NAGALAND ELECTRICITY REGULATORY COMMISSION

TARIFF ORDER

22.5 MW Small Hydro Power Project
on Yijun River Hak Chang , Tuensang District

Dated: 20th February, 2017

341 Upper Agri Colony, Kohima - 797001, Nagaland
Phone/Fax: (0370) 2241592 (O)
E-mail: nerc_kohima@yahoo.com / Website: www.nerc.org.in

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ABBREVIATIONS

Abbreviation	Description
ARR	Aggregate Revenue Requirement
CERC	Central Electricity Regulatory Commission
CoS	Cost of Supply
CPSU	Central Power Sector Undertakings
Cr	Crores
CWIP	Capital Work in Progress
DE	Debt Equity
ER	Eastern Region
FY	Financial Year
GFA	Gross Fixed Assets
HT	High Tension
KV	Kilovolt
KW	Kilo Watt
kWh	kilo Watt hour
LT	Low Tension
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
₹	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. : 02/2017.

In the matter of

Determination of Generation Tariff on Petition filed by M/s. Harit Dynamics Pvt Ltd.
-Petitioner.

Present

Er. IMLIKUMZUK AO
Chairman-cum-Member,
NERC, Kohima.

ORDER

(The 20th December, 2017)

1. M/s. Harit Dynamics Pvt Ltd in association with M/s Eleutheros Christian Society, Nagaland (herein after referred to Project Developer/Petitioner) proposes to develop 22.5 MW small hydro power project in Yijung River at Hak Chang, under Tuensang District.

2. The Project Developer submitted the Project cost as ₹ 225 Crores with IDC, and proposed levellised tariff as @ ₹ 4.73/kWh up to 10th year and @ ₹. 2.52/kWh from 11th year onwards. The Developer proposes to complete the project in the quickest possible period of 24 (twenty four) months.

3. The State government vide Letter No. PWR/EFHPP-28/17 dated 29th November, 2017 forwarded the Petition of M/s. Harit Dynamic Pvt. Ltd for determination of Generation Tariff for the said proposed Small Hydro Power Project as per the Nagaland Electricity Regulatory Commission (Terms and Conditions for Determination of Generation Tariff for Renewable Energy) Regulations, 2011.

4. The Commission, upon following the procedures and in exercise of the powers vested by Section 62(1)&(3) and Section 64 3(a) of the Electricity Act, 2003 and Regulation 10 of Nagaland Electricity Regulatory Commission (Terms and Conditions for Determination of Generation Tariff for Renewable Energy) Regulations, 2011 and other enabling provisions in this behalf, has approved the Generation Tariff @ ₹ **4.69/kWh** up to 10th year and @ ₹ **2.49/kWh** from 11th year onwards 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 unless on account of uncontrollable factors.
c) Signing of Power Purchase Agreement (PPA) betwe en the Project Developer and the State Government is completed.
d) The Execution and Commissioning is completed within 24 months as prescribed in the DPR. However, in the case of a delay in completion, the developer shall apply for time extension with specific reasons.

5. **Power Evacuation (grid connectivity):**

The evacuation of power from the said Small Hydro Power Project shall be through the existing 66/33kv substation at Tuensang.

Sd/-
Er. IMLIKUMZUK AO
Chairman-cum-Member,
NERC, Kohima.

Place: Kohima, Nagaland.
Date: 20th December, 2017.

1. INTRODUCTION

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 21st 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.

The Nagaland Electricity Regulatory Commission for the State of Nagaland started to function with effect from 4th 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 sub-section (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 Project Developer filed a Petition before the Commission on 29th November, 2017 for determination of Generation Tariff for the 22.5 MW Small Hydro Power Project on Yijung River at Hak Chang, Tuensang District, Nagaland. The Developer submitted the project cost as ₹ 225.00 Crores with IDC, estimated generation of energy as 72 MU/Annum and levellised Tariff as ₹. 4.73/kWh up to 10th year and ₹ 2.52/kWh from 11th year onwards.

1.3. Admission of Petition and Publication:

The Commission, after receiving requisite additional information and clarifications from the Project developer, admitted the petition on 30th November, 2017 vide case No.02/2017.

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 1st December 2017 in the 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 8th December, 2017.

Sl. No.	Name of the Newspaper	Language	Date of Publication
1	Nagaland Post	English	01-12-2017
2	The Morung Express	English	01-12-2017
3	Eastern Mirror	English	01-12-2017

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

1.4. Notice for Public Hearing.

The Commission, through the above mentioned Public Notice published on 1st December, 2017 invited the interested stakeholders, general public and consumers to the Public hearing scheduled to be held on 13th December 2017 at Hotel Cimorb's Conference Hall, Kohima on the said petition. The 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 22.5 MW Small Hydro Power Project in Yijung River at Hak Chang, Tuensang District, Nagaland along with Annual Fixed Charges & levellised Tariff. The proposed project cost & AFC are shown in Table below.

Table 2.1: Project cost & AFC projected by petitioner

Description	Estimated cost (₹ in Lakhs)
Civil Works	10118.00
E&M Works	4400.00
Transmission line	2500.00
Others	2715.00
Sub-Total	**19733.00**
IDC	2764.00
Total	**22497.00**
Tariff/kWH	**4.73**

2.2 Prayers of petitioner

The petitioner has prayed in its petition for the following:

- To admit and approve the Petition for the 22.5 MW Small Hydro Power Project in Yijung River at Hak Chang, Tuensang District, Nagaland.
- To approve the tariff submitted by petitioner.
- Condone any inadvertent delay/omissions/errors/rounding off differences/short coming 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

3.1. Public Hearing

As envisages in the Electricity Act, 2003 and also to ensure transparency in the process of determination of tariff, public hearing was held as scheduled on 13th December, 2017 in the Hotel Cimorb's Conference Hall, Old Minister's Hill, Kohima.

3.2. Proceedings of Public Hearing

The Public Hearing was chaired by Er. Imlikumzuk Ao, 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, a power point presentation on the proposed 22.5 MW Small Hydro Power Project was presented by the Project Developer 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 developer. There were queries and replies on many points. The most important point was on Grid Connectivity for Power Evacuation.

Query by Member on Evacuation of Generated Power*:*
How the energy generated from the proposed 22.5 MW Small Hydro Power Project will be evacuated.

Reply by the Developer:
The Developer clarified that evacuation of power will be through the existing 66/33KV Substation at Tuensang.

Query by Member on Connectivity Cost:
Whether, the Developer intends to bear the cost likely to be incurred for grid connectivity in 66/33kv Substation, Tuensang, if the project is developed.

Reply by Developer:
The cost on grid connectivity as required will be borne by the Developer. Also, technical personnel will be deployed to assist in the 66/33KV Substation, Tuensang.

Comments of the Commission:
The Commission analysis that in order to evacuate power from the proposed project, the capacity of the existing 66/33 kv Transformer needs to be upgraded in consultation with the Power Department, Nagaland.

The public hearing is a part of the process for determination of Tariff. The Commission will determine the tariff by taking into consideration all the issues raised in the hearing.

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

1. Er. Imlikumzuk Ao, Chairman (NERC),
2. Shri. W.Y. Yanthan, Secretary (NERC),
3. Er. Kimaba, Joint Director, N&RE Dept, Nagaland,
4. Er. Kahoshe Shohe, SDO (Civil), DoP, Nagaland,
5. Shri. Tiatemjen Jamir, Developer,
6. Rev./Dr. Chingmak Kejong, Developer,
7. Shri. Shivananda Pai B, Developer,
8. Shri. Narayan Bhide, Developer,
9. Shri. Shivito Wotsa, Accounts Officer (NERC),
10. Shri. Limawapang, Legal Consultant (NERC),

Sd/-
W. Y. YANTHAN
Secretary, NERC

4. PROJECT IMPLEMENTATION AND COST

4.1. Overview of the Project

The Hak Chang Small Hydro Project is a run-of-the river development and is proposed using the natural fall of the Yijung river. The Project utilizes seasonal monsoon discharges. This Small Hydel Project is proposed utilising the maximum Gross head of 118m available at the proposed location in the Yijung river in Tuensang District. As about 118m Gross Head and 23 cumecs discharge is available in the stream, it is proposed to install Small Hydel Project to meet the power shortage as well as to tap Renewable Energy Sources. So, the proposed scheme is formulated for design discharge of 23 cumecs and 115m head. The total capacity of the scheme is 22500 KW with 3 units of 7500 KW.

4.2. Grid Connectivity (Power Evacuation)

Developer's Submission:

The Project Developer submitted that the generated power at 11kv will be stepped up to 33kv line and will be evacuated by 33/66kv line (Transmission line) from O.D.Y of Power House. The 66/33 kv line is connected to the nearby Tuensang Power substation (66/33/11) 25 km from the site. Suitable metering arrangement will be proposed at the switchyard as per the stipulation for metering the energy evacuated to the grid.

Commission's Analysis:

The Commission recommends that the capacity of the existing 66/33 kv Transformer be upgraded to evacuate power from the proposed project in consultation with the Power Department, Nagaland.

4.3. Capital Cost Petitioner's submission

4.3.1. The 22.5 MW Hydro Power Project shall be implemented through a turnkey engineering, procurement and construction (EPC) contract.

This total capital cost includes the Civil works, E&M works & other costs including preliminary & pre-operative expenses. The cost includes design, engineering, supply procurement and transport, construction, assembly and testing of equipment and materials to site. Table presents summary of estimate for the proposed 22.5 MW Hydro Power Project.

Description	Estimated cost (₹ in Lakhs)
Civil Works	10118.00
E&M Works	4400.00
Transmission line	2500.00
others	2715.00
Sub-Total	**19733.00**
I D C	2764.00
Total	**22497.00**

4.3.2. Means of Finance

The total estimated project cost is INR 224.97 Crore. The project cost is expected to be funded by mix of Equity and Long-Term Debt.

4.3.3. Project Components & Assumptions

- **Civil Works:**

The costs of civil works are prepared based on preliminary designs and drawings prepared for various components of the project. The main components are Penstock, Surge tank, Penstock, Powerhouse, tail race pool and gates and hoists. The details of the civil works are as follows:

Sl. No.	DESCRIPTION	Estimated Cost (₹ in Lakhs)
1	Weir overflow & Non overflow section	875.30
2	Head Regulator	172.00
3	Penstock (2.4mdia)	3500.00
4	Penstock Civil works (2.4mdia)	2780.00
5	Surge Tank Civil works	427.00
6	Surge Tank (steel)	420.00
7	Power House	1076.30
8	Downstream Transition	318.00
9	Tail Race Channel	249.00
10	Gates & Hoists	300.00
	TOTAL	**10118.00**

- **E&M Works:**

  The ex-works prices of E&M equipment have been worked out based on the competitive rates of budgetary offers. The sales tax at 12% and freight at 3% and insurance at 1% each are included. The spares for 2 years operation are estimated and provided. The tools and plants required for general O&M of the units are estimated and included.

Sl. No.	Description	Estimated Cost (₹ in Lakhs)
1	Main Generating Equipment	4400.00
2	Control Equipment	
3	Switch yard & Switch gear	
4	Auxiliaries	
5	Spares, Tools & Plants	
6	Freight & Insurance	
	Total	**4400.00**

- **Other Costs:**

  The following are the items estimated towards other costs.

i. **Preliminary & Pre-operative Expenses:** A provision of ₹ 300 lakh of project cost has been made towards Preliminary & Pre– operative Expenses.

ii. **Land & Preliminaries:** The cost of land and preliminaries is estimated as ₹ 300.00 lakh which includes ₹ 60.00 lakh towards land and balance ₹ 240.00 lakh towards site clearance, preliminary expenses and development charges payable to State Government for approval of layout etc.

iii. **Surveys and Investigations:** The cost of this item is estimated as ₹ 200.00 lakh, which includes detailed surveys, Hydrological investigations and Geo-Physical investigations and Model studies.

iv. **Infrastructure Works:** This item is estimated as ₹ 575.00 lakh, which includes, providing electricity and communication to the project site, improvement of existing road and approach road for power house site, provision of vehicles for transport and construction of temporary and permanent buildings.

v. **Engineering and Consultancy:** A provision of ₹ 300.00 lakh is made towards Engineering and Consultancy which includes preparation of detailed project report, design and carrying out detailed engineering of civil and electrical & mechanical works besides consultancy for planning of civil works.

vi. **Project Management:** A provision of ₹ 500.00 Lakh is made towards project management which includes establishment charges, loan commitment charges payable to Financial Institutions, Audit and Accounts fees and fees for project approval.

vii. **Contingencies:** A provision of 2.81% of hard cost without IDC has been made towards unforeseen items and contingencies.

The details of other costs are provided in the table below:

Description	Estimated cost (₹ in Lakhs)
Preliminary, Pre–operative Expenses	300.00
Land and Preliminaries	300.00
Surveys and Investigations	200.00
Infrastructure works	575.00
Engineering and Consultancy	300.00
Transmission	2500.00
Project Management	500.00
Contingencies (2.81%)	540.00
Sub-Total	**5215.00**

- **Interest during Construction**

The interest during construction has been estimated by adopting a rate of 14 % for term loan from financial institutions as per the anticipated expenditure spread over the 12 months from the date of 1st disbursement completion period and is worked out as ₹ 2762.00 lakhs.

4.4. Commission's Analysis

The project cost for 22.5 MW Hydro Power Plant submitted by the petitioner is 224.97 Crores. The per MW cost comes to ₹ 10 Crores. The CERC in Regulations 15 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017 has provided normative capital cost for small hydro projects. The normative cost as provided by CERC is provided below.

Region	Project Size	Capital Cost (₹ Lakh/ MW)
Himanchal Pradesh, Uttarakhand, West Bengal and North Eastern States	Below 5 MW	1000
	5 MW to 25 MW	900
Other States	Below 5 MW	779
	5 MW to 25 MW	707

The approved capital cost per MW for the FY 2017-18 for projects in North Eastern States for capacity – 5MW to 25 MW is ₹ 900 Lakh.

In view of the above, project cost @ ₹ 900 Lakh/MW i.e. 202.50 Crores for 22.5 MW is approved.

4.5. Debt Equity Ratio

Provisions relating to the Debt Equity ratio for calculation for interest on loan & return on equity, the provisions as given in the Nagaland Electricity Regulatory Commission (Terms and Conditions for Determination of Generation Tariff for Renewable Energy) Regulations, 2011 has been considered. The Regulations provides as follows:

(i) For suo-motu determination of generic tariff, the debt equity ratio shall be 70: 30.
(ii) For project specific tariff, the following provisions shall apply:

If the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan.

Provided that where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff;

Provided further that the equity invested in foreign currency shall be denominated/designated in Indian rupees on the date of each investment.

Provided further that the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment.

In accordance with the above Regulation, Debt & Equity has been considered for calculation of RoE & Interest on Loan.

5. Annual Fixed Charges

The NERC Regulations provides for the components of AFC and various parameters. The provisions of the Regulations are produced below:

"The tariff for renewable energy technologies shall be single-part tariff consisting of the following fixed cost components:
a) Operation and maintenance expenses.
b) Depreciation.
c) Interest on loan capital.
d) Interest on working capital.
e) Return on equity; "

Each of the above components is analyzed and discussed in the subsequent sections.

5.1. Operation & Maintenance Expenses

The petitioner has submitted O&M expenses at the rate of ₹ 22 Lakh/MW. Thus for 22.5 MW the submitted O&M expenses for the 1st year of the project life is ₹ 495 Lakhs. The O&M expenses for the 1st year has been escalated @ 5.72% year over year to project the O&M expenses over the project life.

The projection of O&M expenses at ₹ 22 Lakh/MW & escalation rate of 5.72% is considered reasonable and is approved.

5.2. Depreciation

Regulation 18 of Nagaland Electricity Regulatory Commission (Terms and Conditions for Determination of Generation Tariff for Renewable Energy) Regulations, 2011 provides as follows:

(1) For the purpose of tariff, the depreciation shall be computed in the following manner.

(a) The value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission.

(a) The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.

(b) Annual Depreciation shall be based on 'Differential Depreciation Approach' using 'Straight Line Method' over two distinct periods comprising loan tenure and period beyond loan tenure over useful life. The depreciation rate for the first 10 years of the Tariff Period shall be 7% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 11th year onwards.

(c) Depreciation shall be chargeable from the first year of commercial operation.
Provided that in case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.

(2) Capital subsidy received by the generator shall not be reduced from the capital cost for depreciation purposes. However, the generator will have to carry out any renovation or replacement or additional capitalization.

However, Regulations 15 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017 provides as follows.

(1) The value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission. The Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.

(2) Depreciation rate of 5.28% per annum for first 13 years and remaining depreciation to be spread during remaining useful life of the RE projects considering the salvage value of the project as 10% of project cost shall be considered.

(3) Depreciation shall be chargeable from the first year of commercial operation.

Provided that in case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.

CERC in recent orders has considered the above provisions to determine the depreciation of Hydro Electric Projects. The above provisions as given in the CERC RE Regulations has been considered for determining the depreciation in this order.

5.3. Interest on Loan Capital

The interest on loan has been considered on the Debt as calculated in the above. The petitioner has submitted the rate of interest as 12% p.a. as tenure of loan as 10 years.

Regulations 14(2)(b) of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017 provides for the rate to be considered for interest on loan. The provisions are reproduced below:

"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 shall be considered."
The average State Bank of India MCLR (One Year Tenor) was 7.95%, accordingly interest on loan should be at 9.95% i.e. 7.95% +2%.

However, petitioner has submitted that the loan for investing in the project is not available below interest rate of 12%. In view of the facts & circumstances of the case, Commission feels it appropriate to allow rate of interest on loan at 12%.

5.4. Interest on Working Capital

Regulation 20 of Nagaland Electricity Regulatory Commission (Terms and Conditions for Determination of Generation Tariff for Renewable Energy) Regulations, 2011 provides as follows:

The Working Capital requirement in respect of wind energy projects, small hydro power, Solar PV and Solar thermal power projects shall be computed as under:

a. *Operation & Maintenance expenses for one month;*
b. *Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilisation Factor (CUF);*
c. *Maintenance spare @ 15% of operation and maintenance expenses.*

Regulations 17(3) of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017 provides for the rate to be considered for interest on working capital. The provisions are reproduced below:

"Interest on Working Capital shall be at interest rate equivalent to the normative interest rate of three hundred (300) basis points above the average State Bank of India MCLR (One Year Tenor) prevalent during the last available six months for the determination of tariff. "

The average State Bank of India MCLR (One Year Tenor) was 7.95%, accordingly interest on working capital has been considered at 10.95% i.e. 7.95% +3%.

However, petitioner has submitted that the loan for investing in the project is not available below interest rate of 12%. In view of the facts & circumstances of the case, Commission feels it appropriate to allow rate of interest on working capital at 12%.

5.5. Return on Equity

Regulations 16 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017 provides for the Return on Equity. The provisions are reproduced below:

(1) The value base for the equity shall be 30% of the capital cost or actual equity (in case of project specific tariff determination) as determined under Regulation 13.

(2) The normative Return on Equity shall be 14%……

The petitioner has submitted RoE at the rate of 14% in the tariff proposal. In view of the above, RoE has been considered at 14%.

6. Calculation of CUF/PLF:

Regulations 29 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017 provides for the CUF. The provisions are reproduced below:

"CUF for the small hydro projects located in Himachal Pradesh, Uttarakhand, West Bengal and North Eastern States shall be 45% and for other States, CUF shall be 30%."

The petitioner has submitted CUF/PLF of 30%, however, considering the topographical & geographical condition of the state as well as actual CUF/PLF of other SHPs in the North Eastern India, CUF/PLF for the project has been considered at 37%.

7. Useful Life of the Project

Regulations 2(10)(cc) of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017 provides for the useful life of the generating stations. The provisions are reproduced below:

'Useful Life' in relation to a unit of a generating station including evacuation system shall mean the following duration from the date of commercial operation (COD) of such generation facility, namely:-

……..
(d) Small Hydro Plant 35 years ……

In view of the above, useful life for determination of Tariff has been considered as 35 years.

8. Tariff Design

Regulations 10 of the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2017 provides for the tariff on levellised basis for the Tariff period. The provisions are reproduced below:

(1) The generic tariff shall be determined considering the year of commissioning of the project, on levellised basis for the Tariff Period. Provided that for renewable energy technologies having single part tariff with two components, tariff shall be determ ined on levellised basis considering the year of commissioning of the project for fixed cost component while the fuel cost component shall be specified on year of operation basis.

(2) For the purpose of levellised tariff computation, the discount factor equivalent to Post Tax weighted average cost of capital shall be considered.

(3) Levellisation shall be carried out for the 'useful life' of the Renewable Energy project.

(4) The above principles shall also apply for project specific tariff.

The discount factor for the purpose of levellised tariff com putation has been considered at weighted average cost of capital of 12%

9. Annual Fixed Charges & Tariff

Based on the parameters approved above, the Annual Fixed Charges (AFC) & levellised Tariff for the SHP is determined. The details of Tariff components & levellised Tariff for the project life of 35 year is provided in the Tables below.

Tariff Components& AFC

YEAR	Head of Expense					
	O&M Expense	Return on Equity	Interest on Loan	Depreciation	Interest on Working Capital	Total
2018-19 (1st Year)	523.31	708.75	1706.01	867.24	92.61	**3897.93**
2nd Year	553.25	708.75	1526.43	867.24	90.41	**3746.08**
3rd Year	584.89	708.75	1346.85	867.24	88.30	**3596.03**
4th Year	618.35	708.75	1167.27	867.24	86.27	**3447.88**
5th Year	653.72	708.75	987.69	867.24	84.34	**3301.74**
6th Year	691.11	708.75	808.11	867.24	82.51	**3157.72**
7th Year	730.64	708.75	628.53	867.24	80.78	**3015.94**
8th Year	772.44	708.75	448.95	867.24	79.16	**2876.53**
9th Year	816.62	708.75	269.37	867.24	77.66	**2739.64**
10th Year	863.33	708.75	89.79	867.24	76.28	**2605.39**
11th Year	594.53	708.75	0.00	867.24	61.28	**2231.81**
12th Year	594.53	708.75	0.00	867.24	61.28	**2231.81**
13th Year	594.53	708.75	0.00	867.24	61.28	**2231.81**
14th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
15th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
16th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
17th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
18th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
19th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
20th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
21st Year	594.53	708.75	0.00	234.13	48.36	**1585.78**

YEAR	Head of Expense					
	O&M Expense	Return on Equity	Interest on Loan	Depreciation	Interest on Working Capital	Total
22nd Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
23rd Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
24th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
25th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
26th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
27th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
28th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
29th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
30th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
31st Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
32nd Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
33rd Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
34th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**
35th Year	594.53	708.75	0.00	234.13	48.36	**1585.78**

Calculation of Levellised Tariff

Particulars	ARR (₹ in Lakhs)	Net Generation (In Mus)	Tariff (₹)	Discounting Factor 12%		Discounted Tariff (₹)
1st Year	3897.93	72.20	5.40	1.00	1.00	5.40
2nd Year	3746.08	72.20	5.19	2.00	0.88	4.57
3rd Year	3596.03	72.20	4.98	3.00	0.77	3.86
4th Year	3447.88	72.20	4.78	4.00	0.68	3.25
5th Year	3301.74	72.20	4.57	5.00	0.60	2.74
6th Year	3157.72	72.20	4.37	6.00	0.53	2.31
7th Year	3015.94	72.20	4.18	7.00	0.46	1.94

Particulars	ARR (₹ in Lakhs)	Net Generation (In Mus)	Tariff (₹)	Discounting Factor 12%		Discounted Tariff (₹)
8th Year	2876.53	72.20	3.98	8.00	0.41	1.63
9th Year	2739.64	72.20	3.79	9.00	0.36	1.36
10th Year	2605.39	72.20	3.61	10.00	0.32	1.14
11th Year	2231.81	72.20	3.09	11.00	0.28	0.86
12th Year	2231.81	72.20	3.09	12.00	0.25	0.76
13th Year	2231.81	72.20	3.09	13.00	0.22	0.67
14th Year	1585.78	72.20	2.20	14.00	0.19	0.42
15th Year	1585.78	72.20	2.20	15.00	0.17	0.37
16th Year	1585.78	72.20	2.20	16.00	0.15	0.32
17th Year	1585.78	72.20	2.20	17.00	0.13	0.28
18th Year	1585.78	72.20	2.20	18.00	0.11	0.25
19th Year	1585.78	72.20	2.20	19.00	0.10	0.22
20th Year	1585.78	72.20	2.20	20.00	0.09	0.19
21st Year	1585.78	72.20	2.20	21.00	0.08	0.17
22nd Year	1585.78	72.20	2.20	22.00	0.07	0.15
23rd Year	1585.78	72.20	2.20	23.00	0.06	0.13
24th Year	1585.78	72.20	2.20	24.00	0.05	0.12
25th Year	1585.78	72.20	2.20	25.00	0.05	0.10
26th Year	1585.78	72.20	2.20	26.00	0.04	0.09
27th Year	1585.78	72.20	2.20	27.00	0.04	0.08
28th Year	1585.78	72.20	2.20	28.00	0.03	0.07
29th Year	1585.78	72.20	2.20	29.00	0.03	0.06
30th Year	158578	72.20	2.20	30.00	0.02	0.05
31st Year	1585.78	72.20	2.20	31.00	0.02	0.05
32nd Year	1585.78	72.20	2.20	32.00	0.02	0.04
33rd Year	1585.78	72.20	2.20	33.00	0.02	0.04
34th Year	1585.78	72.20	2.20	34.00	0.01	0.03
35th Year	1585.78	72.20	2.20	35.00	0.01	0.03

The levellised Tariff for the 22.5 MW Small Hydro Power Project on Yijung River at Hak Chang, Tuensang District is approved as under:

Sl. No.	Levellised Tariff	₹ /kWh
1.	For first 10th year	**4.69**
2.	From 11th year onwards	**2.49**

By Order of the Commission.

Place: Kohima.
Dated: the 20th December, 2017.

Sd/-
W. Y. YANTHAN
Secretary,
Nagaland Electricity Regulatory
Commission, Kohima.

10. DIRECTIVES

Directive 1. Actual Capital Expenditure:

The petitioner is directed to submit the actual capital expenditure incurred up to the date of commercial operation of the generating station duly certified by the statutory auditors for review of this tariff order based on the actual Capital Cost along with all supporting papers & documents.

Directive 2. Loan Agreements:

The petitioner has projected interest rate on loan @ 12% p.a. for 10 years but has not provided any loan agreements/communication from any bank/financial institution in this regard. Hence, the petitioner is directed to submit the agreement between the parties at the earliest.

Directive 3. Fixed Asset Register:

The Commission directs the petitioner to maintain Fixed Asset Register at their end and submit to the Commission as and when asked.

Sd/-
W. Y. YANTHAN
Secretary,
Nagaland Electricity Regulatory
Commission (NERC), Kohima.

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