MW with CUF of 17.292 % albeit inclusive of cost associated with degradation factor. It is apparent that the capital cost claimed by the petitioner is in not aligned to market trend and is exorbitant.
- bb) The capital cost of solar project is related to CUF as higher CUF can be achieved by adding solar panels. The petitioner has claimed DC CUF of 17.292%. Considering the lower CUF of 17.292%, the claimed Capital Cost for the Project of petitioner should be in range of Rs. 2.25 to Rs. 2.62 crores per MW only. Further, in PRO-59 of 2020, the Commission after observing that the allowed Capital Cost of Rs. 38.25 Million/MW for 50 MW Plant is comparatively higher, considered it reasonable only considering the for CUF of 25.91% (AC).
- cc) The capital cost determined by this Commission under KUSUM Scheme and the benchmark cost approved by the Uttarakhand Electricity Regulatory Commission included in addition to cost of land, evacuation system, “monetized value attributed to degradation of solar panels”. Without such degradation, the Capital Cost would have been much lower. The Net present value cost associated with degradation of solar panel has been specifically worked out as Rs. 8.84 lakhs/MW by the Uttarakhand Electricity Regulatory Commission in its Order dated 07.06.2019. If the cost of degradation is not included in the Capital Cost of the petitioner, the benchmark Capital Cost should be lower. Thus, Capital Cost for the Project of the petitioner would have to be reduced to exclude the degradation cost. Capital Cost determined by Hon'ble Commission for projects under PM KUSUM is inclusive of degradation of 0.5% in the CUF. The Hon'ble Commission had not provided for a separate degradation in the CUF

in that case. The Commission may therefore, consider the said fact and the Capital Cost of the petitioner may be revised accordingly.

- dd) HPPC has further submitted that the solar power plant of the petitioner has been set up on purchased land and therefore, cost of the land is included in the capital cost. The petitioner has submitted that an amount of Rs. 20,52,48,334 has been incurred for purchase of 218 acres of land. It has been not provided as to how much land has been utilized for the construction of plant. The cost of the land shall only be considered to the extent the same has been utilized for the plant. Further, the collector rate for the area of the project must be taken into consideration. Further, land is a non-depreciating asset and as such instead of considering the cost of land for tariff determination, the Commission may consider the lower of lease rentals in the area or interest on investment on land. The petitioner be asked to submit the requisite documents in this regard.

Operation and Maintenance expenses of the plant:-

- ee) HPPC has submitted that the petitioner has claimed O&M expense @ Rs. 3.92 lakhs per MW. In this regard, petitioner has provided estimated cost of expenditure under various heads and has relied upon the Orders of various SERCs. At the outset, it is submitted that the petitioner has claimed O&M Cost without furnishing substantial reason and documents for consideration of the Commission. It is submitted that the petitioner has not appended any cogent document evincing market trend for O&M cost for Solar Plants of equivalent capacity. It is pertinent to note that Solar Power Plants are characterized by their simple and low-cost operation and maintenance (O&M). The operation and maintenance mainly involve cleaning of the photovoltaic modules at regular interval. The cleaning frequency of the modules of a commercial plant may be as high as once per week or as low as once per month. In addition to cleaning staff, power plants typically require security staff and site supervisors. Performance monitoring of such plants are typically done remotely, and an engineer is deployed onsite only during troubleshooting of issues or preventive maintenance. The Commission may therefore, consider O&M Cost for the Plant of the petitioner prudently keeping in consideration the realistic expenditure involved.
- ff) Further, as per Regulation 49 (1) of HERC RE Regulations, 2021, 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 Kadiri, Ananthapur, 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. The said offer is descriptive and indicates breakup for every component of the cost. The claim of the petitioner for O& M is therefore, way

exorbitant and not worthy of any consideration. 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.

- gg) That in the recent tender floated by HPGCL, the L-1 bidder has quoted O&M expenses of Rs. 3.21 Lac/MW for 10 MW & 6 MW solar power plants envisaged to be setup at village Dhandlan (Jhajjar) and village Chandpur (Faridabad), respectively.
- hh) While adjudicating PRO-59 of 2020, this Commission had observed that O&M contracts are fairly broad based and as such mere quotations cited by generator cannot be taken at its face value for the purpose of tariff determination. The Commission further observed that the offer dated 15.10.2020 made by BHEL for 50 MWp Solar Power Plant of NTPC, ought to be the benchmark depicting the prevalent market trend. Considering that, the Hon'ble Commission fairly and justly approved O&M expenses of Rs. 0.303 Million / MW inclusive of Insurance and all taxes and levies for 50 MW project for first year. It is relevant here to note that M/s Amplus Sun Solutions Pvt. Ltd has commissioned 75 MW DC capacity whereas the petitioner has proposed to commission 50 MW DC capacity for contracted capacity of 50 MW. The cost of O&M for the plant of petitioner needs to be reduced accordingly. The O&M expenses for the Plant of the petitioner shall also be approved at par by grossing up the O&M with the proposed DC capacity of plant.
- ii) That Regulations 49 (2) of the HERC RE Regulations, 2021 provides for escalation of 2.93% per annum on O&M cost. Thus, the Commission may provide escalation on O&M as per prevailing RE Regulations.

Capacity Utilization Factor (CUF) of the plant:-

- jj) On the issue of CUF, HPPC has contended that the petitioner has claimed CUF of 17.292% (DC). There is no basis for such an assumption made by the petitioner. The claim is based on hypothetical assumptions, which also have not been detailed in the Petition. It is pertinent to mention that the petitioner in its DPR submitted with HVPNL and HAREDA for the Project has envisaged a CUF of 25.2%. petitioner is in contravention to its own submissions on CUF and now revised the same as per his convenience to secure higher tariff.
- kk) The Commission for the similar project installed in nearby area of District Bhiwani has allowed CUF @ 25.91% AC with annual degradation of 0.50% in Order dated 18.01.2021 passed in PRO-59 of 2020. Further, the Commission in its Order dated 20.12.2019 has considered CUF as 20%. Most of the SERCs across the Country have adopted a CUF in range of 19% -21% for Solar PV.
- ll) As per RE Regulations, 2021, CUF has been stipulated as 21% which is a ceiling parameter. The claimed CUF is a mis-projection which is far-fetched from the market trend and in violation of the RE Regulations, 2021.

- mm) HPPC has argued that the contention of the petitioner regarding grid downtime i.e. loss of generation beyond 1% is untenable and may not be considered as such. The said margin of 1% has been taken from the PM KUSUM scheme which does not provide any generation compensation upto this level. The Commission in its order dated 20.12.2019 while determining tariff for ground mounted solar PV projects to be set up in Haryana under PM KUSUM scheme has also 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 finds 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.

Capital Structure (Debt- Equity ratio):-

- nn) The petitioner has claimed Debt-Equity Ratio of 70:30 as per the RE Regulations. However, the Commission may call for necessary details/ documents establishing actual equity infused by the petitioner in the instant Project. The said documents are essential to ensure that 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.

Loan and Finance charges; Return on Equity; Depreciation and Working Capital:-

- oo) The normative figures provided in the Regulations are the ceiling parameters. Therefore, reasonable figures with ceiling of normative parameter may be considered by the Commission for determination of tariff of the Plant.

Sharing of CDM benefits and subsidy/ incentive by Government: -

- pp) As regards sharing of CDM Benefits, it is submitted, that whenever, the same would be applicable to the Plant of the petitioner, the petitioner shall be directed to pass on the same to the respondent as per RE Regulations. Similarly, subsidy/incentive if availed by the petitioner in the future, the same shall be disclosed to the respondent and the benefit of the same shall be passed on to the respondent.

The solar tariff have been witnessing a declining trend constantly:-

- qq) Asia Development Bank Institute (ADB) recently in February 2020 has issued a working paper titled as 'Analyzing the falling Solar and Wind Tariffs: Evidence from India'. The introduction to the paper mentioned about the declining trend of solar tariffs as under:-

“The last few years have seen a significant decline in solar and wind energy tariffs in India, making the business case for these RE sources considerably more robust. The year 2017 witnessed record-low winning tariffs of INR 2.44 per kWh (USD 0.04) and INR 2.43 per kWh (USD 0.04) for utility-scale solar and wind energy generation tariffs, respectively (Press Information Bureau 2017, Government of India; Press Information Bureau, Government of India 2018b). While a number of factors together have resulted in the decline in tariffs, the contributions of declining equipment costs and the introduction of competitive auctions have been noted as being significant (IRENA 2016; Crisil 2017; Shrimali et al. 2015). However, besides equipment costs, tariffs are a composite of a number of constituents including financing costs, operations and maintenance expenses, and the impact of government incentives...”

rr) The ADBI paper provided the breakdown of the Solar tariff for May 2017 as under:-

Table 4: Component-Wise Breakdown of February 2017 Wind Tariff and May 2017 Solar Tariff (All Costs are in INR/kWh)	May 2017 Solar Tariff
Operations and Maintenance	0.44
Wind Turbine/PV Module	0.47
Land Lease/Solar Park Charges	0.32
Balance of System	0.22
Financing Costs	1.38
Accelerated Depreciation Benefit	-0.21
Total	2.62
Tariff (actual)	2.44
Model Error	0.18

- ss) The aforesaid paper of ADBI is based on wide accumulation of actual facts and figures from across the country. The value of parameters such as Capital Cost, O&M expenses etcetera claimed by the petitioner are exorbitant and farfetched from the market trend.
- tt) That Aravali Power Company Private Limited recently vide their letter dated 18.12.2020 had quoted 25 years levelized tariff for Floating Solar Power Plant in the range of Rs. 2.60 to Rs. 2.80 (which is subjected to competitive bidding) envisaged at Raw Water Reservoir of Thermal Power Generation Plant at District Jhajjar. It is pertinent to note that Floating Solar Plants, being capital intensive plants have relatively higher tariff than Solar PV Plants.
- uu) That in the auctions of 2.0 GW ISTS tender held by SECI for Solar Power in July 2020, the tariffs had dropped to a low of Rs. 2.36 per unit. Further, in an auction conducted in November 2020 for sale of power to State of Gujarat, lowest tariff of Rs. 1.99 per Unit was quoted. The decline in solar panel prices has significantly contributed to declining tariffs.
- vv) The trend of low tariffs discovered in the range of Rs. 2.14/kWh-Rs. 2.44/kWh discussed above shall be considered in ascertainment of tariff for the Plant of the petitioner. It is reiterated that recent auction of 550 MW of solar projects at Rewa Agar

Solar Park witnessed the bid as low as Rs. 2.44/kWh, which includes 40% high Custom Duty. Also, NTPC became the L-1 for 105 MW and 220 MW Solar projects at the lowest tariff of Rs. 2.35/kWh and Rs. 2.33/kWh for Shahjapur Solar Park in Madhya Pradesh and in recent auction held in the month of August, 2021 for 500 MW of projects at the Neemuch Solar Park in Madhya Pradesh, a levelized tariff of Rs. 2.14/kWh has been discovered which is inclusive of basic Custom Duty of 40% and MAT/corporate taxes.

5. The Commission in its Interim Order dated 25.08.2021, observed that the present petition filed on 29.06.2021, is under the provisions of the HERC RE Regulations, 2017. In fact, reckoning from the SCOD/COD, the same was required to be filed under the provisions of HERC RE Regulations, 2021, which was notified on 30.04.2021. Accordingly, the Commission directed the petitioner to file its reply to the comments filed by HPPC including re-calculation of the proposed tariff as per the provisions of HERC RE Regulations, 2021. **In response, the petitioner filed its reply on 08.09.2021 (affidavit dated 07.09.2021), submitting as under:-**

Reply / Rejoinder filed by the petitioner:-

- a) That the tariff ought to be determined as per Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2017 ('RE Regulations, 2017'). The present Project was envisaged by the petitioner pursuant to the Haryana Solar Policy, 2016, and the RE Regulations 2017 were envisaged under the Haryana Solar Policy, 2016. It is further submitted that the Project was registered with Haryana Renewable Energy Development Agency on 15.07.2019 under the Haryana State Solar Policy, 2016. The petitioner was granted final connectivity for sale of power under Open Access on 18.10.2019. The Draft PPA was approved by this Commission on 03.11.2020. Further, the Power Purchase Agreement was signed by the parties on 20.11.2020. Thus, the Project of the petitioner having been envisaged under the RE Regulations, 2017 and all fundamental steps towards the execution of the Project having been taken in the year 2019-2020, the tariff ought to be determined as per the RE Regulations, 2017.
- b) The respondent has averred that the Tariff Policy has reckoned to keep the tariff low. The objective of lower tariff cannot be and should not be understood in isolation and must not stand in way of the greater objective of promoting generation of energy through renewable sources. Even otherwise, the objective has to be to harmonize both the consumer as well as generator's interest and it is in view of the above, it is to be seen that the petitioner has procured the requisite equipment in a cost efficient and transparent manner.

- c) That the petitioner has experience of developing capacity of more than 2.5 GW of power plants across India and has its presence in the solar power plant business since the year 2009. The petitioner has highly skilled & efficient resources and is presently engaged in developing a pipeline of 4000 MW across the country. The aforementioned experience and expertise of the petitioner goes on to show that it is well-versed with the market practices and is efficient in dealing with the prices so quoted by the relevant suppliers. In this regard, it is submitted that the petitioner had made all efforts/endeavors to obtain the best possible prices for the equipment's so required and has adopted a fair, transparent mechanism of competitive bidding as also negotiation, to procure the best possible price for the equipment. The quotation/ auction report for all the major equipment viz. inverter, transformer [inverter transformer/ power transformer], module mounting structure, transmission line and other works to illustrate the mechanism followed by the petitioner for procuring the best price of the equipment, are attached.

Ref: Recent market trends

- d) That tariff under Section 62 of the Electricity Act, 2003 has to be determined specifically for the Project, and differences in tariff may arise on account of various factors including but not limited to '*consumer's load factor, power factor, voltage, total consumption of electricity during any specified period or the time at which the supply is required or the geographical position of any area, the nature of supply and the purpose for which the supply is required*'. Further, in addition to the aforementioned factors, various other factors including the State Policies, Government aid availability, Solar irradiations, infrastructural facilities, O&M costs, land availability & cost, procedures followed by the authorities, safeguards provided by the State etc. are also the relevant factors while determining the Tariff of specific power plants. In view of the aforementioned, Tariff for different projects has to be determined taking a holistic view and considering all the factors and not in isolation. Thus, the term market trend has to be understood in the light of the aforementioned factors applicable to each of the power plants and cannot be considered in isolation to the aforementioned factors.
- e) The projects referred to by the respondent are basically Section 63 (competitive bidding projects) which cannot be compared to the present Project, being under Section of 62 and regulated by tariff determination regulations which consist of set parameters for the tariff determination. Furthermore, the present project and other projects referred to by the respondent cannot be compared on account of difference in the policy framework, capital cost, O&M, land cost and radiation/ CUF, economies of scale, timelines for commissioning of projects, dynamics specific to each tender and its terms and conditions and the projects being under the Solar Park tenders (wherein land and all related infrastructure for solar projects are to be provided by the tendering agency). Moreover, the cost of setting up of Solar Project in Rajasthan, Gujarat,

Madhya Pradesh, Maharashtra, Karnataka which are rich in RE resources cannot be compared with other RE States like Haryana where cost of land is one of the highest in India. Also, subsequent to the SECI bid (wherein the lowest tariff was arrived in the range of Rs. 1.99/unit to 2.40/unit), higher tariffs have been discovered in the States like Uttar Pradesh, Kerala, Bihar, Maharashtra etc. The details of such tariffs are as under:-

Tender Particulars	Capacity Breakup	e-Reverse Auction Date	Tariff Discovered (Lowest Bidders)
Bihar 250 MW Solar Projects Tender	250 MW	23 rd – August – 2021	Rs. 3.11/kWh – Rs. 3.20/kWh
Kerala 200 MW Solar Projects Tender	200 MW	12 th – Nov – 2020	200 MW – Rs. 2.97/kWh
MSEDCL 500 MW STU Connected Solar Projects Tender [Tranche-V]	500 MW	18 th – Mar – 2020	Rs. 2.90/kWh
Uttar Pradesh 500 MW Solar Projects Tender [Tranche-II]	500 MW	10 th – Oct – 2018	Rs. 3.17/kWh – Rs. 3.23/kWh
Uttar Pradesh 550 MW Solar Projects Tender [Tranche-III]	550 MW	12 th – Dec – 2018	Rs. 3.02/kWh – Rs. 3.08 /kWh

Ref: Impact of the outbreak of COVID-19 on the equipment's materials to be used at the power plant of the petitioner

- f) That after the outbreak of the Pandemic, the prices/ availability of steel, cement, labour and other civil materials etc. have gone up due to the supply related issues. The rise in prices of the aforementioned material as per London Metal Exchange (LME) and present market trend is indicated below:-

PRICE IMPACT ON COMMODITIES DUE TO COVID-19/OTHER RELATED CHALLENGES			
S.NO.	DESCRIPTION	ESCALATION OF PRICE W.r.t OCT/NOV'2020 (%)	REMARKS
1	Solar Module	56%	
2	Module Mounting Structure	69%	Steel Price and Labour Availability/wages
3	Inverter Duty Transformer	41%	Steel/Aluminium Price are being traded at its peak level. At LME, Al has been increased from 1700 USD/Tonne (Oct'2020) to 2400 USD/Tonne (June'2021). At LME, Cu has been increased from 6500 USD/Tonne (Oct'2020) to 9200 USD/Tonne (June'2021).
4	Power Transformer	54%	At LME, Al has been increased from 1700 USD/Tonne (Oct'2020) to 2400 USD/Tonne (June'2021). At LME, Cu has been increased from 6500 USD/Tonne (Oct'2020) to 9200 USD/Tonne (June'2021).
5	DC Cables	44%	At LME, Al has been increased from 1700 USD/Tonne (Oct'2020) to 2400 USD/Tonne (June'2021). At LME, Cu has been increased from 6500 USD/Tonne (Oct'2020) to 9200 USD/Tonne (June'2021).
6	HT Cables	41%	At LME, Al has been increased from 1700 USD/Tonne (Oct'2020) to 2400 USD/Tonne (June'2021).

7	Civil Works	30%	Steel Price/Cement/Sand/Metal Prices are skyrocketing. Labour Availability/wages
8	Transmission Line	69%	Steel/labour/Aluminium Prices are skyrocketing
9	Logistic Cost	30%	Container freight charges

Ref: Reference to Regulations/ Orders pertaining to Competitive Bidding

- g) That the submissions of the respondent are contrary to the very letter and spirit of the PPA entered into between the parties, wherein the respondent herein expressed its desire to purchase the entire solar electric energy generated in the Solar Power Plant of the petitioner in the terms of the PPA therein. Thus, having opted for the PPA under Section 62 of the Electricity Act, 2003 and the same being approved by this Commission and is regulated by tariff determination regulations which consist of set parameters for the tariff determination. Hence, the objections/ averments pertaining to competitive bidding are totally extraneous and irrelevant, apart from being self-contradictory.

Ref: Status of the Project

- h) That the respondent visited the site of the petitioner on 23.08.2021 and all works on the site have already been completed, apart from the installation of solar modules, which too shall be done within a period of 45 days. The petitioner has issued a letter dated 04.09.2021 to the respondent providing the timelines for synchronization and commissioning of the project.
- i) That due to the COVID-19 pandemic which hit the country in March, 2020 and second wave which started in Feb-March 2021, there has been disruptions in various activities including construction, logistics and thus completion and operationalization of the petitioner's power plant. In view of the above, there has been no delay in completion of the project that is attributable to the petitioner herein, as averred or otherwise.

Ref: Capital cost of the Plant

- j) Solar PV Modules- The petitioner has attached invoices for the Solar PV Modules procured by it as also other relevant documents (Module Supplier Agreement, the tax invoice, letter of credit, shipping documents and the production & inspection reports) in support thereof. The earlier vendor M/s Risen had shown inability to supply the modules for the Project. In spite of the issue faced by the petitioner due to COVID-19 pandemic as well as prevailing Global supply chain disruptions and container /freight crisis, the petitioner, with its efforts, has been able to engage a new vendor for supply of solar modules and has been able to negotiate, a lesser price as compared to the earlier submitted PO (M/s Risen).
- k) Civil Works- The petitioner has justified the costs of the civil works sought to be incurred by it by way of the documents filed along with the Petition. In this regard, it is submitted that the respondent has not disputed the said costs given by the petitioner,

as also the basis thereof. Further, the petitioner has negotiated the best price possible for the civil works to be executed.

- l) Cost towards corporate engineering & procurement and other charges towards site expenses, studies and investigation, statutory fees, establishment and security services etc.- That the petitioner has filed the CA Certificate dated 06.09.2021, which established the aforementioned costs incurred by the petitioner. The respondent has not disputed as to the aforementioned costs incurred by the petitioner as also the due diligence employed by the petitioner.
- m) Land- The entire land of 218 acres has been utilised towards the construction and for operationalization of the plant. Further, in PRO-59 of 2020 (M/s Amplus Sun Solutions Pvt. Ltd. v. Haryana Power Purchase Centre & Anr.), this Commission had allowed 260.1 acres of land for construction of 50 MW Solar Plant. It is further submitted that the averment of the respondent as regards the collector rate/ DLC rate of the land being taken into account is irrelevant as the petitioner has provided the actual figures as regards the procurement of land. Without prejudice to the aforementioned it is submitted that even otherwise, the cost of land procured by the petitioner, is in fact less than the collector rate/ DLC.

Ref: Operation & Maintenance of the Plant

- n) That the O&M of a plant does not include mere cleaning of the solar modules as suggested by the respondent and has a wide scope including expenditure on manpower, repairs, maintenance of spares, consumables, insurance, overheads and fuel cost other than used for generation of electricity. Thus, the scope of O&M is wide and needs to be considered/ appreciated in a holistic manner. Even otherwise, the respondent has failed to give any specifics to show as to how and why, the O&M cost claimed by the petitioner should not be allowed by this Commission.
- o) The respondent has relied on the offer dated 15.10.2020 submitted by BHEL for O&M works of NTPC 50 MW Solar Power at Kadiri, Andhra Pradesh for a period of 11 months. In this regard, it is submitted that the aforementioned amount/ offer quoted for O&M works of NTPC by BHEL cannot be compared by the O&M costs to be incurred by the petitioner herein. Copy of the revised O & M Cost break up has been annexed along with the copy of the detailed scope of works for the petitioner power plant and O&M Works for the NTPC Plant.
- p) That the reference placed by the respondent on the purported tender floated by HPGCL, wherein the L1 has quoted O&M expenses of Rs. 3.12 lacs/MW for 10 MW and 6 MW Solar power plant is vague and unspecific, in as much as, the respondent has failed to highlight as to how can aforementioned rates be applicable to the petitioner's power plant, more so when the petitioner has supplied all the relevant information and details towards the associated O&M costs.

- q) The respondent has further referred to the order dated 18.01.2021 in PRO 59 of 2020 passed by this Commission wherein the Hon'ble Commission has approved O&M expenses of Rs. 0.303 million/MW inclusive of insurance and all taxes. In this regard, it is submitted that as already brought out above, tariff determination is specific to each of the power plant and a blanket approach cannot be adopted while determining the tariff. The petitioner has duly justified the amount claimed by it as O&M costs and has also substantiated the same by the relevant documents and thus, the petitioner ought to be awarded the same. Without prejudice to the above, even otherwise, in PRO 59 of 2020, the generator therein did not give the specific details pertaining to the scope of work in the O&M expenses and merely gave quotations for O&M Works by third parties. However, in the present case the petitioner has submitted a detailed scope of O&M works along with the cost break up and on that account too, the petitioner ought to be awarded the amount claimed by it.
- r) As regards the averments of the respondent that since M/s Amplus Sun Solutions has commissioned 75 MW DC capacity and the petitioner's plant is 50 MW DC capacity and therefore, the petitioner's cost should be reduced accordingly, it is submitted that the said assertion of the respondent is baseless and misconceived. The petitioner has failed to give any reason whatsoever, for the reduction of the O&M costs for the petitioner's power plant on the purported basis of difference in the DC capacity. It is submitted that this Commission had disallowed the additional DC capacity of 25 MW, and thus, the aforesaid contention pertaining to proportionate reduction of O&M cost of the petitioner's plant is even otherwise, erroneous and misconceived. Even otherwise, the petitioner has duly justified the O&M costs so claimed by it.
- Ref: Capacity Utilization Factor (CUF) of the Plant**
- s) As regard the CUF, 25.2% CUF as mentioned in the DPR was envisaged at the time of setting up of open access project wherein an overloading of 40% was considered. Whereas, in the present petition, the petitioner is claiming 17.292% on the basis of the installed capacity of 50 MW only (i.e. 1:1 ratio). Also, keeping in view the order passed by this Commission in PRO-59, wherein the cost associated with the additional DC capacity was not considered/ disallowed. Accordingly, the petitioner decided to install the plant with 1:1 AC/DC ratio and accordingly CUF has been calculated and validated by the third-party consultant namely Arbitus.
- t) Without prejudice the foregoing, in case a minimum 21% CUF is to be achieved in terms of RE Regulations 2021 and the petitioner would be required to install additional DC capacity to achieve the required minimum CUF. Accordingly, if the Commission is of the view that minimum 21% CUF is to be achieved, in that event the petitioner may be granted additional capital cost for the additional DC capacity.
- u) As regards, grid downtime loss of generation, the same needs to be governed by the PPA approved by this Commission and signed by the Parties.

Ref: Capital Structure (Debt-Equity Ratio)

- v) With regards to the Capital Structure, it is submitted that the Capital Structure of petitioner is in terms of Regulation 12(2) of the HERC RE Regulations, 2017.

Ref: Loan and Finance Charges; Return on Equity; Depreciation and Working Capital

- w) It is once again reiterated that the Loan and Finance Charges are governed by Regulation 13 of the HERC RE Regulations 2017 and it is most humbly prayed that this Commission may be pleased to allow the charges claimed by the petitioner in line with the aforesaid Regulations.

Ref: Sharing of CDM Benefits and Subsidy/ incentive by Government

- x) With regards, to the sharing of CDM benefits, it is once again reiterated that the same is governed by Clause 21.2 of the PPA dated 20.11.2020 and the same shall be governed accordingly. In this regard, Clause 21.2 of the PPA is extracted herein below:

“21.2. CARBON CREDIT

Carbon credit/ environmental benefit, except green benefits on account of renewable purchase obligations of Discoms/HPPC or Renewable Energy Certificates (RECS) or anything claimed by the HPPC in terms of this Agreement, will be shared (if any) in the manner elaborated hereunder or as amended from time to time by HERC

- a) *100% of the gross proceeds on account of environmental benefit to be retained by the Solar Power Developer in the first year after the Commercial Operation Date of the Solar Power Project;*
b) *In the second year, the share of the beneficiaries shall be 10% which shall be progressively increased by 10% every year till it reaches 50%, where after the proceeds shall be shared in equal proportion, by the Solar Power Developer and the beneficiaries.”*

- y) With regard to the subsidy/ incentives if availed by the petitioner, the same shall be governed by the Regulation 21 of the HERC RE Regulations 2017, which is extracted hereunder:

“21. Subsidy or incentive by the Central / State Government. – 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 under these Regulations.”

Ref: Calculations as per RE Regulations, 2021

- z) Without prejudice to the fact that the petitioner ought to be governed by HERC RE Regulations, 2017, as brought out above, the petitioner herein is annexing the cost of the financial model of the petitioner as per RE Regulations, 2021.

PROCEEDINGS:

6. The case was finally heard on 22.09.2021. The petitioner mainly reiterated the contents of its reply dated 08.09.2021. The respondent (HPPC) pleading that it may be allowed

to file its rejoinder in terms of the interim order of the Commission dated 08.09.2021. The Commission allowed HPPC as well as the petitioner to file their written arguments the same day itself. Accordingly, HPPC filed its rejoinder dated 22.09.2021, submitting as under:-

- a) Applicability of HERC RE, Regulations, 2021 – The Commission in Order dated 17.09.2021 passed in PRO-70 of 2020 categorically observed that Commission observed that the tariff u/s 62 of the Electricity Act, 2003 has to be determined in line with the relevant provisions of the prevailing HERC RE Regulations 2021 for projects commercially operated during the control period of FY 2021-22 to FY 2024-25. Further, the PPA executed between the parties provides that the regulations as amended from time to time will be applicable on the parties. The relevant term of the PPA reads as under –

“The terms and conditions of this Agreement are subject to the provisions of the Act and also subject to relevant regulations, if any, issued by the HERC from time to time.”

- b) Further, HERC RE Regulations, 2021 apply to all grid connected renewable energy projects and obligated entities in the State of Haryana. The Regulations specifically provides that *“These Regulations shall apply to the RE Power Projects set-up/to be set up in Haryana and where the tariff is determined by the Commission under section 62 of the Act for Grid connected RE Projects.....”*.

The tariff for the plant of the petitioner has to be governed as per RE Regulations, 2021.

- I. Quotation/ auction report of equipment –The Petitioner has submitted quotations for selected equipment without explaining as to what was the criterion adopted for the selection of vendors, different in rates and specifications quoted by different vendors and the financial impact assessable from the comparative analysis of relied quotations.
- II. Recent market Trends - The RE Regulations of the Hon'ble Commission categorically provides that the norms including Capital Cost, O&M expenses etc. and the tariff thereto for Solar PV / Thermal / Rooftop / Canal top / Water works, as per the technology approved by the MNRE, shall be determined on project specific basis depending on the prevalent market trend only if required i.e. in case the competitive bidding route for any reason does not take effect. In that view, the reliance placed by the Respondent on various orders of different Regulatory Commissions and the recent prices discovered for Solar Plants through competitive bidding are relevant to be considered in addressing the market cost of the components of a solar plant. It is the incumbent duty of the solar generator to envisage the cost of the plant as per these trends. The importance of the consideration of the prevailing market has been well

accepted in various orders of the Hon'ble Appellate Tribunal as well as order of the Hon'ble State Regulatory Commissions.

- III. The respondent is also placing reliance on the recent offer made by SECI for supply of solar power in the State of Haryana. The SECI has recently on 02.09.2021 submitted an offer for supply of solar power to HPPC from various ISTS Solar Tranches at a tariff ranging from Rs. 2.36 per unit to Rs. 2.54 per unit. Sale of power has been offered at Rs. 2.37 per unit which is without considering impact of Basic Custom Duty (BCD) proposed on solar cells and modules proposed since from 01.04.2022. The price trend evolved through competitive bidding under section 63 of the Electricity Act, 2003 is a reflection/indication of Capital Cost as well as recurring cost thereafter associated with the Project. Thus, it would be incorrect on part of Petitioner to say that the tariff discovered under competitive bidding cannot be considered for analysis. Further, the tariff quoted by SECI is inclusive of corporate taxes which as per HERC Regulations are to be paid separately as a pass-through expense.
- IV. Impact of the outbreak of COVID-19 on the process of equipment's materials - It is the case of the Petitioner that the Petitioner had to incur higher price than that was prevailing prior to the outbreak of Covid-19 due to increasing trends of steel, cement and labour prices. Further, from the graph of prices relied upon by the Petitioner depicts price trends from 01.10.2020 to 21.06.2021, whereas the invoices placed on record from procurement of transformer mentions the Order date as Feb 2020 - July 2020. Further, the Petitioner has failed to elaborate and explain as to how much has the alleged increase in price of material impacted the capital cost of the petitioner. In absence of any comparative table of Pre and Post COVID price vis-à-vis the actual process incurred by the petitioner backed by adequate proof, the contentions raised by the petitioner are vague and not worthy of any consideration. The prices of iron and steel during March, 2020 to September, 2020 had been decreasing. Meaning thereby, the alleged increase in the steel prices are of no impact in the case of the petitioner as the purchase order for the structures have already been placed when the steel prices were declining. Thus, reference to standalone increase in prices of materials is misleading and fails to reflect the correct position regarding market trend of cost of Solar Power Plant.
- V. Status of the Project –The petitioner may be directed to update on completion of the project prior to passing of Order in the present petition.
- VI. Cost of PV modules:- The petitioner has proposed to install solar panels aggregating capacity of 50 MW Capacity. As per revised break-up of the capital cost filed by the petitioner, the committed price of the solar modules have been

reduced from Rs. 98,32,36,250/- to Rs. 90,84,02,738/-. The CA certificate filed by the Petitioner is not an adequate proof of the costs expended. The Certificate also mentions that the costs have been certified "*on the basis of examination of the information, records and management representation made available of the applicant...*". Thus, the petitioner may be asked to submit proofs of payment duly certified by the auditor for consideration in the present proceedings.

- c) Module Supply Agreement placed on record by the petitioner is dated 02.08.2021. The Safeguard Duty (SGD), which was imposed on solar cells and module imports for the past two years, expired in July 2021 and the Basic Customs Duty (BCD), announced by the Central Government, will kick in only after 31.03.2022. In recent tenders, project developers have started quoting competitive tariffs in anticipation of taking advantage of the duty-free period by importing low-cost material. Thus, the costs of panel will be free of safeguard duty in the current period and the said reduction of 15% cost shall be applied to the market prices to arrive at the capital cost of the Plant.
- i. Cost of Civil works – The "Committed Cost" of the Civil works has been shown by the Petitioner as Rs. 25,72,64,218/-. The plant was originally envisaged to be set up for 65 MW DC capacity against contracted capacity of 50 MW AC. The layout of the plant was designed for 65 MW capacity. Therefore, the structures installed on site are for 65 MW capacity. However, since the operation capacity of the Plant is 50 MW, the proportionate cost of civil works as per market trends shall be considered by the Commission for determination of tariff. The petitioner, in its submissions dated 07.09.2021 has wrongly stated that the respondent has not disputed the costs given by the petition, as also the basis thereof. Similar incorrect averment has been made for costs towards corporate engineering and procurement etc. The respondent, in its submissions, had specifically submitted that costs given by the petitioner for civil works are arbitrary and unsubstantiated. The petitioner has claimed total cost of Rs. 26.36 crore on account of civil works whereas in the case of similarly placed generator, i.e. M/s Amplus Sun Solutions Pvt. Ltd., the cost claimed under this head was limited to Rs. 22.76 crore against DC capacity of 75 MW.
- ii. Cost of Land –The plant of the petitioner has been voluntarily set up on purchased land. The petitioner has submitted that an amount of Rs. 20,52,48,334 has been incurred for purchase of 218 acres of land. The plant was originally envisaged to be set up for 65 MW capacity. The layout of the plant was designed for 65 MW capacity and therefore, the land was purchased considering the said capacity. The petitioner may be directed to submit relevant layouts indicating the space kept for future expansion. The option to purchase land has been exercised by the Petitioner at its own will. However, the land is a non-depreciating asset and as

such instead of considering the cost of land for tariff determination, the Commission may consider the lower of lease rentals in the area or interest on investment on land.

- iii. The petitioner has wrongly compared its case with the case of M/s Amplus Sun Solutions Pvt. Ltd., insofar as the area of land is setting up of project is considered. It is pertinent to note that the 260 acres land used by M/s Amplus Sun Solutions Pvt. Ltd. is for 75 MW DC capacity whereas the 218 acres of land purchased by the Petitioner is for 65 MW DC capacity. Cost attributed to usage be land needs to be apportioned accordingly.
- iv. Capital cost and CUF of the Project are interlinked - The capital cost of solar project is related to CUF as higher CUF can be achieved by adding solar panels. The Commission also observed that HERC RE Regulations, 2021, specifies the minimum acceptable capacity utilization factor of 21% for solar PV power projects. In the earlier submissions, the respondent had provided for the reverse calculation based on order of PM KUSUM Scheme. The said calculation was made considering the amount at Rs. 2.25 crores per MW with CUF of 17.292 % as proposed by the petitioner albeit inclusive of cost associated with degradation factor. However, considering the ratio of order of the Commission in PRO- 70 of 2020, a copy of the reverse calculation done by the respondent for the purpose of working out capital cost based on AC CUF of 21% is attached, which provides the capital cost as Rs. 3.002 crores per MW.
- v. O&M Cost of the Plant:- As per RE Regulations, 2021, the Commission has to determine O&M expenses as per the market trend. In the recent Order of the Commission has fairly and justly approved O&M expenses of Rs. 0.303 Million / MW inclusive of insurance and all taxes and levies for first year with escalation of 2.93% per annum. The O&M expenses for the plant of the petitioner shall also be approved at par by grossing up the O&M with the proposed DC capacity of plant.

Commission's Order:-

7. The Commission heard the arguments of the parties at length as well as perused the written submissions placed on record by them. HPPC, in its submissions has pointed out that escalation in O&M expenses should be allowed @ 2.93%, as per the relevant provisions of Clause 49 (2) of HERC RE Regulations, 2021. The Commission observes that '*Haryana Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources, Renewable Purchase Obligation and Renewable Energy Certificate) Regulations, 2021 (HERC RE Regulations, 2021)*' have been notified on 30.04.2021, for the control period from the FY 2021-22 to FY 2024-25. Since, the project of the petitioner has not achieved CoD

till 30.04.2021 and is expected to achieve the same in the FY 2021-22, the norms specified in the 'HERC RE Regulations, 2021' shall be applicable as against 'HERC RE Regulations, 2017' pleaded by the petitioner in its present petition. The Commission has carefully examined the regulations occupying the field; second Proviso to Regulation no. 47 of HERC RE Regulations, 2021 provides that the norms including Capital Cost, O&M expenses etc. shall be determined on the basis of prevalent market trend. The broad guidelines of the relevant regulations are reproduced as under: -

“48. Capacity Utilization Factor. – *The Commission shall approve capacity utilization factor for project specific tariff determination.*

Provided that the minimum capacity utilization factor for Solar PV project including floating solar project shall be 21%.

Provided that the minimum capacity utilization factor for Solar Thermal project shall be 23%.

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 2.93% per annum.

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

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

a) **CUF:**

The petitioner has claimed CUF @ 17.119% (i.e. 17.292% for first year of operation with provision of 1% for grid unavailability) based on the PVSYST simulations for its 50 MW AC capacity project with module capacity of 50 MW (DC capacity) i.e. AC:DC ratio of 1:1. The petitioner has pleaded that keeping in view the order passed by the Commission in PRO-59 of 2020, wherein the cost associated with additional DC capacity was not considered/ disallowed, the petitioner decided to install the plant with 1:1 AC/DC ratio with reduced CUF of 17.119%. In case the minimum 21% CUF is to be achieved in terms of RE Regulations 2021, the petitioner would be required to install additional DC capacity to achieve the required minimum CUF.

The Commission, in its Order dated 18.01.2021 in the matter of tariff determination of similarly placed Solar PV Power generator in case no. HERC/PRO-59 of 2020 (M/s. Amplus Sun Solutions Pvt. Ltd.) had rejected the adjustment of the petitioner in the CUF, towards plant unavailability (0.50%) and system unavailability (1%). The Commission, in its ibid order, had decided that

“it is not inclined to build in compensation for grid unavailability by adjusting the CUF.

“However, over the project life cycle, 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”.

Similar view has been taken by the Commission in its order dated 17.09.2021 in case no. HERC/PRO-70 of 2020 (M/s. L.R. Energy).

Accordingly, CUF is not required to be adjusted for system unavailability. The Commission further observes that HERC RE Regulations, 2021, specifies the minimum acceptable capacity utilization factor of 21% for solar PV power projects. The Commission further notes that Regulation 6(3) of HERC RE Regulations, 2021 is applicable for grid connected RE projects up to an installed capacity of 2 MW only. The relevant provision is reproduced hereunder:-

“(3) Scope and extent of application:

These Regulations shall apply to the RE Power Projects set-up / to be set-up in Haryana and where the tariff is determined by the Commission u/s 62 of the Act for Grid Connected RE Projects up to installed capacity of 2 MW except for the general provisions for banking, RPO, Late Payment surcharge / rebate etc. applicable for all concerned.” (Emphasis supplied)

Therefore, for the RE projects exceeding 2 MW capacity, the RE Regulations, 2021 does not have binding force.

The Commission finds some force in the argument of the petitioner that as per PPA executed with HPPC dated 20.11.2020, penalty is payable for shortfall in the achievement of declared CUF; declared CUF has been defined in the PPA as the CUF declared by the solar power developer (SPD). The relevant clauses of the PPA are reproduced here under:-

“2.1.12 “Declared CUF” shall mean the CUF declared by the SPD and considered by the HERC for the purpose of determination of tariff for the Solar Power Project.” (Emphasis supplied)

“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” (Emphasis supplied)

In view of the above mentioned PPA clause read with provisions of HERC RE Regulations, 2021, it evinces that it is for the generator to declare CUF based on the DC capacity installed by it. The penalty is to be paid by the generator for non-achievement of the declared CUF. The generator may, if so desires, install a higher DC capacity and based on that may declare higher CUF so that the cost of installation of additional DC capacity is compensated by the additional revenue generated by declaring higher CUF. However, the capital cost has to be reckoned with on AC capacity and not on DC capacity, as additional modules may be deployed by some developers to optimize the performance of the plant, especially inverters. Resultantly, additional units of electricity may be generated with extra module capacity resulting in higher earnings from feed-in-tariff.

In terms of the above discussions, the Commission approves CUF @ 17.292% AC, as declared by the petitioner, with an annual degradation of 0.50%.

b) Capital cost:

The petitioner has claimed capital cost of Rs. 189.04 Crore, as per the details provided below:-

Sr. No.	Particulars	Rs. Crore
1	Solar Module and related cost	98.32
2	Power Conditioning Unit	5.38
3	Plant & machinery	15.05
4	Site Expense	1.41
5	Civil works	26.37
6	Studies & Investigation	0.28
7	Statutory fees	0.45
8	Other Expense inclusive of Insurance/tools & tackles/establishment/security	1.55
9	Evacuation Infra	12.97
10	Cost incurred for Corporate Engineering and Procurement	1.90
11	Cost incurred for purchase of land through sale deeds	20.52
	Sub Total	184.20
	IDC	4.84
TOTAL		189.04

The petitioner in its submissions dated 08.09.2021 has revised the capital cost to Rs. 182.767 crores, on account of negotiation with new vendor of solar module.

The intervener HPPC, has vehemently countered the capital cost claimed by the petitioner amounting to Rs. 182.767 Crore, citing orders of various State Commissions, wherein capital cost per MW has been approved significantly lower than that claimed by the petitioner herein. Specific objections have been raised by HPPC on excessive capital cost claimed by the petitioner w.r.t. solar modules, civil works and land.

The Commission has considered the submissions of the petitioner as well as the objections raised filed the intervener. At the outset, the Commission tends to agree with the objections raised by HPPC that the petitioner should have taken the decision of purchasing 218 acres of land at the cost of Rs. 20.52 crore, after analysing both lease rentals vis-à-vis cost of land to ensure its cost effectiveness for the project. The Commission, in its order dated 17.09.2021 (HERC/PRO-70 of 2020 – M/s. L.R. Energy) has approved the lease rent for 20 MW AC (24 MW DC) capacity. Net present value of the lease rent of land for 25 years, increasing the same proportionately for 50 MW and discounting at 10.50%, has been calculated at Rs. 7.91 crore. Comparing the same with the cost of land amounting to Rs. 20.52 crores claimed by the petitioner, it can be safely concluded that lease rent was the cheapest option. The petitioner has not given any justification for incurring unwarranted expenditure on purchasing land instead of taking the same on lease. The consumers of electricity in Haryana, ought not to be burdened by way of higher tariff due to imprudent decision of the petitioner. Accordingly, the Commission is not inclined to allow land cost amounting to Rs. 20.52 crores claimed by the petitioner. Instead, lease rent allowed by the Commission in its order dated 17.09.2021 (HERC/PRO-70 of 2020 – M/s. L.R. Energy) for 20 MW AC (91.78 Acres) capacity, increasing the same proportionately for 50 MW, has been considered for the purpose of tariff determination in the present case.

The Commission has carefully examined the contentions of the parties and observes that the Commission in its order dated 18.01.2021 (PRO-59 of 2020), while determining levelized tariff for its 50 MW AC (75 MW DC) power plant, has determined capital cost at Rs. 3.825 crore/ MW (50 MW AC). Further, the capital cost determined for 20 MW AC (24 MW DC) power plant, in Commission's order dated 17.09.2021 is Rs. 3.574 crore/MW (20 MW AC).

As against this, the petitioner has claimed capital cost of Rs. 182.767 crore i.e. Rs. 3.655 Crore/MW (50 MW AC). Out of the capital cost of Rs. 182.767 crore, land cost is Rs. 20.52 crore, which has been disallowed. Therefore, approved capital cost works out to Rs. 162.24 crore at Rs. 3.245 Crore/MW (rounded off), which is least amongst the similarly placed Solar PV power generators, whose tariff was recently determined by the Commission. Therefore, the Commission accepts the capital cost claimed by the petitioner i.e. Rs. 162.243 crore.

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

The petitioner has claimed O&M expenses @ Rs. 3.92 lacs/MW for first year of operation, including insurance expenses & taxes with escalation of 2.93% p.a., as per the HERC RE Regulations, 2021.

Per-contra, HPPC has submitted that the Commission, in its recent orders in the matter involving determination of tariff of similarly placed generators, has fairly and justly approved O&M expenses of Rs. 0.303 Million / MW inclusive of Insurance and all taxes and levies for first year with escalation of 2.93% per annum. HPPC has prayed that the O&M expenses for the plant of the petitioner herein may also be approved at par by grossing up the said O&M expenses with the proposed plant capacity i.e. 50 MWp.

The Commission observes that regulations 49 (1) of the HERC RE Regulations, 2021 provides that O&M Expenses shall be allowed based on the prevalent market conditions.

The Commission has considered the rival submissions on the aforesaid issue and reiterates 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. Accepting the submissions of HPPC, the Commission in its Order dated 18.01.2021 in case no. HERC/PRO-59 of 2020 (in the matter of M/s. Amplus Sun Solutions Pvt. Ltd.) & in the Order dated 17.09.2021 in case no. HERC/PRO-70 of 2020 (in the matter of M/s. L.R. Energy Pvt. Ltd.), has considered O&M expenses at Rs. 30.30 Millions/MW on the AC capacity for the purpose of tariff determination. Therefore, grossing up of the same with the DC capacity of those plants, as suggested by the intervener, is not relevant.

In view of the above, 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 @ 2.93% per annum, as per the relevant provisions of HERC RE Regulations, 2021.

d) **Debt Equity Ratio:**

Regarding capital structure, regulation 12 of the HERC RE Regulations, 2021, provides as under:-

- (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.

The Commission observes that the petitioner, in its reply dated 08.09.2021, has revised the Debt-Equity ratio to 75:25 and has proposed to pass on the benefit of reduced tariff to the respondent as well as electricity consumers at large.

Accordingly, in line with the RE Regulations, 2021, the Commission shall consider 25% of the approved capital cost as equity eligible for RoE and balance i.e. 75% shall be considered as loan eligible for interest, for the purpose of tariff determination.

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

The Commission has examined the relevant provisions of HERC RE Regulations, 2021 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. January, 2021-June, 2021, is 7.00%. Consequently, as per HERC RE Regulations, 2021, interest on term loan & working capital, for the purpose of tariff determination shall be pegged at 9% (i.e. Average SBI MCLR (one-year tenor) plus a margin of up to 200 basis points i.e. 2%).

However, the Commission further observes that the petitioner has tied up term loan from Bank of Baroda. The term loan agreement with Bank of Baroda, dated 12.03.2021, submitted by the petitioner, provides the rate of interest for term loan as 8.75%/8.5% p.a. subject to external rating of BBB (+-)/A- of the Company. Regulation 6.2 of HERC RE Regulations, 2021 provides that the financial and operational norms specified in these Regulations shall be ceiling norms, while determining the project specific tariff.

The petitioner has submitted that external credit rating has not yet been carried out; however, since the Company is in inception stage and will be going in its first year of commercial operation, its credit rating will not be better than BBB-.

The Commission, given the fact that with the tariff including RoE determined by the Commission and taxes (as per actual) made pass through, will provide a lot more certainty and stability to the revenue stream throughout the useful life of the project thereby favorably impacting the credit worthiness of the project, approves interest on term loan at 8.50% p.a. and interest on working capital also at 8.50% p.a. Further, discounting factor for working out levelized tariff shall be the weighted average cost of capital (75:25) i.e. 9.88%.

f) **Other factors:-**

Other factors relevant for determination of tariff shall be as per the norms specified in the HERC RE Regulations, 2021. Regulation No. 13 ,14 & 15 of the HERC RE Regulations, 2021, provides as under:-

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.*

14. Depreciation. –

- (1) *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%.*

Provided that, no depreciation shall be allowed to the extent of grant or capital subsidy received for the project. Provided further that land is not a depreciable asset, and hence, its cost shall be excluded while computing 90% of the original cost of asset eligible for depreciation.

- (2) *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 charged on the capital cost and the remaining depreciation (i.e. 90% of the capital cost as reduced by the depreciation charged in first 13 years) shall be spread over the remaining useful life of the project from 14th year onwards.*

- (3) *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.

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."

Based on the parameters discussed and approved in the foregoing paragraphs, the Commission determines the tariff for 25 years useful life of the project, appended to the present order (Annexure – A).

In terms of the above Order, the present petition as well as IAs, are disposed of.

This Order is signed, dated and issued by the Haryana Electricity Regulatory Commission on 11.11.2021.

Date: 11.11.2021
Place: Panchkula

(Naresh Sardana)
Member

(R.K. Pachnanda)
Chairman

HERC

Tariff for 50 MWp (AC) Aavaad Green HN Projects

ANNEXURE - A

Table of Parameters																											
Capacity (MWp)	50																										
Capital cost (Rs. 32.4486 Per MW in	1622.43																										
Residual value (10%) Rs. Million	162.243																										
Total depreciation (Rs. Million)	1460.19																										
Loan component (75%) Rs. Million	1216.82																										
Equity component (25%) Rs. Million	405.61																										
Annual Depreciation (%)	0.50%																										
Capacity Utilization Factor (CUF) (%)	17.29%																										
O&M (Rs. 0.303 Million / MW)	15.15																										
O&M escalation	2.93%																										
Depreciation (1st 13 years)	5.38%																										
ROE (1st 10 years)	14%																										
ROE (11th year onwards)	14%																										
Income tax / MAT (Actual)																											
Interest on term loan	8.50%																										
Interest on working capital	8.50%																										
Discount rate (WACC)	9.88%																										
Levelised tariff (Rs./kWh)	2.86																										
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 (escalation from the 2nd years of	15.15	15.59	16.05	16.52	17.01	17.50	18.02	18.54	19.09	19.65	20.22	20.81	21.42	22.05	22.70	23.36	24.05	24.75	25.48	26.22	26.99	27.78	28.60	29.44	30.30		
Outstanding Loan amount (Rs. Mn)	1216.82	1123.22	1029.62	936.02	842.42	748.81	655.21	561.61	468.01	374.41	280.81	187.20	93.60														
Loan repayment (Rs. Mn)	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60	93.60														
Interest on loan (Rs. Mn)	99.45	91.50	83.54	75.58	67.63	59.67	51.71	43.76	35.80	27.85	19.89	11.93	3.98														
Working Capital (Rs. Mn)																											
One month O&M & Lease Rental	1.89	1.93	1.97	2.01	2.05	2.13	2.18	2.22	2.27	2.31	2.41	2.46	2.51	2.56	2.61	2.72	2.78	2.84	2.90	2.96	3.08	3.14	3.21	3.28	3.35		
2 Months receivables	45.07	43.80	42.54	41.27	40.01	38.84	37.59	36.33	35.08	33.83	32.68	31.44	30.20	19.47	19.58	19.79	19.91	20.03	20.16	20.29	20.53	20.67	20.81	20.95	21.10		
Maintenance spares 15% of O&M	2.27	2.34	2.41	2.48	2.55	2.63	2.70	2.78	2.86	2.95	3.03	3.12	3.21	3.31	3.40	3.50	3.61	3.71	3.82	3.93	4.05	4.17	4.29	4.42	4.54		
Total	49.24	48.07	46.92	45.76	44.61	43.60	42.47	41.34	40.21	39.09	38.13	37.02	35.92	25.33	25.60	26.02	26.30	26.58	26.88	27.18	27.66	27.98	28.31	28.65	29.00		
Interest on working capital	4.19	4.09	3.99	3.89	3.79	3.71	3.61	3.51	3.42	3.32	3.24	3.15	3.05	2.15	2.18	2.21	2.24	2.26	2.28	2.31	2.35	2.38	2.41	2.44	2.46		
Particulars	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 (%) 0.5% Module Depreciation	17.29%	17.21%	17.12%	17.03%	16.95%	16.86%	16.78%	16.70%	16.61%	16.53%	16.45%	16.36%	16.28%	16.20%	16.12%	16.04%	15.96%	15.88%	15.80%	15.72%	15.64%	15.56%	15.49%	15.41%	15.33%		
Generation (Million Units)	75.74	75.36	74.98	74.61	74.24	73.86	73.50	73.13	72.76	72.40	72.04	71.68	71.32	70.96	70.61	70.25	69.90	69.55	69.20	68.86	68.51	68.17	67.83	67.49	67.15		
Aux Energys 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%	0.25%		
Generation (Ex-clus Million Units)	75.55	75.17	74.80	74.42	74.05	73.68	73.31	72.94	72.58	72.22	71.86	71.50	71.14	70.78	70.43	70.08	69.73	69.38	69.03	68.69	68.34	68.00	67.66	67.32	66.99		
Fixed Cost (Rs. Mn)																											
O&M Expenses	15.15	15.59	16.05	16.52	17.01	17.50	18.02	18.54	19.09	19.65	20.22	20.81	21.42	22.05	22.70	23.36	24.05	24.75	25.48	26.22	26.99	27.78	28.60	29.44	30.30		
Depreciation	87.29	87.29	87.29	87.29	87.29	87.29	87.29	87.29	87.29	87.29	87.29	87.29	87.29	27.12	27.12	27.12	27.12	27.12	27.12	27.12	27.12	27.12	27.12	27.12	27.12		
Land Lease Rental	7.58	7.58	7.58	7.58	7.58	8.11	8.11	8.11	8.11	8.11	8.68	8.68	8.68	8.68	8.68	9.29	9.29	9.29	9.29	9.29	9.94	9.94	9.94	9.94	9.94		
Interest on Term Loan	99.45	91.50	83.54	75.58	67.63	59.67	51.71	43.76	35.80	27.85	19.89	11.93	3.98														
Interest on Working Capital	4.19	4.09	3.99	3.89	3.79	3.71	3.61	3.51	3.42	3.32	3.24	3.15	3.05	2.15	2.18	2.21	2.24	2.26	2.28	2.31	2.35	2.38	2.41	2.44	2.46		
Return on Equity	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79	56.79		
Income tax on ROE																											
Fixed Cost (Rs. Mn)	270.44	262.83	255.23	247.65	240.08	233.06	225.52	218.00	210.49	203.00	196.10	188.65	181.21	116.79	117.46	118.77	119.48	120.21	120.96	121.73	123.19	124.00	124.85	125.71	126.61		
Year to year Tariff (Rs/kWh)	3.58	3.50	3.41	3.33	3.24	3.16	3.08	2.99	2.90	2.81	2.73	2.64	2.55	1.65	1.67	1.69	1.71	1.73	1.75	1.77	1.80	1.82	1.85	1.87	1.89		
Per unit tariff components (Rs. / kWh)																											
Per unit O&M Expenses	0.20	0.21	0.21	0.22	0.23	0.24	0.25	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.32	0.33	0.34	0.36	0.37	0.38	0.39	0.41	0.42	0.44	0.45		
Per Unit Depreciation	1.16	1.16	1.17	1.17	1.18	1.18	1.19	1.20	1.21	1.21	1.22	1.22	1.23	0.38	0.39	0.39	0.39	0.39	0.39	0.39	0.40	0.40	0.40	0.40	0.40		
Per Unit Land Lease Rental	0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.14	0.15	0.15	0.15	0.15	0.15		
Per Unit Interest on term loan	1.32	1.22	1.12	1.02	0.91	0.81	0.71	0.60	0.49	0.39	0.28	0.17	0.06	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	0.06	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04		
Per Unit Return on equity	0.75	0.76	0.76	0.76	0.77	0.77	0.77	0.78	0.78	0.79	0.79	0.79	0.80	0.80	0.81	0.81	0.81	0.82	0.82	0.83	0.83	0.84	0.84	0.84	0.85		
Levelised Tariff Computation																											
Discount factor @ 9.88%	1.00	0.91	0.83	0.75	0.69	0.62	0.57	0.52	0.47	0.43	0.39	0.35	0.32	0.29	0.27	0.24	0.22	0.20	0.18	0.17	0.15	0.14	0.13	0.11	0.10		
Discounted tariff component (Rs /	3.58	3.18	2.83	2.51	2.22	1.98	1.75	1.55	1.37	1.20	1.06	0.94	0.82	0.49	0.45	0.41	0.38	0.35	0.32	0.30	0.27	0.25	0.23	0.21	0.20		
Levelised Tariff (Rs / kWh)	2.86																										