

# **NAGALAND ELECTRICITY REGULATORY COMMISSION (NERC)**



## **PROVISIONAL TARIFF ORDER**

### **20 MW Solar Power PV Plant Tizit, Nagaland**

**Dated: 19<sup>th</sup> August, 2024**

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## Contents

ABBREVIATIONS.....	ii
Order.....	1
1. INTRODUCTION.....	3
1.1. Nagaland Electricity Regulatory Commission.....	3
1.1.1. In accordance with the provisions of the Act, the Nagaland Commission discharges the following functions:.....	3
2. SUMMARY OF TARIFF PETITION.....	6
2.1. Project Cost & Annual Fixed Charges.....	6
2.2. Prayers of Petition:.....	7
3. PUBLIC HEARING.....	8
3.1. Public Hearing.....	8
3.2. Proceedings of Public Hearing.....	8
4. PROJECT IMPLEMENTATION AND COST.....	12
4.1. Overview of the Project.....	12
4.2. Grid Connectivity (Power Evacuation).....	12
4.3. Capital Cost Petitioner’s Submission:.....	12
4.4. Commission’s Analysis:.....	14
5. Annual Fixed Charges.....	17
5.1. Overview of Annual Fixed Charges:.....	17
5.2. Operation and Maintenance Expenses:.....	17
5.3. Depreciation:.....	18
5.4. Interest on Loan Capital:.....	19
5.5. Interest on Working Capital:.....	21
5.6. Return on Equity:.....	22
6. Designed Energy.....	24
6.1. Calculation of CUF/PLF:.....	24
6.2. Useful Life of the Project:.....	25
6.3. Tariff Design.....	25
6.4. Annual Fixed Charges & Tariff:.....	26
7. Directive.....	29
8. Annexure.....	30

## Table of Contents

Table 1: Project Cost projected by petitioner (Rs. in Lakhs) .....	6
Table 2: Total Estimated Project Cost (Rs. in Lakhs) .....	12
Table 3: Approved Means of Finance (Rs. in Lakhs) .....	16
Table 4: O&M Expenses (Rs. in Lakhs) .....	18
Table 5: Depreciation (Rs. in Lakhs) .....	19
Table 6: Rate of Interest on Normative Loan (Rs. in Lakhs) .....	20
Table 7: Interest on Normative Loan (Rs. in Lakhs) .....	21
Table 8: Interest on Working Capital (Rs. in Lakhs) .....	22
Table 9: Return on Equity (Rs. in Lakhs) .....	23
Table 10: Annual Fixed Charges (Rs. in Lakhs) .....	26
Table 11: Calculation of Net Generation (in MUs) .....	27
Table 12: Approved Levellised Tariff (in Rs.) .....	27

## ABBREVIATIONS

<b>Abbreviation</b>	<b>Description</b>
ARR	Aggregate Revenue Requirement
CERC	Central Electricity Regulatory Commission
Cr.	Crores
CWIP	Capital Work in Progress
DE	Debt Equity
ER	Eastern Region
FY	Financial Year
GFA	Gross Fixed Assets
KV	Kilovolt
KW	Kilo Watt
kWh	kilo Watt hour
MU	Million Units
MW	Mega Watt
MYT	Multi Year Tariff
NER	North Eastern Region
NERC	Nagaland Electricity Regulatory Commission
NTP	National Tariff Policy
O&M	Operation & Maintenance
PLF	Plant Load Factor
PLR	Prime Lending Rate
R&M	Repairs and Maintenance
RoR	Rate of Return
Rs.	Rupees
S/s	Sub Station
SBI	State Bank of India
SERC	State Electricity Regulatory Commission
YoY	Year on Year

**Before the**  
**Nagaland Electricity Regulatory Commission (NERC)**  
**Nagaland, Kohima**

Case No: 09/2023-24

In matter of determination of levelized Tariff for Renewable Energy Generation of 20 MW Solar Power Plant in Tizit, Nagaland for a period of 25 years on Petition filed by M/s Tvaksas Renewable Pvt. Ltd., Pune.

Present: Er. Shri. Khose Sale  
Chairman-cum-Member,  
NERC, Kohima.

Petitioner: M/s Tvaksas Renewable Pvt. Ltd., Pune.

Date of filing of Petition : 26-09-2023  
Date of Admission of Petition : 24-11-2023  
Date of Hearing : 12-06-2024  
Date of Order : 19-08-2024

**Order**

1. M/s Tvaksas Renewable Pvt. Ltd., Pune, (hereinafter referred to The Petitioner) proposed to develop 20 MW Solar PV Power Plant at Tizit under Mon District.
2. The Petitioner submitted that the entire project shall be of the capacity of 100 MW and developed in phased manner. The petitioner at the first stage, prayed for the Generic Tariff for 20 MW Capacity with the Project cost of Rs. 10,001.57 Lakh and proposed levelled tariff of Rs. 4.59/Unit for 25 Years. The Petitioner proposed to complete the project in the quickest possible and proposed the date of commercial operation within 10 months from the date of approval.
3. The DPR of the Project was prepared for 100 MW Capacity. However, the Petitioner has provided the Tariff Computation for its first phase of 20 MW.

4. The Nagaland Electricity Regulatory Commission (NERC), upon following the procedures and in exercise of powers vested by Section 62(1) and Section 64 3(a) of the Electricity Act, 2003 and in accordance with the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 and other enabling provisions in this behalf, has approved the Provisional Generation Tariff of ₹ **4.12/kWh** for 25 Year subject to the following conditions:

- (a) The Tariff will be reviewed based on the submission of capital expenditure actually incurred up to the date of commercial operation duly audited and certified by the statutory auditors.
- (b) Any escalation in the tariff shall not be allowed beyond the approved tariff.
- (c) Signing of Power Purchase Agreement (PPA) between the Petitioner and the State Government/Distribution Licensee is done on timely manner.
- (d) The Execution and Commissioning is completed within the scheduled time prescribed in the DPR failing which the Petitioner shall apply for time extension specifying the reason of delay in execution of the project.

5. **Power Evacuation (Grid Connectivity):**

The evacuation of power from the said PV Solar Power Plant shall be at the level of 33 KV through the 66/33/11 KV Sub-Station at Tizit, Mon.

Place: Kohima, Nagaland.

Date: 19-08-2024.

Sd/-

**KHOSE SALE**

Chairman-cum-Member,  
NERC, Kohima.

## **1. INTRODUCTION**

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### **1.1. Nagaland Electricity Regulatory Commission**

In exercise of the powers conferred by the Electricity Act, 2003, the State Government of Nagaland constituted an Electricity Regulatory Commission to be known as “Nagaland Electricity Regulatory Commission” for the State of Nagaland, as notified on 21<sup>st</sup> February, 2008.

The Commission is a one-member body designated to function as an autonomous authority responsible for regulation of the power sector in the State of Nagaland. The powers and the functions of the Commission are as prescribed in the Electricity Act, 2003. The head office of the Commission is presently located at Kohima, Nagaland.

The Nagaland Electricity Regulatory Commission for the State of Nagaland started to function with effect from 4<sup>th</sup> March, 2008 with the objectives and purposes for which the Commission has been established.

#### **1.1.1. In accordance with the provisions of the Act, the Nagaland Commission discharges the following functions:**

- (a) Determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case may be, within the State: Provided that where open access has been permitted to a category of consumers under Section 42, the State Commission shall determine only the wheeling charges and surcharge thereon, if any, for the said category of consumers;
- (b) Regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State;
- (c) Facilitate intra-State transmission and wheeling of electricity;
- (d) Issue licenses to persons seeking to act as transmission licensees, distribution licensees and electricity traders with respect to their operations within the State;

- (e) 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, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee;
- (f) Adjudicate upon the disputes between the licensees and generating companies; and to refer any dispute for arbitration;
- (g) Levy fee for the purposes of this Act;
- (h) Specify State Grid Code consistent with the Grid Code specified under Clause (h) of subsection (1) of Section 79;
- (i) Specify or enforce standards with respect to quality, continuity and reliability of service by licensees;
- (j) Fix the trading margin in the intra-State trading of electricity, if considered, necessary.
- (k) Discharge such other functions as may be assigned to it under the Act.

### **1.1.2. Tariff Petition:**

The Petitioner has filed a Petition before the Commission on 26-9-2023 for determination of levellised tariff for 100 MW Solar PV Power Project at Tizit, Mon District.

Further, the Petitioner submitted that the entire project shall be developed in phased manner. Accordingly, the Petitioner has prayed for the Generic Tariff of Rs. 4.59/kWh for 1<sup>st</sup> phase of 20 MW Solar PV Power Project upto 25 years.

### **1.2. Admission of Petition and Publication:**

The Commission, after receiving requisite additional information and clarifications from the Petitioner, admitted the petition on 24-11-2023 vide case No. 09/2023-24.

In accordance with section 64 of the Electricity Act, 2003 and to ensure public participation, the summary of the petition in the abridged form was published on 16-12-2023 in following local Newspapers inviting the stakeholders/public/Consumers to submit their objections and suggestions, if any, in writing or in person, to the Secretary NERC on the petition on or before 4<sup>th</sup> January, 2024.



<b>Sl. No.</b>	<b>Name of the Newspaper</b>	<b>Language</b>	<b>Date of Publication</b>
1	Nagaland Post	English	16-12-2023
2	The Morung Express	English	16-12-2023
3	Eastern Mirror	English	16-12-2023

No objection/suggestion was received by the Commission on the petition till the last date of submission.

### **1.3. Notice for Public Hearing:**

The Commission, through the above-mentioned Public Notice published on 12<sup>th</sup> Jan, 2024 invited the interested stakeholders, general public and consumers to the public hearing scheduled to be held on 24-01-2024 at NERC Conference Hall, Kohima on the said petition. However, the Hearing was adjourned due to non-appearance of designated representative (Technical & Commercial team) from the Firm as well as inadequate submission of information to the Commission before the Hearing. Subsequently, the final Hearing was conducted on 12<sup>th</sup> June, 2024 from 11:00am onwards at the NERC Conference Hall, Kohima. The detail minutes of the Public Hearing is given in Chapter-3.

## 2. SUMMARY OF TARIFF PETITION

### 2.1. Project Cost & Annual Fixed Charges

The Petitioner in its petition has proposed the project cost of the 20 MW Solar PV Power Project at Tizit, Mon District, Nagaland along with Annual Fixed Charges & levelled Tariff. The proposed project cost & Tariff are shown in Table below.

**Table 1: Project Cost projected by petitioner (Rs. in Lakhs)**

Sl. No.	Particulars	Project Cost for 20 MW
<b>A</b>	<b>DC side</b>	
1	PV MODULES (550 W <sub>p</sub> MONO PERC)	3,600.00
2	MMS Supply	700.00
3	Land Development cost	120.00
4	Design & Engineering	60.00
5	DC CABLES + CONNECTORS + SMBs-	100.00
6	MMS FOUNDATIONS + ERECTION & MOUNTING OF MODULES-( installation & Commissioning)	550.00
7	CIVIL WORKS & Fencing	330.00
8	CMC for 5 years	-
9	Transport	400.00
	<b>Total DC Side</b>	<b>5,860.00</b>
<b>B</b>	<b>AC side</b>	-
1	AC CABLES + TERMINATION KITS-	77.50
2	SURVEY + SOIL TESTING + LEVELLING+ BOREWELL + LA + ALL DRAWINGS + MODULE CLEANING SYSTEM-	31.00
3	INVERTERS + LT/CICO PANELS + UPS + SPARES + IDT	519.25
4	Liosoning Charges	15.50
5	MONITORING / SCADA + WEATHER STATION-	38.75
	<b>Total AC Side</b>	<b>682.00</b>
<b>C</b>	<b>Civil work</b>	-
1	Civil work for all Roads, Drainage	58.13
2	Civil Construction for Control room, washroom, car parking	31.00
3	MISC SERVICES - MATERIAL HANDLING + SITE EXPENSES + SECURITY + DIRECT TRAVEL COSTS	23.25

Sl. No.	Particulars	Project Cost for 20 MW
4	Interest cost 12 % for 12 months on working capital 15% of the project cost	204.60
	<b>Total Civil Work</b>	<b>316.98</b>
D	<b>Switchyard &amp; transmission line Cost</b>	-
1	TRANSFORMERS + MV/HT PANELS + SWITCHYARD ETC-	775.00
2	Transmission line Charge for 12 Kms.( 15LAKH/ KM)	232.50
	<b>Total Transmission Work</b>	<b>1,007.50</b>
E	<b>BD &amp; Company Cost</b>	-
1	Charges of heads @ 4%	310.00
2	PMC charges - TRPL	77.50
3	ROW charges	310.00
4	Admin cost for company (Employee, salary, all admin expenses)	224.75
	<b>Total BD &amp; Company Cost</b>	<b>922.25</b>
F	<b>Final Project Cost</b>	<b>8,788.73</b>
G	GST @ 13.08%	1,212.84
H	<b>TOTAL COST</b>	<b>10,001.57</b>

## 2.2. Prayers of Petition:

The Petitioner has prayed in its petition for the following:

- To admit and approve the Petition for the 20 MW Solar PV Power Plant at, Tizit, Nagaland.
- To approve the tariff submitted by petitioner.
- Condone any inadvertent delay/omissions/errors/rounding off differences/shortcoming and Petitioner may please be permitted to add/change/modify/alter the petition.
- Permit petitioner to file additional data/information as may be necessary.
- Pass such orders as the Commission may deem fit and proper, keeping in view the facts and circumstances of the case.

### **3. PUBLIC HEARING**

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#### **3.1. Public Hearing**

As envisaged in the Electricity Act, 2003 and also to ensure transparency in the process of determination of tariff, public hearing was held as scheduled on 12-06-2024 in the NERC Conference Hall, Kohima.

#### **3.2. Proceedings of Public Hearing**

The Public Hearing was chaired by the Chairman, Nagaland Electricity Regulatory Commission (NERC). He welcomed all the Members present and expressed his wishes for a good interaction and a fruitful discussion. To begin with the public hearing, summary of the petition was briefed by the petitioner followed by queries and replies. During the hearing, participants were given adequate opportunity to raise queries & comments if any, on the Petition filed by the project Petitioner. There were queries and replies on many points.

##### **Summary of DPR and Tariff Proposal for first phase 20 MWp:**

1. The firm proposes to set up an independent Solar power plant of 20 MW capacities to generate electricity in first phase.
2. Land cost (per MW per year lease) is ₹ 0.25 lakhs.
3. Evacuation of power generated from the proposed plant will be through the existing 66/33kv Transmission line from Tizit Sub-station.
4. The proposed generation of energy from the plant is 24.9 MU/year.
5. The proposed total Capital Cost is ₹ 100 Crs
6. The proposed generation tariff is levellised at ₹ 4.59/kWh.

Upon perusal of the Petition and the Detail Project Report (DPR) and on being satisfied, the Commission admitted the petitions and numbered as Case No.09/2023-24 dated 24/11/2023. The Commission conducted the hearing on 12-06-2024.

The following queries and replies were submitted during the Hearing by both the parties:

1. Query with regard to the Aims & Objectives of the Proposed Plant:

**Reply by the Firm:**

The main objective of the proposal is to set up a solar power plant in Nagaland purely under IPP mode which will not only help the State to reduce its dependencies on the Central Generating Stations but also to achieve its targeted RPO set by the Commission for the DPN. The proposed project shall also have the potential to qualify under the Environmental Credits/GHG emission reduction programs which include regulatory Clean Development Mechanism (CDM). Thus, resulting in long term benefit to the State Government for availing any grants/loan from the International Institutions like World Bank etc for other development activities.

2. DPN Official present highlighted that the electricity tariff in the country is getting very competitive and to further promote generation and consumption of Renewable Energy the Inter-state Transmission Charges for RE has been subsidized substantially by GoI. With this new development, the DPN is set to buy RE power from Solar-Wind Hybrid Power Plant developing by NHPC with a tariff of ₹2.59/kWh. Under this scenario, the said proposed Tariff @ ₹ 4.59/kWh becomes quite unreasonable and expensive for the State Power Department when the average power purchase cost (at source) of the DPN is around ₹ 4/kWh only.

Therefore, unless the approved tariff for the said plant is reasonable for the DPN, the State Government may not enter into an agreement to purchase the generated energy from the proposed plant.

**Reply by the Firm:**

The proposed Solar Power Plant is purely under Independent Power Producer (IPP) mode and so there is no external grants for the proposed project unlike other Central Generating Stations where the Ministry extend huge grants and the State Government develops dedicated Sub-stations near the site for power evacuations which results to substantial reduction in the total capital cost of the plant.

The proposed Tariff is computed based on the guidelines/Rules/Regulations issued by the CERC and based on the technical survey of the State. However, the proposed Tariff @ ₹ 4.59/kWh may appear to be slightly higher when compared to the other CGS in the country but since the plant is proposed to be set up within the state, it will not only have a massive impact on the socio-economic development of the state but also acts as a catalyst to flourish local industries and other business developments. The proposed plant will also generate direct and indirect employment opportunity for skilled and unskilled youths in the state.

3. Query with regard to the Capacity Utilization Factor (CUF):

**Reply by the Firm:**

The CUF has been computed at 12% as per the Solar Radiation data taken from the NASA's surface meteorology, Meteonorm and PV SYST Software simulation process for the project site. The study was carried with actual geographical coordinates of the proposed site and the movement of the sun all the year around.

4. Query with regard to the Auxiliary Consumption:

**Reply by the Firm:**

Auxiliary Consumption has been assumed to be 0.25% of CUF.

5. Query with regard to the Government incentives or grants for the project:

**Reply by the Firm:**

No grants/incentives provided for this project.

**Decision of the Commission:**

The Commission considered the submission advanced by the representatives of the M/s. Tvaksas Renewable Pvt. Ltd. as well as the submission of the DPN.

Taking into account the concern of both the parties, the Commission considered the prudent cost for the project developer and rationalised the tariff relating to existing average power purchase cost of the DPN and the energy market trends to balance with consumer interest.

Further, the Commission also advised the DPN to follow the Competitive Bidding route in near future as mandated by the State Power Policy 2018, doing away with the MOU route.

The participant who attended the Public Hearing is as listed here below:

1. Shri. Khose Sale, Chairman-cum-Member, NERC.
2. Er. Kasho Chishi, Chief Engineer, Department of Power, Nagaland.
3. Er. T. Lithrichum Sangtam, SE (Generation), Department of Power, Nagaland.
4. Er. Lhoubeizo Hesiye, Deputy Director, N&RE Department, Nagaland.
5. Er. Hekavi N Ayemi, Deputy Director, NERC, Kohima.
6. Mr. Shivito Wotsa, Sr. Accounts Officer, NERC, Kohima.
7. Er. Hsusinlo Tep, SDO (TC), Department of Power, Nagaland.
8. Ms. Bhakti Dave, Managing Director, M/s.Tvaksas Renewable Pvt. Ltd. Pune.
9. Ms. Nisha Poddar, Legal Advisor, M/s.Tvaksas Renewable Pvt. Ltd. Pune.
10. Mr. Moinul Hoque, representative of M/s.Tvaksas Renewable Pvt. Ltd. Pune.
11. Mr. Kulendu Kalita, representative of M/s.Tvaksas Renewable Pvt. Ltd. Pune.
12. Mr. Nokpai Wangsha, representative of M/s.Tvaksas Renewable Pvt. Ltd. Pune.

Sd/-  
**Er. HEKAVI N AYEMI**  
Deputy Director,  
NERC, Kohima.

## 4. PROJECT IMPLEMENTATION AND COST

### 4.1. Overview of the Project

The Petitioner submitted that the 1<sup>st</sup> phase of the 100 MW Solar PV Power project i.e. the capacity of 20 MW Solar PV Power Plant shall be located at Tizit, Mon District, Nagaland. The Petitioner submitted that the total 400-450 Acre land is available for installation of the said project.

The Petitioner further submitted that the entire project of 100 MW at this site will be able to generate 1249 MWh/ year with the approximate performance ratio of 78.1%.

Further, the Petitioner submitted that in the first phase of 20 MW Solar Power Plant will be able to generate 529 MUs during the total project life of 25 years by considering CUF of 12%.

### 4.2. Grid Connectivity (Power Evacuation)

#### Petitioner’s Submission:

The Petitioner submitted that the power will be evacuated at 33 KV level from 66/33/11 KV Tizit Sub-Station which is 12-15 Km away from the site.

### 4.3. Capital Cost Petitioner’s Submission:

4.3.1. The Petitioner submitted that the 20 MW Solar PV Power Plant shall be implemented through a turnkey engineering, procurement and construction (EPC) contract. The total project cost for the first phase of implementation of 20 MW is as follows:

**Table 2: Total Estimated Project Cost (Rs. in Lakhs)**

Sl. No.	Particulars	Project Cost for 20 MW
<b>A</b>	<b>DC Side</b>	
1	PV MODULES (550 W <sub>p</sub> MONO PERC)	3,600.00
2	MMS Supply	700.00
3	Land Development cost	120.00
4	Design & Engineering	60.00
5	DC CABLES + CONNECTORS + SMBs-	100.00
6	MMS FOUNDATIONS + ERECTION & MOUNTING OF MODULES-( installation & Commissioning)	550.00





#### 4.3.2. Means of Finance

The total estimated project cost for 20 MW solar power plant is Rs. 10,001.57 Lakhs. The Petitioner submitted that the total project shall be funded through the mixture of debt and equity at the Ratio of 70:30.

#### 4.3.3. Project Components & Assumptions

The following are the items estimated towards other costs.

- (a) **Solar PV Modules:** The Petitioner submitted that it will install the solar PV module having minimum declared output of 330-350-360 Wp or more for execution of the project. Further, it has estimated Rs. 3600 Lakhs for installation of the said solar PV Modules which is around 35.99% of the total project of 20 MW Power plant.
- (b) **Civil & Mounting Structure:** The Petitioner submitted that the structures will be made up of hot-dip galvanized/pre galvanized steel and design to withstand forces during normal conditions (viz. wind loads & dead loads, switchyard components) and abnormal conditions (viz. short circuit, earthquake etc.).
- (c) **Evacuation cost up to interconnection point (Cables & Transformers):** The Petitioner submitted that the power will be evacuated at the level of 33 KV voltage level from 66/33/11 KV Tizit Sub-Station, which is 12-15 Km away from the site. For this purpose adequate capacity Transformers shall be provided to step up the voltage to 3 Ph, 690 Volts, 50 Hz output of the PCUs to 33 KV and further 66 KV to 33 KV or 132 KV to 66 KV to be taken to Tizit substation.

#### 4.4. Commission's Analysis:

Regulation 46 of the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides that the Commission shall determine only project specific capital cost considering the prevailing market trends.

The Commission observed that in the previous Petition filed by the DNRE, the Capital Cost claimed was Rs. 500.08 Lakhs/MW. However, the Commission had only allowed the Capital cost of Rs. 500 Lakhs/MW for installation of 05 MW Solar Power Plant at Hovukhu, Nuiland.

**Therefore, the commission at this stage has considered the project cost of Rs. 500 Lakhs/ MW for development of this present 20MW Solar Power Project.**

The Petitioner is directed to submit audited actual capital cost to the Commission before commissioning of the project along with the impact of the same on the tariff.

#### 4.5. Debt Equity Ratio:

Provisions relating to the Debt Equity ratio for calculation for interest on loan & return on equity, as given in Regulation 13 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 has been considered for determination of Debt-Equity. The Regulation provides as follows:

- (1) *For determination of generic tariff and project specific tariff, the debt equity ratio shall be considered as 70:30.*
  - i. *The project specific tariffs, where the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as a normative loan;*
  - ii. *The project specific tariffs where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff;*
  - iii. *The equity invested in foreign currency shall be designated in Indian rupees on the date of each investment;*
  - iv. *The debt-equity ratio shall be considered after deducting the amount of grant or capital subsidy received for the project for arriving at the amount of debt and equity; and*
  - v. *The premium, if any, raised by the generating company while issuing share capital and investment of internal resources created out of its free reserve for the funding of the project shall be reckoned as paid-up capital for the purpose of computing return on equity only if such premium amount and internal resources are actually utilised for meeting the capital expenditure of the renewable energy project.*

**Based on above, the Debt & Equity has been considered in the ratio of 70:30 for the purpose of calculating Normative Loan base and Normative Equity base. Details of the same is as follows:**

**Table 3: Approved Means of Finance**

**(Rs. in Lakhs)**

<b>Total Project Cost</b>	<b>Normative Debt</b>	<b>Normative Equity</b>
10,000 Lakhs	7,000 Lakhs	3,000 Lakhs

**Accordingly, the Commission considered normative Debt & Equity as above for computation of RoE & Interest on Loan.**

## 5. Annual Fixed Charges

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### 5.1. Overview of Annual Fixed Charges:

The CERC Regulations provides for the components of AFC and various parameters as provided below:

- (a) Operation and Maintenance expenses;
- (b) Depreciation;
- (c) Interest on loan;
- (d) Interest on working capital;
- (e) Return on equity.

Each of the above components are analysed and discussed in the subsequent sections.

### 5.2. Operation and Maintenance Expenses:

The Petitioner has claimed O&M Expenses as Rs. 4 Lakhs/MW (4 Lakhs X 20 MW) for 1<sup>st</sup> Year of the Project Life. Further, the O&M expenses for the subsequent years has been claimed by escalating 1<sup>st</sup> year O&M expenses at the rate 4% year over year.

#### Commission's Analysis:

Regulation 19 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides as follows:

- (1) *Operation and Maintenance expenses shall be determined for the Tariff Period of the project based on normative O&M expenses specified in these regulations for the first year of the Control Period.*
- (2) *Normative O&M expenses allowed during the first year of the Control Period, i.e. financial year 2024-25, under these regulations, shall be escalated at the rate of 5.25% per annum for the Tariff Period.*

Further, Regulation 48 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides as follows:

*“The Commission shall determine only project specific O&M expenses considering the prevailing market trends.”*

It is observed that the CERC has revised the escalation rate for O&M Expenses for the first year of the control period of FY 2024-25.

Further, the Petitioner submitted the O&M expenses of Rs. 80 Lakhs for the first year of the project. However, the Petitioner has not provided any basis of estimating the same. It is observed that the total installed capacity of the project is 100 MW and the O&M expenses claimed by the Petitioner for its first phase of installation of 20 MW Solar power plant is on higher side. Further, the O&M expenses per MW after commissioning of the entire planned capacity 100 MW plant shall be substantially low than the current estimation of Rs. 80 Lakhs/MW projected based on 20 MW capacity.

Therefore, the Commission at this stage deems it fit to allow the O&M expenses at 50 Lakhs for the first year of the project. Further, the petitioner has claimed yearly escalation of O&M expenses at the rate of 4%. The Commission considered the escalation rate of 5.25% as provided in the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024. The details of claim and approve figures of O&M Expenses is provided as follows:

**Table 4: O&M Expenses (Rs. in Lakhs)**

Sl. No.	Particulars	Unit	Claimed	Approved
1	Total Installed Capacity	MW	20	20.00
2	Total Project Cost	Rs. Lakh	10,001.57	10,000.00
3	Annual O&M Expense	Lakh	80.00	50.00
4	Escalation Rate	%	4.00%	5.25%
5	<b>Total Normative O&amp;M Expenses (up to project life of 25 years)</b>	<b>Lakh</b>	<b>3,331.67</b>	<b>2,470.28</b>

### 5.3. Depreciation:

Regulation 15 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides as follows:

- (1) *The value base for the purpose of depreciation shall be the capital cost of the project admitted by the Commission. The salvage value of the project shall*

*be considered as 10%, and depreciation shall be allowed up to a maximum of 90% of the capital cost of the project:*

*Provided that no depreciation shall be allowed to the extent of grant or capital subsidy received for the project.*

- (2) *Depreciation rate of 4.67% per annum shall be considered for the first 15 years and the remaining depreciation shall be evenly spread during the remaining Useful Life of the project.*
- (3) *Depreciation shall be computed from the first year of commercial operation: Provided that, for determination of project specific tariff, in case of commercial operation of the project for part of the year, depreciation shall be computed on a pro rata basis.*

**The above provisions as given in the CERC RE Regulations, 2024 has been considered for determining the depreciation in this order. The details of depreciation as approve by the Commission is as follows:**

**Table 5: Depreciation**

**(Rs. in Lakhs)**

<b>Name of the Project</b>	<b>Date of COD (assumed)</b>	<b>Capital Cost (Rs. Lakh) (Approved)</b>	<b>Total useful Life (Years)</b>	<b>Depreciation per year upto 15th Year</b>	<b>Depreciation per year after 15th year onwards</b>
20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland	10 Months from the date of sanction	10,000.00	25	467.00	199.50

#### **5.4. Interest on Loan Capital:**

The petitioner has submitted the rate of interest as 10.89% p.a. on reducing balance and tenure of loan as 15 years.

Regulation 14 (1) of The Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides that,

*“For determination of generic tariff and project specific tariff, loan tenure of 15 years shall be considered.”*

Further, Regulation 14 (2) of the CERC (Renewable Energy) Regulation, 2024 provides that:

“(2)Interest on Loan

- (a) The loans arrived at in the manner indicated in Regulation 13 shall be considered as gross normative loans for the calculation of interest on loans. For project specific tariff, the normative loan outstanding as on the 1st of April of every year shall be worked out by deducting the cumulative repayment up to the 31st of March of the previous year from the gross normative loan.
- (b) For the purpose of computation of tariff, the normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months shall be considered.
- (c) Notwithstanding any moratorium period availed by the project developer, the repayment of the loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.”

Based on above Regulations, the Commission has considered the State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) as applicable during last 06 months of FY 2023-24 for computation of Rate of Interest on Normative Loan. The details computation of Rate of Interest is as follows:

**Table 6: Rate of Interest on Normative Loan (Rs. in Lakhs)**

From Date	To Date	Base Rate	Period	Amount
01-10-2023	14-10-2023	8.55	14	119.70
15-10-2023	14-11-2023	8.55	31	265.05
15-11-2023	14-12-2023	8.55	30	256.50
15-12-2023	14-01-2024	8.65	31	268.15
15-01-2024	14-02-2024	8.65	31	268.15
15-02-2024	14-03-2024	8.65	29	250.85
15-03-2024	31-03-2024	8.65	17	147.05
			<b>183</b>	<b>1,575.45</b>
<b>Interest Rate (as per norms)</b>				<b>8.61</b>
<b>Add 200 Basis points = 2%</b>				<b>2.00</b>
<b>Rate of Interest on Normative Loan</b>				<b>10.61%</b>

Accordingly, the Commission has considered the rate of interest on loan as 10.61%.

Based on above and further approved Normative Loan base, the Commission has computed the Interest on Loan for determination of Tariff for 20 MW Solar PV Power Plant. The Details of the same with the claim of the Petitioner is as follows:



**Table 7: Interest on Normative Loan**

**(Rs. in Lakhs)**

Particulars	Unit	Claimed	Approved
Total Project Cost	Rs. Lakhs	10,001.57	10,000.00
Total Normative Loan Considered	%	70%	70%
Total Normative Loan Considered	Rs. Lakhs	7,001.10	7,000.00
Rate of Interest	%	10.89%	10.61%
<b>Total Interest on Normative Loan</b>	<b>Rs. Lakhs</b>	<b>4576.84</b>	<b>5,566.02</b>

### 5.5. Interest on Working Capital:

Regulation 17 (1) of The Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides as follows:

*“(1) The Working Capital requirement in respect of wind power projects, small hydro projects, solar PV power projects, floating solar projects, solar thermal power projects, municipal solid waste based power projects and refuse derived fuel based power projects and renewable energy with storage projects shall be computed in accordance with the following:*

- a) Operation and Maintenance expenses for one month;*
- b) Receivables equivalent to 45 days of tariff for the sale of electricity calculated on the normative Capacity Utilisation Factor or Plant Load Factor, as the case may be; and*
- c) Maintenance spares equivalent to 15% of Operation and Maintenance expenses.”*

Regulation 17 (4) of The Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides for the rate to be considered for interest on working capital. The provisions are reproduced below:

*“(4) Interest on Working Capital shall be at an interest rate equivalent to the normative interest rate of three hundred and twenty-five (325) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months.”*

The above regulation provides that the normative interest rate shall be 3.25% above the State Bank of India Marginal Cost of Funds based Lending Rate

(MCLR) (one-year tenor) prevalent during the last available six months. The six months average of the State Bank of India MCLR (One Year Tenure) is 8.61%, accordingly, allowable rate of interest on working capital is 11.86% (8.61%+3.25%).

**Based on above the details of approved Interest on Working Capital along with claimed figures is as follows:**

**Table 8: Interest on Working Capital (Rs. in Lakhs)**

Particulars	Unit	Claimed	Approved
Total Interest on Working Capital	Rs. Lakhs	-	4,480.32
Rate of Interest	%	0.00%	11.86%
<b>Interest on Working Capital</b>	<b>Rs. Lakhs</b>	<b>-</b>	<b>531.32</b>

### 5.6. Return on Equity:

Regulation 16 of The Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides for the Return on Equity. The provisions are reproduced below:

- “(1) *The value base for equity shall be as determined under Regulation 13.*
- (2) *The normative Return on Equity for renewable energy projects other than small hydro projects shall be 14%, and that for the small hydro projects shall be 15%. The normative Return on Equity shall be grossed up by the latest available notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the latest available notified Corporate Tax rate for the remaining Tariff Period.”*

**It is observed that the Petitioner has not submitted any regulatory provisions justifying the basis/methodology for the computation of the Return on Equity.**

**However, the Commission has approved the return on Equity in line with the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024.**

**The details of Return on Equity as approved by the Commission along with claimed figures is as follows:**

**Table 9: Return on Equity**

**(Rs. in Lakhs)**

<b>Sl. No.</b>	<b>Particulars</b>	<b>Unit</b>	<b>Claimed</b>	<b>Approved</b>
1	Total Project Cost	Rs. Lakhs	10,001.57	10,000.00
2	Total Equity Considered	%	30%	30%
3	Total Equity Considered	Rs. Lakhs	3,000.47	3,000.00
4	Rate of Return on Equity	%	45.78%	14.00%
5	Rate of RoE Grossed up with MAT Rate	%		16.45%
6	Rate of RoE grossed up with Corporate Tax Rate	%		18.67%
<b>7</b>	<b>Total RoE</b>	<b>Rs. Lakhs</b>	<b>34,338.75</b>	<b>12,668.46</b>

## 6. Designed Energy

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### 6.1. Calculation of CUF/PLF:

Regulation 18 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides as follows:

*“The number of hours in a year for calculation of Capacity utilization factor and plant load factor, as the case may be, shall be considered as 8766.”*

Further, Regulations 47 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides for the CUF. The provisions are reproduced below:

*“The Commission shall only approve capacity utilisation factors for project specific tariffs:*

*Provided that the minimum capacity utilization factor for solar PV power projects shall be 21%:”*

**Further, Regulation 61, of the Nagaland Electricity Regulatory Commission (Terms and Conditions for Determination of Generation Tariff for Renewable Energy) Regulations, 2011 provides as follows:**

*“61. Capacity Utilization Factor The capacity utilization factor (CUF) shall depend on insulation level which varies from State to State also various locations. Clear sunny days of around 290 days to 320 days are available in most parts of the country. The mean monthly global solar radiation incident over India is found to be of the order 5.5 to 6 KWh / Sq m / day.*

*Considering the data for clear sunny days and solar radiation incident the capacity utilization factor in Nagaland is observed as 20%.*

*The Commission has specified the CUF of 19 % to 21% as benchmark CUF for Solar PV based power projects.”*

**It is observed that the Petitioner has submitted CUF of the plant of 12%. In view of the topographical position and available data for clear sunny days and solar radiation within the state of Nagaland, the Commission deems it fit to allow the CUF of 20% for the 20 MW Solar power project.**

Further, the Petitioner has submitted the auxiliary consumption at 0.25%.

Regulation 49 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides for the Auxiliary Consumption. The provisions are reproduced below:

*“The Commission shall only approve auxiliary consumption for project specific tariff:*

*Provides that the maximum auxiliary consumption for solar PV power projects shall be 0.75%.”*

**In view of the claim of the Petitioner, the Commission considered the auxiliary consumption at 0.25% for computation of Net saleable Energy.**

## **6.2. Useful Life of the Project:**

Regulations 2(hh)(vi) of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2024 provides for the useful life of the generating station. The provisions are reproduced below:

*“„Useful Life in relation to project, including dedicated evacuation system, from the date of commercial operation of such project, shall mean the following: -*

*vi. Solar PV power project/floating solar project/*

*Solar thermal power project ..... 25 years”*

**In view of the above, useful life of the plant for determination of Tariff has been considered as 25 years.**

## **6.3. Tariff Design**

Regulations 10 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020 provides for the tariff on levelled basis for the Tariff period. The provisions are reproduced below:

- (1) *The generic tariff shall be determined, on a levelized basis, considering the year of commissioning of the project, for the tariff period of the project:  
Provided that for renewable energy projects having a single part tariff with two components, the fixed cost component shall be determined on a levelized basis considering the year of commissioning of the project while*

*the fuel cost component shall be determined on a year of operation basis in the Tariff Order to be issued by the Commission.*

- (2) *For the purpose of levelized tariff computation, a discount factor equivalent to the post-tax weighted average cost of capital shall be considered.*
- (3) *The above principles shall also apply for project specific tariffs."*

**The above provisions have been considered for determining the levelled tariff for the useful life of the project. Further, the discount factor for the purpose of levelled tariff computation has been considered at post-tax weighted average cost of capital of 11.06%.**

#### **6.4. Annual Fixed Charges & Tariff:**

Based on the parameters approved above, the Annual Fixed Charges (AFC) & levelled Tariff for the 20 MW Solar PV Power Plant has been determined. The details of Annual Fixed Charges & levelled Tariff for the project life of 25 year is provided in the Tables below.

**Table 10: Annual Fixed Charges (Rs. in Lakhs)**

YEAR	Annual Fixed Charges (Rs. in Lakh)					
	O&M Expense	Return on Equity	Interest on Loan	Depreciation	Interest on Working Capital	Total
<b>2024-25 ( 1st Year)</b>	50.00	493.37	717.86	467.00	27.05	<b>1,755.28</b>
<b>2nd Year</b>	52.63	493.37	668.31	467.00	26.42	<b>1,707.74</b>
<b>3rd Year</b>	55.39	493.37	618.77	467.00	25.81	<b>1,660.34</b>
<b>4th Year</b>	58.30	493.37	569.23	467.00	25.20	<b>1,613.09</b>
<b>5th Year</b>	61.36	493.37	519.68	467.00	24.59	<b>1,566.01</b>
<b>6th Year</b>	64.58	493.37	470.14	467.00	24.00	<b>1,519.09</b>
<b>7th Year</b>	67.97	493.37	420.59	467.00	23.41	<b>1,472.34</b>
<b>8th Year</b>	71.54	493.37	371.05	467.00	22.83	<b>1,425.79</b>
<b>9th Year</b>	75.29	493.37	321.51	467.00	22.25	<b>1,379.42</b>
<b>10th Year</b>	79.24	493.37	271.96	467.00	21.69	<b>1,333.27</b>
<b>11th Year</b>	83.40	493.37	222.42	467.00	21.13	<b>1,287.33</b>
<b>12th Year</b>	87.78	493.37	172.87	467.00	20.58	<b>1,241.61</b>
<b>13th Year</b>	92.39	493.37	123.33	467.00	20.05	<b>1,196.14</b>
<b>14th Year</b>	97.24	493.37	73.79	467.00	19.52	<b>1,150.92</b>
<b>15th Year</b>	102.35	493.37	24.51	467.00	19.01	<b>1,106.23</b>
<b>16th Year</b>	107.72	493.37	-	199.50	14.90	<b>815.50</b>
<b>17th Year</b>	113.38	493.37	-	199.50	15.15	<b>821.40</b>

YEAR	Annual Fixed Charges (Rs. in Lakh)					
	O&M Expense	Return on Equity	Interest on Loan	Depreciation	Interest on Working Capital	Total
18th Year	119.33	493.37	-	199.50	15.40	827.61
19th Year	125.59	493.37	-	199.50	15.67	834.14
20th Year	132.19	493.37	-	199.50	15.95	841.02
21st Year	139.13	560.20	-	199.50	17.24	916.07
22nd Year	146.43	560.20	-	199.50	17.56	923.68
23rd Year	154.12	560.20	-	199.50	17.89	931.70
24th Year	162.21	560.20	-	199.50	18.23	940.14
25th Year	170.73	560.20	-	199.50	18.60	949.02

Based on the approved AFC and considering the net saleable energy, the Commission approves the levelized Tariff for the project life of 25 year as below:

Table 11: Calculation of Net Generation

(in MUs)

Year	Installed Capacity	Capacity Utilization Factor	Gross Generation	Auxiliary Consumption	Net Generation
	MW	%	Kwh	Kwh	MU
Each Year of the Project Life	20	20%	35.064	0.25%	34.97634

Table 12: Approved Levelled Tariff

(in Rs.)

Particulars	Claimed	Approved Tariff
Total of Discounted Tariff	-	35.27
Total of Discounting Factor	-	8.56
Levelled tariff - 25 years - Rs./unit	4.59	4.12

Based on above, the Commission hereby approves the levelled Tariff for 20 MW Solar PV Power Plant at Tizit, Nagaland as ₹ 4.12 for 25 Years of the Project Life.

**By Order of the Commission.**

**Place:** Kohima.

**Dated:** the 19<sup>th</sup> August, 2024.

*Sd/-*  
**Deputy Director,**  
Nagaland Electricity Regulatory  
Commission, Kohima



## **7. DIRECTIVES**

**1. Actual Capital Expenditure:**

The petitioner is directed to work out the Actual Capital Expenditure incurred up to the Date of Commercial Operation of the Generating Station.

**2. Filing of Final Tariff Petition:**

The Commission directs the petitioner to file the petition along with the Actual Capital Cost duly Audited and Certified by the Statutory Authority from the date of Commercial Operation as prescribed under MYT Regulation for determination of the Final Tariff.

**3. Fixed Asset Register:**

The Commission directs the petitioner to maintain Fixed Asset Register at their end and submit to the Commission on yearly basis from the date of Commercial Operation of the plant.

**4. Status and Compliance Report:**

The Project developer is directed to submit the Status and Compliance Report of the above Directives to the Commission every 3 months from the date of issue of this Order.

**5. Penalty:**

Penalty for non-compliance of the directives of the Commission shall be dealt with as per relevant Section of the Indian Electricity Act, 2003.

**ANNEXURE**  
**Calculation of Full Cost Levellised Tariff**

<b>Nagaland Electricity Regulatory Commission</b>				
<b>Tariff Order for Renewable Energy</b>				
<b>20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland</b>				
<b>Sl. No.</b>	<b>Particulars</b>	<b>Unit</b>	<b>Claimed</b>	<b>Approved</b>
1	Total Installed Capacity	MW	20	20
2	Capital Cost	Rs. Lakh/MW	500.08	500.00
3	Total Capital Cost	Rs. Lakh	10,001.57	10,000.00
4	Govt. Subsidy (If any)	Rs. Lakh	-	-
5	<b>Net Capital Cost</b>	<b>Rs. Lakh</b>	<b>10,001.57</b>	<b>10,000.00</b>

**Nagaland Electricity Regulatory Commission**  
**Tariff Order for Renewable Energy**  
**20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland**

Name of the Project	Date of COD (assumed)	Capital Cost (Rs. Lakh) (Approved)	Total useful Life (Years)	Depreciation per year upto 15th Year	Depreciation per year after 15th year onwards
20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland	10 Months from the date of sanction	10,000.00	25	467.00	199.50

Sl. No.	Particulars	Approved
1	Capital Cost (Rs. Lakh)	10,000.00
2	Rate of Depreciation (%)	4.67%
3	Depreciation per year upto 15 Years	467.00
4	Total Depreciation upto 15 Year	7,005.00
5	Depreciable Value (%)	90%
6	Net Depreciable Value (Rs. Lakh)	9,000.00
7	Remaining Amount for Depreciation	1,995.00
8	Total useful life	25
9	Remaining useful life	10
10	Depreciation per year after 15th year onwards	199.50

**Nagaland Electricity Regulatory Commission**  
**Tariff Order for Renewable Energy**  
**20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland**

Sl. No.	Particulars	Unit	Claimed	Approved
1	Total Installed Capacity	MW	20.00	20.00
2	Total Project Cost	Rs. Lakh	10,001.57	10,000.00
3	Annual O&M Expense	Lakh	80.00	50.00
4	Escalation Rate	%	4.00%	5.25%
5	<b>Total Normative O&amp;M Expenses (up to project life of 25 years)</b>	<b>Lakh</b>	<b>3,331.67</b>	<b>2,470.28</b>

Year	Claimed	Approved
1st Year	80.00	50.00
2nd Year	83.20	52.63
3rd Year	86.53	55.39
4th Year	89.99	58.30
5th Year	93.59	61.36
6th Year	97.33	64.58
7th Year	101.23	67.97
8th Year	105.27	71.54
9th Year	109.49	75.29
10th Year	113.86	79.24
11th Year	118.42	83.40
12th Year	123.16	87.78
13th Year	128.08	92.39
14th Year	133.21	97.24
15th Year	138.53	102.35
16th Year	144.08	107.72
17th Year	149.84	113.38
18th Year	155.83	119.33
19th Year	162.07	125.59
20th Year	168.55	132.19
21st Year	175.29	139.13
22nd Year	182.30	146.43
23rd Year	189.59	154.12
24th Year	197.18	162.21
25th Year	205.06	170.73

**Nagaland Electricity Regulatory Commission**  
**Tariff Order for Renewable Energy**  
**20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland**

Sl. No.	Particulars	Unit	Claimed	Approved
1	Total Project Cost	Rs. Lakhs	10,001.57	10,000.00
2	Total Equity Considered	%	30%	30%
3	Total Equity Considered	Rs. Lakhs	3,000.47	3,000.00
4	Rate of Return on Equity	%	45.78%	14.00%
5	Rate of RoE Grossed up with MAT Rate	%		16.45%
6	Rate of RoE grossed up with Corporate Tax Rate	%		18.67%
7	<b>Total RoE</b>	<b>Rs. Lakhs</b>	<b>34,338.75</b>	<b>12,668.46</b>

RoE	MAT	CORPORATE RATE	Average RoE
Base rate	14%	14%	
Tax Rate	17.47%	33.38%	20.65%
Grossed up	<b>16.45%</b>	<b>18.67%</b>	16.89%

The normative Return on Equity shall be 14%. The normative Return on Equity shall be grossed up by the latest available notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the latest available notified Corporate Tax rate for the remaining Tariff Period.

	<b>Claimed</b>	<b>Approved</b>
1st Year	926.05	493.37
2nd Year	963.11	493.37
3rd Year	1006.25	493.37
4th Year	1056.16	493.37
5th Year	1113.61	493.37
6th Year	1179.46	493.37
7th Year	1254.69	493.37
8th Year	1340.36	493.37
9th Year	1638.87	493.37
10th Year	1622.10	493.37
11th Year	1605.23	493.37
12th Year	1588.27	493.37
13th Year	1571.20	493.37
14th Year	1554.03	493.37
15th Year	1536.73	493.37
16th Year	1519.30	493.37
17th Year	1501.73	493.37
18th Year	1484.02	493.37
19th Year	1466.15	493.37
20th Year	1448.11	493.37
21st Year	1429.89	560.20
22nd Year	1411.48	560.20
23rd Year	1392.88	560.20
24th Year	1374.06	560.20
25th Year	1355.01	560.20

**Nagaland Electricity Regulatory Commission**  
**Tariff Order for Renewable Energy**  
**20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland**

<b>Particulars</b>	<b>Unit</b>	<b>Claimed</b>	<b>Approved</b>
Total Project Cost	Rs. Lakhs	10,001.57	10,000.00
Total Normative Loan Considered	%	70%	70%
Total Normative Loan Considered	Rs. Lakhs	7,001.10	7,000.00
Rate of Interest Considered	%	10.89%	10.61%
<b>Total Interest on Normative Loan</b>	<b>Rs. Lakhs</b>	<b>4576.84</b>	<b>5,566.02</b>

(b) For the purpose of computation of tariff, normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months has been considered.



Year	Opening balance	Repayment	Closing Balance	Average Loan	Rate of Interest	Interest
1st Year	7,000.00	467.00	6,533.00	6,766.50	10.61%	717.86
2nd Year	6533.00	467.00	6,066.00	6,299.50	10.61%	668.31
3rd Year	6066.00	467.00	5,599.00	5,832.50	10.61%	618.77
4th Year	5599.00	467.00	5,132.00	5,365.50	10.61%	569.23
5th Year	5132.00	467.00	4,665.00	4,898.50	10.61%	519.68
6th Year	4665.00	467.00	4,198.00	4,431.50	10.61%	470.14
7th Year	4198.00	467.00	3,731.00	3,964.50	10.61%	420.59
8th Year	3731.00	467.00	3,264.00	3,497.50	10.61%	371.05
9th Year	3264.00	467.00	2,797.00	3,030.50	10.61%	321.51
10th Year	2797.00	467.00	2,330.00	2,563.50	10.61%	271.96
11th Year	2330.00	467.00	1,863.00	2,096.50	10.61%	222.42
12th Year	1863.00	467.00	1,396.00	1,629.50	10.61%	172.87
13th Year	1396.00	467.00	929.00	1,162.50	10.61%	123.33
14th Year	929.00	467.00	462.00	695.50	10.61%	73.79
15th Year	462.00	462.00	-	231.00	10.61%	24.51
16th Year	-	-	-	-	10.61%	-
17th Year	-	-	-	-	10.61%	-
18th Year	-	-	-	-	10.61%	-
19th Year	-	-	-	-	10.61%	-
20th Year	-	-	-	-	10.61%	-
21st Year	-	-	-	-	10.61%	-
22nd Year	-	-	-	-	10.61%	-
23rd Year	-	-	-	-	10.61%	-
24th Year	-	-	-	-	10.61%	-
25th Year	-	-	-	-	10.61%	-

From Date	To Date	Base Rate	Period	Amount
01-10-2023	14-10-2023	8.55	14	119.70
15-10-2023	14-11-2023	8.55	31	265.05
15-11-2023	14-12-2023	8.55	30	256.50
15-12-2023	14-01-2024	8.65	31	268.15
15-01-2024	14-02-2024	8.65	31	268.15
15-02-2024	14-03-2024	8.65	29	250.85
15-03-2024	31-03-2024	8.65	17	147.05
			<b>183</b>	<b>1,575.45</b>
<b>Interest Rate (as per norms)</b>			<b>8.61</b>	
<b>Add 200 Basis points = 2%</b>			<b>2.00</b>	
<b>Rate of Interest on Normative Loan</b>			<b>10.61%</b>	

**Nagaland Electricity Regulatory Commission**  
**Tariff Order for Renewable Energy**  
**20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland**

<b>Particulars</b>	<b>Unit</b>	<b>Claimed</b>	<b>Approved</b>
Total Interest on Working Capital	Rs. Lakhs	-	4,301.52
Rate of Interest	%	0.00%	11.86%
<b>Interest on Working Capital</b>	<b>Rs. Lakhs</b>	<b>-</b>	<b>510.12</b>

Year	Operation & Maintenance Exp.	Receivables	Maintenance Spares -	Total Working Capital Requirement	Rate of Interest	Interest on Working Capital
	1 Month	45 Days	15% of O&M Exp.			
1st Year	4.17	216.40	7.50	228.07	11.86%	27.05
2nd Year	4.39	210.54	7.89	222.82	11.86%	26.42
3rd Year	4.62	204.70	8.31	217.62	11.86%	25.81
4th Year	4.86	198.87	8.74	212.48	11.86%	25.20
5th Year	5.11	193.07	9.20	207.39	11.86%	24.59
6th Year	5.38	187.28	9.69	202.35	11.86%	24.00
7th Year	5.66	181.52	10.20	197.38	11.86%	23.41
8th Year	5.96	175.78	10.73	192.47	11.86%	22.83
9th Year	6.27	170.07	11.29	187.63	11.86%	22.25
10th Year	6.60	164.38	11.89	182.87	11.86%	21.69
11th Year	6.95	158.71	12.51	178.17	11.86%	21.13
12th Year	7.32	153.08	13.17	173.56	11.86%	20.58
13th Year	7.70	147.47	13.86	169.03	11.86%	20.05
14th Year	8.10	141.89	14.59	164.58	11.86%	19.52
15th Year	8.53	136.39	15.35	160.27	11.86%	19.01
16th Year	8.98	100.54	16.16	125.68	11.86%	14.90
17th Year	9.45	101.27	17.01	127.72	11.86%	15.15
18th Year	9.94	102.03	17.90	129.88	11.86%	15.40
19th Year	10.47	102.84	18.84	132.14	11.86%	15.67
20th Year	11.02	103.69	19.83	134.53	11.86%	15.95
21st Year	11.59	112.94	20.87	145.40	11.86%	17.24
22nd Year	12.20	113.88	21.96	148.05	11.86%	17.56
23rd Year	12.84	114.87	23.12	150.83	11.86%	17.89
24th Year	13.52	115.91	24.33	153.76	11.86%	18.23
25th Year	14.23	117.00	25.61	156.84	11.86%	18.60

<b>From Date</b>	<b>To Date</b>	<b>Base Rate</b>	<b>Period</b>	<b>Amount</b>
01-10-2023	14-10-2023	8.55	14	119.70
15-10-2023	14-11-2023	8.55	31	265.05
15-11-2023	14-12-2023	8.55	30	256.50
15-12-2023	14-01-2024	8.65	31	268.15
15-01-2024	14-02-2024	8.65	31	268.15
15-02-2024	14-03-2024	8.65	29	250.85
15-03-2024	31-03-2024	8.65	17	147.05
			183	1,575.45
<b>Interest Rate (as per norms)</b>			<b>8.61</b>	
<b>Add 350 Basis points = 3.25%</b>			<b>3.25</b>	
<b>Rate of Interest on Normative Loan</b>			<b>11.86%</b>	

**Nagaland Electricity Regulatory Commission  
Tariff Order for Renewable Energy  
20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland**

YEAR	Annual Fixed Charges (Rs. in Lakh)							Total
	O&M Expense	Return on Equity	Interest on Loan	Depreciation	Interest on Working Capital			
2024-25 (1st Year)	50.00	493.37	717.86	467.00	27.05		1,755.28	
2nd Year	52.63	493.37	668.31	467.00	26.42		1,707.74	
3rd Year	55.39	493.37	618.77	467.00	25.81		1,660.34	
4th Year	58.30	493.37	569.23	467.00	25.20		1,613.09	
5th Year	61.36	493.37	519.68	467.00	24.59		1,566.01	
6th Year	64.58	493.37	470.14	467.00	24.00		1,519.09	
7th Year	67.97	493.37	420.59	467.00	23.41		1,472.34	
8th Year	71.54	493.37	371.05	467.00	22.83		1,425.79	
9th Year	75.29	493.37	321.51	467.00	22.25		1,379.42	
10th Year	79.24	493.37	271.96	467.00	21.69		1,333.27	
11th Year	83.40	493.37	222.42	467.00	21.13		1,287.33	
12th Year	87.78	493.37	172.87	467.00	20.58		1,241.61	
13th Year	92.39	493.37	123.33	467.00	20.05		1,196.14	
14th Year	97.24	493.37	73.79	467.00	19.52		1,150.92	
15th Year	102.35	493.37	24.51	467.00	19.01		1,106.23	
16th Year	107.72	493.37	-	199.50	14.90		815.50	
17th Year	113.38	493.37	-	199.50	15.15		821.40	
18th Year	119.33	493.37	-	199.50	15.40		827.61	
19th Year	125.59	493.37	-	199.50	15.67		834.14	
20th Year	132.19	493.37	-	199.50	15.95		841.02	
21st Year	139.13	560.20	-	199.50	17.24		916.07	
22nd Year	146.43	560.20	-	199.50	17.56		923.68	
23rd Year	154.12	560.20	-	199.50	17.89		931.70	
24th Year	162.21	560.20	-	199.50	18.23		940.14	
25th Year	170.73	560.20	-	199.50	18.60		949.02	

**Nagaland Electricity Regulatory Commission**  
**Tariff Order for Renewable Energy**  
**20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland**

Year	Installed Capacity MW	Capacity Utilization Factor %	Gross Generation Kwh	Auxiliary Consumption Kwh	Net Generation MU	Net Generation Claimed MU
1st Year	20	20%	35.064	0.25%	34.97634	22.98
2nd Year	20	20%	35.064	0.25%	34.97634	22.98
3rd Year	20	20%	35.064	0.25%	34.97634	22.98
4th Year	20	20%	35.064	0.25%	34.97634	22.98
5th Year	20	20%	35.064	0.25%	34.97634	22.98
6th Year	20	20%	35.064	0.25%	34.97634	22.98
7th Year	20	20%	35.064	0.25%	34.97634	22.98
8th Year	20	20%	35.064	0.25%	34.97634	22.98
9th Year	20	20%	35.064	0.25%	34.97634	22.98
10th Year	20	20%	35.064	0.25%	34.97634	22.98
11th Year	20	20%	35.064	0.25%	34.97634	22.98
12th Year	20	20%	35.064	0.25%	34.97634	22.98
13th Year	20	20%	35.064	0.25%	34.97634	22.98
14th Year	20	20%	35.064	0.25%	34.97634	22.98
15th Year	20	20%	35.064	0.25%	34.97634	22.98
16th Year	20	20%	35.064	0.25%	34.97634	22.98
17th Year	20	20%	35.064	0.25%	34.97634	22.98
18th Year	20	20%	35.064	0.25%	34.97634	22.98
19th Year	20	20%	35.064	0.25%	34.97634	22.98
20th Year	20	20%	35.064	0.25%	34.97634	22.98
21st Year	20	20%	35.064	0.25%	34.97634	22.98
22nd Year	20	20%	35.064	0.25%	34.97634	22.98
23rd Year	20	20%	35.064	0.25%	34.97634	22.98
24th Year	20	20%	35.064	0.25%	34.97634	22.98
25th Year	20	20%	35.064	0.25%	34.97634	22.98

Particulars	ARR (Rs. in Lakhs)	Net Generation (In Mus)	Tariff (Rs.)	Discounting Factor		Discounted Tariff (Rs.)
1st Year	1,755.28	34.98	5.02	11.06%	1.00	5.02
2nd Year	1,707.74	34.98	4.88	11.06%	0.89	4.34
3rd Year	1,660.34	34.98	4.75	11.06%	0.79	3.75
4th Year	1,613.09	34.98	4.61	11.06%	0.70	3.24
5th Year	1,566.01	34.98	4.48	11.06%	0.63	2.80
6th Year	1,519.09	34.98	4.34	11.06%	0.56	2.42
7th Year	1,472.34	34.98	4.21	11.06%	0.49	2.08
8th Year	1,425.79	34.98	4.08	11.06%	0.44	1.79
9th Year	1,379.42	34.98	3.94	11.06%	0.39	1.54
10th Year	1,333.27	34.98	3.81	11.06%	0.35	1.33
11th Year	1,287.33	34.98	3.68	11.06%	0.31	1.14
12th Year	1,241.61	34.98	3.55	11.06%	0.28	0.98
13th Year	1,196.14	34.98	3.42	11.06%	0.24	0.84
14th Year	1,150.92	34.98	3.29	11.06%	0.22	0.72
15th Year	1,106.23	34.98	3.16	11.06%	0.19	0.61
16th Year	815.50	34.98	2.33	11.06%	0.17	0.40
17th Year	821.40	34.98	2.35	11.06%	0.15	0.36
18th Year	827.61	34.98	2.37	11.06%	0.14	0.32
19th Year	834.14	34.98	2.38	11.06%	0.12	0.29
20th Year	841.02	34.98	2.40	11.06%	0.11	0.26
21st Year	916.07	34.98	2.62	11.06%	0.10	0.25
22nd Year	923.68	34.98	2.64	11.06%	0.09	0.23
23rd Year	931.70	34.98	2.66	11.06%	0.08	0.20
24th Year	940.14	34.98	2.69	11.06%	0.07	0.18
25th Year	949.02	34.98	2.71	11.06%	0.06	0.16

**Nagaland Electricity Regulatory Commission  
Tariff Order for Renewable Energy  
20 MW Solar Power PV Plant, Tizit, Dist: Mon, Nagaland**

Particulars	Claimed	Approved Tariff
Total of Discounted Tariff		35.27
Total of Discounting Factor		8.56
Levelling tariff - 25 years - Rs./unit	4.59	4.12

Total Revenue	24,291.24	30,214.87
Total Generation	529.03	874.41
Average Tariff	4.59	3.46

Particulars	Amount/Rate	
capital cost		10000.00
Debt	70%	7000.00
Equity	30%	3000.00
Interest rate		10.61%
RoE		16.45%
Tax Rate		17.47%
Capital - Loan		6.13%
Capital Cost - Equity		4.93%
WACC		<b>11.06%</b>





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