



ASSAM ELECTRICITY REGULATORY COMMISSION

FILE NO. AERC.515/2015/ Pt-I

PETITION NO. 25/2015 & IA No. 17/2016

ORDER SHEET

17.11.2016

Before the Assam Electricity Regulatory Commission

ASEB Campus, Dwarandhar,
G. S. Road, Sixth Mile, Guwahati – 781 022

Surjourja Infratech Pvt. Ltd

----- Petitioner

Assam Power Distribution Co. Ltd. (APDCL)

----- Respondent1

Assam Electricity Grid Corporation Ltd. (AEGCL)

----- Respondent2

In the matter of

Determination of Tariff for sale of Power from 15 MW Grid Connected Solar PV Power Plant of SurjoUrja Infratech Pvt. Ltd to APDCL to be set-up at Bhoraguri, Chalchali Mouza, Nagaon, Assam.

ORDER

1. Background:

The SurjoUrja Infratech Pvt. Ltd (hereinafter referred to as the “Petitioner”), filed a Tariff petition on 16/10/2015 before the Commission along with Detailed Project Report (DPR) for determination of Tariff for its proposed 15 MW grid connected Solar PV Power Plant to be set-up at Bhoraguri, Chalchali Mouza, Nagaon, Assam under section 62 of Electricity Act, 2003 and the relevant regulations of AERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources), 2012. A Memorandum of Understanding (MoU) was signed with APDCL on 03/09/2015 for sale of 15 MW power to APDCL.

2. Procedural History:

2.1 The salient points of the Petition (25/2015) are:

- a. The Petitioner has proposed to set up 15 MW Solar PV project at Bhoraguri, Chalchali Mouza, Nagaon, Assam, the salient features of the project are:
 - Capital cost -Rs.9.19 Cr/MW
 - Capacity Utilization Factor (CUF)-16.60%
 - PV module-Poly Crystalline type with module capacity of 300 Wp
 - Annual Energy Generation (Injection to the grid)
 - As per Petition- 21.90 MU
 - As per PVSyst Simulation report- 21.90 MU
 - Tariff Proposed-Rs 12.02/kWh.
 - The Power generated will be injected at 132 kV level & will be fed to the 33/132/220 Samaguri Grid substation, Nagaon with line length of 20km.

- b. The Petitioner has mentioned that power generated from the plant will be sold to APDCL. A copy of Memorandum of Understanding (MoU), signed with APDCL on 03/09/2015 for sale of power was submitted, which was having a validity of 1 year.
 - c. No proper land related documents were submitted.
- 2.2** After preliminary scrutiny of the Petition, vide Letter dated 05/12/2015, the following submissions were sought for:
 - a. Land Lease deed/Sale deed in the name of the developer showing land cost.
 - b. A detail copy of land schedule as the petitioner didn't submit any land related documents along with the petition.
 - c. Land value assessment from competent Government authority.
 - d. The Petitioner was directed for submit detail Evacuation of plan from competent authority.
- 2.3** On 09/12/2015, the petitioner submitted an Interlocutory petition (registered as IA 17 of 2016) along with revised DPR (levellized tariff calculation), addendum to MoU with APDCL and agreement copy of the land by changing project location to Bhoraguri, Nagaon. The salient points of IA 17/2016 are:
 - a. Project Cost of Rs 8.76 Cr/MW
 - b. Capacity Utilisation Factor (CUF)- 16.60%
 - c. Annual Energy Generation (Injection to the grid)
 - As per IA- 21.76MU
 - As per PVSyst Simulation report- 21.93MU
 - d. Levellised Tariff of Rs 11.53/kWh
 - e. As per the submitted Land Documents, the Petitioner proposed to purchase 206.1 Bigha of Land at the prevailing circle rate.
- 2.4** In the meanwhile, the Petitioner submitted reply to the query of the Commission on 17/12/2015. The salient points submitted by the Petitioner are:
 - a. The project site is changed to Bhoraguri, Nagaon
 - b. The Petitioner intimated the Commission that AEGCL was requested for undertaking study with regard to Evacuation of Power.
- 2.5** Thereafter, the Commission directed the Petitioner for submission Sale Deed/Lease Deed in the name of the developer. The Petitioner replied to the same on 27/04/2016 and submitted that they have entered into MoU with the Land owners and the sale deed will be executed after obtaining all the requisite clearances and the Provisional Tariff is approved by the Commission.
- 2.6** On 27/04/2016 & 30/05/2016, the Petitioner submitted 37 no of Land MoU, with a total area of 202 Bigha 111 Katha 477 Lessa. Further, the Petitioner also submitted a zonal valuation certification from the circle officer and as per which the zonal value was Rs 60,000 per Bigha.
- 2.7** Thereafter, on 17/06/2016, the Commission raised certain queries, the salient points are:
 - a. Clarification with regard to Agricultural/Non-Agricultural status
 - b. Detail break-up of project cost
 - c. Power Evacuation plan
- 2.8** In the meanwhile, vide notice dated 18/08/2016 a preliminary Hearing was schedule on 29/08/2016. Further, vide letter dated 18/08/2016, APDCL was directed to submit their views and comments on the petition filed by the Petitioner.
- 2.9** As scheduled, preliminary Hearing was conducted on 29/08/2016 and the key directives issued are stated below:
 - a. The Commission directed the Petitioner and the Respondents (APDCL and AEGCL) to have a joint meeting and to arrive at a mutually acceptable decision

on the power evacuation plan. The Commission also asked both the parties to sort out all other technical matters.

- b. The Commission directed the Petitioner to submit detail project cost break-up with proper justification etc.

The next Hearing on the matter was scheduled on 15/09/2016.

The Hearing Order is enclosed as Enclosure-I.

2.10 Thereafter, on 10/09/2016, the Petitioner submitted an Interim Application along with revised DPR (levellized tariff calculation), addendum to MoU with APDCL, Land MoU etc. The salient points of **IA 17-A/2016** are:

- a. Project Cost of Rs 7.32 Cr/MW
- b. Capacity Utilisation Factor (CUF)- 17.20%
- c. Annual Energy Generation (Injection to the grid)
 - As per IA- 22.60 MU
 - As per PVSyst Simulation report- 22.66 MU
- d. Levellised Tariff of Rs 9.38/kWh
- e. As per the submitted Land Documents, the Petitioner proposed to purchase 202 Bigha 111 Katha 477 Lessa of Land at the prevailing circle rate.
- f. As per submitted final DPR, the Petitioner proposed to evacuate the power via 132 kV line to Sankardev Nagar feeder under LILO mode. However, as per the petition, the Petitioner has proposed to evacuate the power through 9.10 km of 132 kV line to 33/132/220kV Samaguri Grid S/S.

2.11 As scheduled, the next Hearing on the matter was conducted on 15/09/2016 and the key directives issued are stated below:

- c. The Commission directed the Petitioner to reduce the Evacuation cost by way of sharing of the cost as the projects being set up by the Petitioner and Surjo Urja Infratech Pvt Ltd.
- d. The Commission directed the petitioner to get the Abridged Form of the Petition approved from the Commission and thereafter publish the notice in Newspapers for Public views & comments.

The Hearing Order is enclosed as Enclosure-II.

2.12 As per the direction in the Hearing dated 15/09/2016 the Petitioner published the approved abridged notice form of the Petition in six local daily news papers on 06/10/2016, 07/10/2016 & 08/10/2016, seeking comments and objections from Public within 21days time.

2.13 Thereafter, vide News Paper Notification dated 02/11/2016, Public Hearing on the Petition was scheduled on 09/11/2016. However, no comments from Public/Public representative were received.

2.14 On 07/11/2016, the Petitioner submitted a copy of renewed Memorandum of Understanding (MoU) between the Petitioner & APDCL, signed on 28/10/2016, with a validity of 1 year. As per the MoU, a PPA will be entered into by both the parties on mutually agreed terms, subject to requirement of Solar RPO of APDCL. Further, in the MoU, it is mentioned that all Evacuation cost from the generating station will be borne by the Petitioner.

2.15 As scheduled, a Public Hearing was held on 09/11/2016. During the Hearing, only Petitioner, Respondent1 (APDCL) & Respondent 2 (AEGCL) was present. No participant from the Public was there.

The salient points of submissions made by the Petitioner during the Public Hearing are:

- a. In reply to query regarding, the status of Evacuation plan & steps undertaken in that regard, the Petitioner submitted that to lower the evacuation cost, a

meeting was held with AEGCL & APDCL. The Petitioner was directed to submit the copy of Minutes of Meeting.

- b. Further, in reply to Query on optimization of O & M Cost, the Representatives of the Petitioner submitted that sharing of O & M Cost can be worked out after Commissioning of the project.

The Hearing Order is enclosed as Enclosure-III.

2.16 Thereafter, on 11/11/2016, as per directive of the Hearing, the Petitioner submitted a copy of the Minutes of Meeting (MoM) dated 29/08/2016 held with APDCL & AEGCL related to evacuation. As per the MoM dated 29/08/2016, APDCL & AEGCL proposed that as the projects being set up by JJ PV Solar Ltd., JP Structures Pvt. Ltd., Marahar Power Controls Ltd., Sharada Erectors Pvt. Ltd., Sharada Windpower Pvt. Ltd., Surjo Urja Infratech Pvt. Ltd. & NERE Infratech Pvt. Ltd. are located nearby, the power generated from these 7 projects can be evacuated through an interconnection pooling point. APDCL & AEGCL also stated that the cost of common infrastructure will be shared among the 7 parties.

3. Legal and Regulatory framework:

- 3.1** Section 86(1) (e) of the Electricity Act 2003, mandates the State Electricity Regulatory Commissions to promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity to any person.
- 3.2** The Electricity Act, 2003 also requires that the State Electricity Regulatory Commissions (SERCs) shall be guided by the tariff policy in specifying the terms and conditions for determination of tariff under section 61 of the Act.
- 3.3** Section 61 of the Act also provides that State Regulatory Commissions shall be guided by the principles and methodologies specified by the Central Commission for determination of tariff applicable to generating companies and transmission licensees.
- 3.4** The terms and conditions for determination of Tariff for RE project has been specified in the AERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012 (hereinafter referred as AERC RE Tariff Regulations, 2012) notified on 07.11.2012, which was in line with CERC (Terms and Conditions for tariff determination from Renewable Energy Sources) Regulations, 2012.
- 3.5** Further, in the AERC (Co-generation and Generation of Electricity from Renewable Sources of Energy) Regulations, 2015, the Technical Parameters and other Technical Considerations such as Evacuation of power, Interface line etc were specified with regard to RE projects.

4. Computation of Provisional Tariff:

4.1 Project Cost:

4.1.1 *Summary of Petitioner's submission (As per the new DPR):*

4.1.1.1 PV Module Cost: The Petitioner has proposed to install 57696 poly crystalline solar PV modules having per module output of 260Wp, leading to total output of 15MW. Considering all these, the Petitioner has proposed PV Module cost of Rs 333.90 Lakh/MW.

4.1.1.2 Land cost: The Petitioner has proposed to purchase 202 Bigha 111 Katha 477 Lessa of Land at Bhoraguri, Chalchali Mouza, Nagaon, Assam at circle rate.

The Petitioner has submitted that additional expenditure is also required for development of the proposed land, thereby considering the additional cost, the Land cost of Rs 18.30 Lakh/MW is proposed.

- 4.1.1.3 Civil & General Works: The Petitioner has submitted that the Civil & General Works cost includes equipment foundation, control room buildings, Earth excavation & RCC works, switchyard and site clearance etc. and considering the additional expenditure the Petitioner has proposed Rs 63.90 Lakh/MW as cost towards Civil & General works.
- 4.1.1.4 Mounting Structure: The Petitioner has proposed to use high value galvanized steel with proper foundation angle etc. Considering these, the Petitioner has proposed cost of Rs40.60 Lakh/MW towards module Mounting Structure.
- 4.1.1.5 Power Conditioning Unit (PCU): The Petitioner has proposed PVS 800/57/1000 kW model of Inverter. After considering these, the Petitioner has proposed for a cost of Rs 33.2 Lakh/MW towards PCU.
- 4.1.1.6 Evacuation Cost upto Interconnection Point: The Petitioner has proposed an Evacuation cost of Rs 68.97 Lakh/MW
- 4.1.1.7 Preliminary & Pre-operative expenses including IDC & Contingency: The Petitioner proposed a cost of Rs 32.90 Lakh/MW under this head, which includes IDC, specific Contingencies etc.
- 4.1.1.8 Evacuation Cost beyond Interconnection Point: The Petitioner has made 2 submissions related to Evacuation of power. As per the final DPR, the Petitioner proposed to evacuate the power via 132 kV line to Sankardev Nagar feeder under LILO mode, however, as per the **IA 17-A/2016**, the Petitioner has proposed to evacuate the power through 9.10 km of 132 kV line to 33/132/220kV Samaguri Grid S/S. The cost proposed for this head is Rs 39.43 Lakh/MW.
- 4.1.1.9 Goods & Service Tax: The Petitioner has Rs 101 Lakh/MW towards Goods & Service Tax.
- 4.1.1.10 Based on the above, the Petitioner has proposed a total project cost of Rs 732.1 Lakh/MW. The break-up of the proposed Project Cost is as follows:

SI No	Particular	Cost (Rs Lakh/MW)
1	PV Module	333.90
2	Land Cost	18.30
3	Civil & General Work (fencing, WBM Roads, Land filling)	63.90
4	Mounting Structure	40.60
5	Power Conditioning Unit (PCU)	33.20
6	Evacuation Cost Upto Interconnection Point (AC DC cables, transformers, Lightning arrestor, SCADA, HT transmission line etc.)	68.97
7	Preliminary & Pre-operative expenses including IDC & Contingency	32.90
	Project Cost upto Interconnection Point	591.77
8	<i>Evacuation Cost beyond Interconnection Point</i>	<i>39.43</i>
9	<i>Goods & Service Tax</i>	<i>101.00</i>
	Total Project Cost (Rs Lakh/MW)	732.10
	Total Project Cost for 15MW (Rs Lakh)	10981.50

4.1.2 Commission's Analysis & Decision:

4.1.2.1 PV Module Cost: The PV Module cost is market dependent and as per the present market scenario, the PV Module cost has gone down substantially. However, considering the further reduction in PV Module cost, the Commission has at present decided to adopt the CERC Benchmark of PV Module Cost applicable for FY 2016-17, as specified in CERC Order dated 23/03/2016, on provisional basis.

4.1.2.2 Land Cost: As per the submitted Land document, the Petitioner has proposed to purchase 202 Bigha 111 Katha 477 Lessa land at the circle rate. However, as per Norm the maximum allowable land for 15 MW Solar PV Project is 225 Bigha, therefore, purchase of 225 Bigha of land only is allowed.

Further, as per the Land Document, Land will be purchased by the Petitioner at the circle rate and the zonal value as per certification from Circle Officer, Govt. of Assam is Rs 60,000 per Bigha. Accordingly, Rs 9 Lakh/MW is allowed as Land cost.

The Petitioner has further proposed additional cost towards Land development. However, the Land development cost is part of Civil & General works. Therefore no separate cost is allowed towards Land development cost.

4.1.2.3 Civil & General Works: On study of the CERC Order on Benchmark Capital cost norm, it is observed that Civil cost includes cost pertaining to land development cost, building control room to house inverter and other BoS components, building approach roads, boundary wall, arranging water supply, lighting etc and General works includes security of solar farm, setting up of power back-up generator, yard lighting etc.

However, considering the additional cost towards geographical locality, topographical condition & transportation of material etc from outside Assam, it is deemed fit to allow an additional 15% escalation over the CERC Benchmark cost for FY 2016-17, as specified in CERC Order dated 23/03/2016, for this head of Expenditure.

4.1.2.4 Mounting Structure: On scrutiny of the submissions and analysis CERC order, it is deemed fit that 15% escalation over the CERC Benchmark cost for FY 2016-17, as specified in CERC Order dated 23/03/2016, will suffice for this head of Expenditure.

4.1.2.5 Power Conditioning Unit (PCU): On scrutiny of the submissions and analysis CERC order, it is deemed fit that 15% escalation over the CERC Benchmark cost for FY 2016-17, as specified in CERC Order dated 23/03/2016, will suffice for this head of Expenditure.

4.1.2.6 Evacuation Cost upto Interconnection Point: On scrutiny of the submissions and analysis CERC order, it is deemed fit that 15% escalation over the CERC Benchmark cost for FY 2016-17, as specified in CERC Order dated 23/03/2016, will suffice for this head of Expenditure.

4.1.2.7 Preliminary & Pre-operative expenses including IDC & Contingency: As per the CERC Order dated 23/03/2016, this Head of Expenditure is linked to Project Cost and allowed as a percentage of total project cost. The same principle is adopted in this case.

4.1.2.8 Evacuation Cost beyond Interconnection Point: Regarding this head of expenditure, an estimate was received from AEGCL related to cost for

132 kV D/C line. As per AEGCL estimate, the cost for construction of 132 kV D/C line is Rs 41 Lakh/MW. However, for evacuation of 15 MW power 132 S/C line is sufficient and accordingly 70% of the AEGCL estimated cost for 132 kV D/C is provisionally considered.

Further, as per the AERC (Co-generation and Generation of Electricity from Renewable Sources of Energy) Regulations, 2015, for construction of Transmission line of more than 5km, the total cost is to be equally shared between the developer & the utility. Accordingly, 50 % of allowed cost on prorata basis for 4.10KM is loaded as part of the project cost. Accordingly Rs 6.31 Lakh/MW is allowed as Evacuation Cost beyond Interconnection Point.

Further, as per Minutes of the Meeting dated 29/08/2016 related to Evacuation of Power, as referred above, APDCL & AEGCL has proposed that for 7 projects (JJ PV Solar Ltd., JP Structures Pvt. Ltd., Marahar Power Controls Ltd., Sharda Erectors Pvt. Ltd., Sharda Windpower Pvt. Ltd., SURJOURJA Infratech Pvt. Ltd. & Surjo Urja Infratech Pvt. Ltd), the power generated from these 7 projects can be evacuated through an interconnection pooling point. APDCL & AEGCL also stated that the cost of common infrastructure will be shared among the 7 parties. Therefore, the Petitioner is hereby directed to explore the proposal of APDCL & AEGCL at the time of actual implementation of the project.

4.1.2.9 Goods & Service tax: All the project cost is inclusive of taxes etc. Hence separate Goods & Service Tax not allowed.

4.1.2.10 Based on the above, the provisionally Rs 535.57Lakh/MW is approved as project cost for the Project. The break-up of the provisionally approved vis-à-vis Proposed Project Cost is as follows:

SI No	Particular	Cost (Rs Lakh/MW)	
		Proposed	Approved
1	PV Module	333.90	328.39
2	Land Cost	18.30	9.00
3	Civil & General Work (fencing, WBM Roads, Land filling)	63.90	40.25
4	Mounting Structure	40.60	40.25
5	Power Conditioning Unit (PCU)	33.20	33.20
6	Evacuation Cost Upto Interconnection Point (AC DC cables, transformers, Lightning arrestor, SCADA, HT transmission line etc.)	68.97	50.60
7	Preliminary & Pre-operative expenses including IDC & Contingency	32.90	27.57
	Project Cost upto Interconnection Point	591.77	529.26
8	<i>Evacuation Cost beyond Interconnection Point</i>	39.43	6.31
9	<i>Goods & Service Tax</i>	101.00	-

SI No	Particular	Cost (Rs Lakh/MW)	
		Proposed	Approved
	Total Project Cost (Rs Lakh/MW)	732.10	535.57
	Total Project Cost for 15MW (Rs Lakh)	10981.50	8,033.59

4.2 Technical & Financial Norm:

4.2.1 Summary of Petitioner's submission:

The Petitioner has proposed a Levellized Tariff of Rs 9.38/kWh, based on the following parameters:

- 4.2.1.1 Operation and Maintenance Cost (O & M Cost): The Petitioner has proposed O & M Cost for first year Rs 13.74 Lakh/MW with annual escalation of 5.72%.
- 4.2.1.2 Depreciation: The Petitioner has proposed 5.83% as Depreciation rate upto 12th year and 1.54% from 13th year onwards.
- 4.2.1.3 Funding Pattern: The Petitioner has proposed 30% Equity and 70% loan.
- 4.2.1.4 Return on Equity: The Petitioner has proposed 20% Pre Tax (1st 10 years) & 24% Pre-Tax (11th year onwards) as Return on Equity.
- 4.2.1.5 Interest on Loan: The Petitioner has proposed Interest rate of 12.30%, with a repayment period of 12 years.
- 4.2.1.6 Interest on Working Capital: The Petitioner has proposed 12.80% Interest on Working Capital.
- 4.2.1.7 Auxiliary Power Consumption: The Petitioner has proposed 0% Auxiliary Power Consumption.
- 4.2.1.8 Capacity Utilization Factor (CUF): The Petitioner has proposed a CUF of 17.20%.
- 4.2.1.9 Energy Generation (MU): The Petitioner has proposed Yearly net Energy Generation of 22.60 MU.
- 4.2.1.10 Annual Module Degradation: The Petitioner has proposed Module Degradation of 0.50% from 4th Year onwards.

4.2.2 Commission's Analysis & Decision:

- 4.2.2.1 Operation and Maintenance Cost (O & M Cost): As per the AERC RE Tariff Regulations, 2012, the O & M cost allowable for 1st year of operation is Rs 11 Lakh/MW. At that point of time the norm was in line with the then CERC norm for O & M cost. However, as per the CERC Generic Tariff Order for FY 2016-17, the O & M Cost for first year of operation is Rs 7 Lakh/MW with an annual escalation of 5.72%. This implies that at the national level and in general the O & M cost for Solar PV project has gone down.

Therefore, considering the change in scenario, the Commission deems it fit to reduce the O & M norm by using the provisions under Regulation 85 of the AERC RE Tariff Regulations, 2012. However, considering the additional cost requirement for the state of Assam, the Commission deems it fit to allow additional 15% cost over and above the CERC Benchmark. Accordingly, Rs 8.05 Lakh/MW is considered to be O & M cost for the 1st year of operation (Rs 7 Lakh/MW + 15% of Rs 7 Lakh/MW)

- 4.2.2.2 Depreciation: The Depreciation is allowed as per the provisions of the AERC RE Tariff Regulations, 2012.
- 4.2.2.3 Funding Pattern: The Petitioner's proposal is in line with the AERC RE Tariff Regulations, 2012 and hence considered the proposed Funding Pattern on the approved Project Cost.
- 4.2.2.4 Return on Equity: The Petitioner's proposal is in line with the AERC RE Tariff Regulations, 2012 and hence considered the proposed rate of Return on Equity.
- 4.2.2.5 Interest on Loan: As per AERC RE Tariff Regulations, 2012, the normative interest rate shall be considered as average SBI base rate prevalent during first six months of previous year plus 300 basis point. The proposed interest rate of 12.30 % is within the norm and accordingly the same is considered. Further the repayment period of 12 years proposed by the Petitioner is also as per the norm and hence allowed the same.
- 4.2.2.6 Interest on Working Capital: The Interest on Working Capital being a normative component and the Interest rate of 12.80% proposed by the Petitioner is within the norm specified in the AERC RE Tariff Regulations, 2012. Hence, the proposal is approved.
- 4.2.2.7 Auxiliary Power Consumption: The Petitioner has not proposed any Auxiliary consumption and hence, Auxiliary Power Consumption of 0% is considered as per AERC RE Tariff Regulations, 2012.
- 4.2.2.8 Capacity Utilisation Factor (CUF): The Energy Output of a Solar PV System is dependent on various factors such as Solar Irradiation at the project site, PV Module & Panel Efficiency, PCU Efficiency, Transformation Efficiency etc. As such, the net energy output is dependent on the losses at the various stages/parts. In the DPR, the Petitioner has submitted a Simulation report of PVSyst software (a software used for generating Simulation report of energy generation from Solar PV Plant) showing the losses at various stages and finally the Energy Injected into the grid.
Considering the fact that for estimation of power generation from Solar PV power plants, PVSyst, HOMER & RETScreen are the most widely used software, the Commission deems it fit to accept the PVSyst Simulation report submitted by the Petitioner and accordingly considers the Energy Injected into the grid as 22.66 MU. Based on the Energy Injection of 22.66 MU, the CUF of 17.24% is arrived at. Thereby, CUF of 17.24% is approved.
- 4.2.2.9 Energy Generation (MU): The Petitioner has proposed Yearly net Energy Generation of 22.60 MU. However, as discussed in previous clause, the Energy Injection to the grid as reflected in the PVSyst Simulation report is considered and accordingly Net Energy Generation per year of 22.66 MU approved.
- 4.2.2.10 Module Degradation: In the submitted PVSyst report, the Petitioner has accounted for Module quality loss thereby the degradation is already factored in. Further, in the CERC Generic Tariff Order for FY 2016-17, the net Energy Generation is kept same for all the 25 years of operation, without considering Degradation factor. Therefore, the Commission deems it fit not to consider separate Module Degradation.
- 4.2.2.11 Based on the above, the Technical & Financial Norms approved vis-à-vis proposed is shown in the table below:

SL No.	Particulars	UNIT	Proposed	Approved
OPERATIONAL DATA				
1	Installed Capacity	MW	15.00	15.00
2	Annual Gross Generation	MU	22.60	22.66
3	Annual Module Degradation	%	0.50%	0.00%
4	Annual Net Generation	MU	22.60	22.66
FINANCIAL DATA				
5	Total Project Cost including IDC	<u>Lakh</u>	7321.00	8033.59
6	Project Cost	Lakh/MW	732.10	535.57
7	Debt (70%)	<u>Lakh</u>	5124.70	5623.51
8	Equity (30%)	<u>Lakh</u>	2196.30	2410.08
	Total (7+8)	<u>Lakh</u>	7321.00	8033.59
9	Discount rate	%	10.48	10.64
Financial Norm				
1	O & M cost	Lakh/MW	13.74	8.05
2	Depreciation Rate	upto 12th year	5.83%	5.83%
		13th year onwards	1.5415% 13th yr onwards	Remaining Depreciation spread for the rest of life
3	ROE	%	20% Pre Tax(1st 10 years) & 24% Pre Tax (from 11th year)	20% Pre Tax(1st 10 years) & 24% Pre Tax (from 11th year)
4	Interest on Term Loan	%	12.30%	12.30%
5	Interest on working capital	%	12.80%	12.80%
6	O & M annual Escalation Rate	%	5.72%	5.72%
Technical Norm				
7	Auxiliary Power Consumption	%	0.00%	0.00%
8	CUF	%	17.20%	17.24%

4.3 Levelling Tariff:

Based on the above, the Commission has determined and approved a provisional levellised tariff of Rs. 6.24/kWh for a period of 25 years from the date of commercial operation.

Details of tariff computation are furnished in Annexure-I enclosed.

5. Other applicable conditions:

5.1 Statutory and other clearances:

All statutory clearances and necessary approvals shall be obtained by the developer for setting up of the project. The developer is also responsible for their compliance and their renewals as may be required from time to time.

5.2 Sharing of CDM benefit:

The sharing of Clean Development Mechanism (CDM) benefits shall be as per the provision of AERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2012 (Regulation 22) which is as under:

The proceeds of carbon credit from approved CDM project shall be shared between generating company and concerned beneficiaries in the following manner, namely

a) 100% of the gross proceeds on account of CDM benefit to be retained by the project developer in the first year after the date of commercial operation of the generating station;

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 generating company and the beneficiaries.

5.3 Scheduling:

The 15 MW solar PV plant of the petitioner shall be subjected to the scheduling and dispatched code specified under AERC Grid Code, as amended from time to time under Regulation 12.3 of the AERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources), 2012.

5.4 Taxes and duties:

The tariff determined under this order shall be exclusive of taxes and duties as may be levied by the state/central Govt. and the same shall be passed through on actual incurred basis as specified under Regulation 24 of the AERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources), 2012.

5.5 Evacuation of power:

Interconnection facilities and communication links are to be installed and maintained by the licensee at the interconnection points to enable evacuation of power from the project.

5.6 Determination of final tariff:

The Commission has determined the provisional tariff for the 15 MW Solar PV plant of the Petitioner. The Commission directs the petitioner to file fresh petition for determination of final tariff, immediately after Commercial Operation of the project, based on actual capital expenditure of the project incurred upto the date of commercial operation duly certified by the statutory auditors based on annual audited accounts.

With the above observations and decisions, the Tariff Petition (No. 25/2015 & IA No.17/2016) stands disposed of with fixation of the Provisional Levellised Tariff of Rs 6.24 per kWh for a period of 25 years.

Sd/-
(S. C. Das)
Member, AERC

Sd/-
(D. Chakravarty)
Member, AERC

Sd/-
(N.K. Das)
Chairperson, AERC

ANNEXURE-I

Determination of project specific Tariff for 15 MW Grid connected Solar PV Power Plan of Surjo urja Infratech Pvt. Ltd

	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	
1. Installed Capacity	MW	15.00	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	
2. Gross Generation	MU		23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	
3. Annual module degradation	MU																										
4. Auxiallary Consumption @ 0%																											
4. Net Generation	MU		22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	22.66	
Fixed Cost			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 cost	Rs. Lakh		121	128	135	143	151	159	169	178	188	199	211	223	235	249	263	278	294	311	329	347	367	388	411	434	459
Depreciation	Rs. Lakh		417	417	417	417	417	417	417	417	417	417	417	417	165	165	165	165	165	165	165	165	165	165	165	165	165
Interest on term loan	Rs. Lakh		663	605	548	490	432	375	317	259	202	144	86	29													
IWC	Rs. Lakh		40	39	39	38	37	36	35	35	34	33	35	34	29	29	30	31	32	32	33	34	35	37	38	39	40
Return on Equity	Rs. Lakh		482	482	482	482	482	482	482	482	482	482	578	578	578	578	578	578	578	578	578	578	578	578	578	578	578
Total fixed cost	Rs. Lakh		1,723	1,671	1,620	1,569	1,519	1,469	1,420	1,371	1,323	1,275	1,327	1,280	1,007	1,022	1,037	1,052	1,069	1,087	1,106	1,125	1,146	1,168	1,192	1,216	1,243
Nominal Fixed cost	Rs. /KWH		7.60	7.37	7.15	6.92	6.70	6.48	6.26	6.05	5.84	5.63	5.85	5.65	4.45	4.51	4.57	4.64	4.72	4.80	4.88	4.97	5.06	5.16	5.26	5.37	5.48
Discounted Fixed cost	Rs. /KWH		7.60	6.66	5.84	5.11	4.47	3.91	3.42	2.98	2.60	2.26	2.13	1.86	1.32	1.21	1.11	1.02	0.94	0.86	0.79	0.73	0.67	0.62	0.57	0.52	0.48
Levillised tariff corresponding to useful life																											
O & M expn	Rs. /KWH		0.53	0.56	0.60	0.63	0.67	0.70	0.74	0.79	0.83	0.88	0.93	0.98	1.04	1.10	1.16	1.23	1.30	1.37	1.45	1.53	1.62	1.71	1.81	1.92	2.02
Land Lease	Rs. /KWH		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Depreciation	Rs. /KWH		1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	1.84	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Interest on term loan	Rs. /KWH		2.93	2.67	2.42	2.16	1.91	1.65	1.40	1.14	0.89	0.64	0.38	0.13	-	-	-	-	-	-	-	-	-	-	-	-	-
IWC	Rs. /KWH		0.18	0.17	0.17	0.17	0.16	0.16	0.16	0.15	0.15	0.15	0.15	0.15	0.13	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18
ROE	Rs. /KWH		2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.13	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55	2.55
Total COG	Rs. /KWH		7.60	7.37	7.15	6.92	6.70	6.48	6.26	6.05	5.84	5.63	5.85	5.65	4.45	4.51	4.57	4.64	4.72	4.80	4.88	4.97	5.06	5.16	5.26	5.37	5.48
Discounted Levellized tariff	Rs. /KWH		6.24																								
IWC																											
a) O & M Expenses for 1 month	Rs. Lakh		10	11	11	12	13	13	14	15	16	17	18	19	20	21	22	23	25	26	27	29	31	32	34	36	38
b) Receivables equivalent to 2 months of Fixed charges	Rs. Lakh		287	278	270	261	253	245	237	228	220	213	221	213	168	170	173	175	178	181	184	188	191	195	199	203	207
c) Maintenance spares @ 15% of O & M expenses	Rs. Lakh		18	19	20	21	23	24	25	27	28	30	32	33	35	37	39	42	44	47	49	52	55	58	62	65	69
Working Capital	Rs. Lakh		315	308	301	295	288	282	276	270	264	259	270	265	223	228	234	240	247	254	261	269	277	285	294	304	314
Interest on Working Capital	Rs. Lakh		40	39	39	38	37	36	35	35	34	33	35	34	29	29	30	31	32	32	33	34	35	37	38	39	40
Discount Factor (Based on Discount rate @ 10.64%)			1.00	0.90	0.82	0.74	0.67	0.60	0.55	0.49	0.45	0.40	0.36	0.33	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15	0.13	0.12	0.11	0.10	0.09