



**Department of Hydro Power Development
Government of Arunachal Pradesh**



**APPLICATION
FOR
APPROVAL OF CAPITAL COST
&
TARIFF
Mukto MHP**

**Submitted by:
Department of Hydro Power Development-2024**


**Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)**

GENERAL HEADINGS OF PROCEEDINGS

BEFORE THE ARUNACHAL PRADESH STATE ELECTRICITY REGULATORY
COMMISSION (APSERC), ITANAGAR

Filing No.....

Case No.....

IN THE MATTER OF:


APPLICATION FOR APPROVAL OF CAPITAL COST &
TARIFF OF MUKTO MHP IN ACCORDANCE WITH
THE APSERC (TERMS & CONDITIONS FOR TARIFF
DETERMINATION FROM RENEWABLE ENERGY
SOURCES) REGULATIONS, 2018

AND

IN THE MATTER OF:

DEPARTMENT OF HYDRO POWER DEVELOPMENT,
ARUNACHAL PRADESH (HEREINAFTER REFERRED TO
AS DHPD), JAL VIDYUT BHAWAN, ITANAGAR (NEAR
INDIRA GANDHI PARK, ARUNACHAL PRADESH).

..... PETITIONER


Chief Engineer (WZ)
Deptt. of Hydro Power Development
Itanagar (A.P.)




SL. NO.	TABLE OF CONTENT	Page No.
1	BACKGROUND	1
2	Mukto MHP	2
2.1	Energy Sales within the State to Power Department (Mukto MHP)	2
2. A)	Determination of Tariff for the HEP (Mukto MHP)	2
2.2	Capital Cost (Mukto MHP)	4
2.3	Design Energy (Mukto MHP)	5
2.4	Interest on Loan Capital (Mukto MHP)	5
2.5	Depreciation (Mukto MHP)	5
2.6	Return on Equity (ROE) (Mukto MHP)	6
2.7	Operation & Maintenance Expenses (O&M) (Mukto MHP)	7
2.8	Interest on Working Capital (Mukto MHP)	9
2.9	Annual Fixed Charges (AFC) (Mukto MHP)	11
2.10	Tariff (Mukto MHP)	13
2.11	Auxiliary Power Consumption	13
3	TARIFF DESIGN	13
3.1	LEVELIZED TARIFF PROPOSED FOR THE MUKTO MHP	14
	PRAYER	18
	AFFIDAVIT	
	ANNEXURE 1	
	ANNEXURE 2	


 Chief Engineer (WZ)
 Dept. of Hydro Power Development
 Itanagar (A.P.)



LIST OF ABBREVIATIONS

Abbreviation	Description
A&G	Administration & General
ACT	Electricity Act, 2003
APERC	Arunachal Pradesh State Electricity Regulatory Commission
ARR	Aggregate Revenue Requirement
APTEL	Appellate Tribunal For Electricity
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CGS	Central Generating Stations
CPSU	Central Power Sector Undertakings
Cr./Crs	Crore/Crores
D/E	Debt Equity
DHPD	Deptt. of Hydro Power Development
DOP, AP	Department of power, Govt. of Arunachal Pradesh
FY	Financial year
GFA	Gross Fixed Assets
kV	Kilovolt
kVA	Kilo Volt Amps
kwh	Kilo Watt Hour
MU	Million Units
MVA	Million Volt Amps
MW	Mega Watt
O&M	Operation & Maintenance
ROE	Return on Equity
RoR	Rate of Return
Rs.	Rupees
SS	Sub Station
SBI	State Bank of India


 Chief Engineer (WZ)
 Deptt. of Hydro Power Development
 Itanagar (A.P.)



Abbreviation	Description
SBI-PLR	State Bank of India- Prime Lending Rate (Short Term)
SBI-MCLR	State Bank of India- Marginal Cost Lending Rate
SERC	State Electricity Regulatory Commission
R&M	Repairs and Maintenance
YoY	Year on Year


Chief Engineer (WZ)
Deptt. of Hydro Power Development,
Itanagar (A.P.)





1. BACKGROUND

In order to oversee, co-ordinate and monitor the development of hydro power in the State of Arunachal Pradesh, the State Govt. created a separate department namely "Department of Hydro Power Development" on 12/11/2003. It is a full-fledged department headed by a Chief Engineer. The Department is entrusted with the development of micro / mini / small hydro project, improvement of existing hydro projects including renovation & modernization works, operation and maintenance of existing hydel stations, survey & investigation of new potential sites, and construction of residential and non-residential building for the Department. The Department is foremost concentrating on the urgent need of bridging the existing demand supply gap in order to make the State self-reliant, so far as power needs of the State are concerned and to help achieve the target of all village's electrification and all household electrification.

Regulation 7 of Renewable Energy Sources Regulations, 2018 provides that project specific tariff is to be determined for SHPs of installed capacity of 1MW to 25MW.


Further, Hon'ble Commission in the Tariff order for the FY 2017-18 Dt. 02.11.2018 has directed DHPD to file consolidated ARR and average tariff for plants commissioned before 31.03.2017.

Further, Hon'ble Commission vide letter No APSERC/RA-8/I/2024-25/86 Dt 24 June, 2024 directed as follows:

- i. For 116 Projects Commissioned before FY 2017 shall be covered under RE Regulation 2024 and accordingly, in consolidated form petition for 116 projects for FY 2024-25 is required to be submitted.
- ii. For new projects below 1 MW, the petitioner may opt for either the generic tariff or a project specific tariff on a levelized basis for the project's entire life. The generic tariff order for FY 2024-25 shall be issued by the commission shortly. If opting for the project-specific tariff, a separate plant-wise petition with the requisite fee and all details mentioned in section 8 & 9 of the RE Regulation, 2024 must be filed.
- iii. For new projects of 1 MW and above, you have submitted a consolidated petition for 6 such projects whereas a separate project-wise petition with the requisite fee as per details mentioned in section 8 & 9 of the RE Regulation, 2024 must be filed to get the levelized tariff for the project's useful life.

In view of the above direction of the Hon'ble Commission and provisions of Renewable Energy Sources Regulations, 2018, DHPD is submitting petition for determination of capital cost & Tariff of Mukto MHP.

Department of Hydro Power Development, Arunachal Pradesh


Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)





2. Mukto MHP

The Mukto MHP has installed capacity of 6 MW. The details of the project are given here under:

3. Details of Hydro Electric Power Station

SL. No.	Name of the Stations	Units	Installed Capacity	Firm Capacity	Year of Commissioning
Western Zone (WZ)			(KW)	(KW)	
Tawang District					
01	Mukto MHS	3 x 2000	6000	6000	2018-19

2.1 ENERGY SALES WITHIN THE STATE TO POWER DEPARTMENT

The entire quantity of electricity generated by the HEP is being sold within the State to the Power Department.

2.1 Performance during 2022-23

SL. No.	Name of the Stations	Units	Installed Capacity	Actual Net Generation
Western Zone (WZ)			(KW)	(KWH)
Tawang District				
1	Mukto MHS	3 x 2000	6000	0

A. DETERMINATION OF TARIFF FOR THE HEP

The Hon'ble Arunachal Pradesh State Electricity Regulatory Commission has issued the Arunachal Pradesh State Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2018 to determine the Tariff of Renewable Energy projects in the state of Arunachal Pradesh.

Regulation 7 of Renewable Regulations, 2018 provides that project specific tariff is to be determined for SHPs of installed capacity of 1MW to 25MW.

Department of Hydro Power Development, Arunachal Pradesh

Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)





Petition for Approval of Capital Cost & Tariff of Mukto
MHP

The COD of the Mukto MHP was declared on 01.04.2018. Accordingly, DHPD is submitting this petition in respect of Mukto MHP for approval of Capital cost & determination of Tariff in accordance with the parameters as defined in the APSEERC (Terms & Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2018.

The RE Regulations, 2018 provides that the tariff for sale of electricity from a hydro power station shall be aimed at recovering the Annual Fixed Charges and various components of AFC has been defined in Regulation 9. Accordingly, following has been considered for calculating Annual Fixed Charges for the SHP:

Annual Fixed Charges:

The Annual Fixed Charges (AFC) is determined based on following factors: -

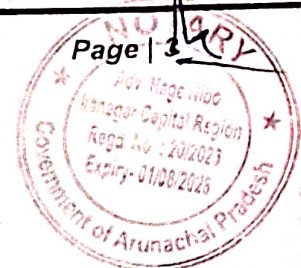
- Project Cost
- Design Energy
- Interest on Loan Capital.
- Depreciation.
- Return on Equity.
- Operation & Maintenance Expenses.
- Interest on Working Capital.

The assumptions considered for the HEP are given below:

Sl. No.	Particulars	Unit	Value
1	Auxiliary Consumption	%	1
2	O&M Expenses		Below 5MW – 38.06 Lakh/MW 5MW-25MW- 28.54 Lakh/MW
	Escalation	%	5.72% per annum
3	Depreciation		Rate of depreciation taken @ 5.28% as per RE Regulations,2018

Department of Hydro Power Development, Arunachal Pradesh

Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)





Petition for Approval of Capital Cost & Tariff of Mukto MHP

MHP

Sl. No.	Particulars	Unit	Value	
	Plant Life	years	35	
	Residual	%	10	
4	Working Capital			
	Receivable (2 months Energy Charges)	Months	2	
	O & M Expenses	Months	1	
	Spares for Maintenance	%	15	O&M Expenses
	Rate of Interest	%	SBI MCLR (One year Tenor) + 300 basis point	
5	Return on Equity	%	14	
6	Equity	%	30	Net Project Cost
	Loan	%	70	Net Project Cost
7	Interest	%	SBI MCLR (One Year Tenor) + 200 basis point	
8	Moratorium		Not Applicable	

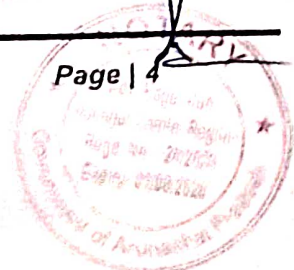
Further, details/parameters in Form 1.1 as prescribed in Regulation 53 of RE Regulations, 2018 is attached as Annexure.

2.2. Capital Cost

Regulation 7 of Renewable Regulations, 2018 provides that project specific tariff is to be determined for SHPs of installed capacity of 1MW to 25MW. The Mukto MHP has installed capacity of 6 MW. Accordingly, actual project cost is submitted for consideration and approval of the Hon'ble Commission. The component wise details along with the technical & financial parameters and justifications are provided in the attached DPR/ revised DPR.

Department of Hydro Power Development, Arunachal Pradesh

Chief Engineer (WZ)
Deptt. of Hydro Power Development
Itanagar (A.P.)





Petition for Approval of Capital Cost & Tariff of Mukto
MHP

The Capital cost are provided below for the consideration of the Hon'ble Commission.

Table - 2.2 Capital Cost:			
Sl. No.	Name of Station	Installed Capacity (MW)	Capital Cost IN (Lakhs)
1	Mukto MHP	6.00	7998.70

2.3 Design Energy

Design energy of the HEP has been calculated in accordance with the APSERC Regulations. Design energy of the HEP is provided in the table below.

2.3 Design Energy

SL. No.	Name of the Station	Installed Capacity	Design Energy (Annual)
Western Zone (WZ)		(KW)	(MU)
Tawang District			
1	Mukto MHS	6000	49.93

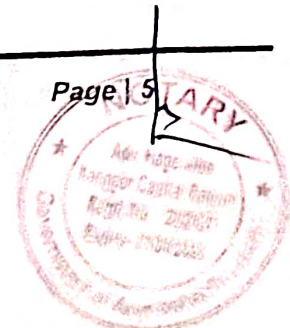
2.4 Interest on Loan Capital

Clause 14 of APSERC RE Regulations, 2018 provides that interest on loan taken to fund the cost of project shall be recovered through tariff. DHPD has not taken any loan for financing the projects. In view of the above, no interest on loan has been claimed. DHPD submits that it will claim interest on loan in accordance with the above regulation in case loan is availed for financing of projects in future.

2.5 Depreciation

The DHPD has proposed depreciation as per clause 15 of RE regulations, 2018. The Regulation provides as follows:

"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."





Petition for Approval of Capital Cost & Tariff of Mukto
MHP

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.....”

The depreciation rate considered over the life of the SHP is provided in the Table below.

Particulars	Details
Useful life in years	35
Rate of Depreciation – 1st 13 Years (%)	5.28
Rate of Depreciation – after 13 Years (%)	0.97

Based on the above principle, year wise depreciation for the 35 years is provided below.

(Rs. Lakhs)

Calculation of Depreciation						
Sl. No.	Name of Station	Date of COD	Capital Cost	Balance Useful Life	Depreciation /year upto 13th Year	Depreciation from 14th Year
1	Mukto MHS	01-04-2018	7998.70	35	422.33	77.66

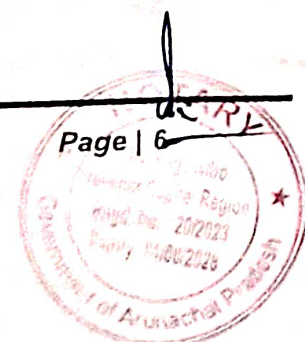
It is submitted that the Hon'ble Commission may kindly consider and approve the Depreciation as proposed above.

2.6 Return on Equity (ROE)

Sub-Regulation (1) of Regulation 16 of the RE Tariff Regulations, 2018 provides that the value base for the equity shall be 30% of the capital cost for tariff determination. Sub-Regulation (2) of the said Regulation stipulates the normative Return on Equity (ROE) as 14%, to be grossed up by prevailing Minimum Alternate Tax (MAT) as on 1st April of previous year for the entire useful life of the project.

Department of Hydro Power Development, Arunachal Pradesh

Chief Engineer (WZ)
Deptt. of Hydro Power Development
Itanagar (A.P.)





The MAT rate has not been considered as DHPD being Government Department, there is no MAT/Corporate Tax liability. The capital cost for calculation of ROE has been considered as discussed in the previous section.

The Equity for the purpose of calculation of ROE has been computed as per Regulation 16 of APSERC RE Regulations, 2018. Accordingly, Debt-Equity ratio of 70:30 has been considered. Summary of ROE of SHP is provided below.

Sl. No.	Capital cost	Equity	RoE
	Mukto MHS	30%	14%
1	7998.70	2399.61	335.95

2.7 Operation & Maintenance Expenses

As per clause 29 of RE Regulations, 2018, the normative O&M expenses for the first year of the control period (i.e., FY 2018-19) shall be as follows: -

Region	Project Size	O&M Expenses (Rs. Lakh/MW)
Arunachal Pradesh	Below 5 MW	38.06
	5 MW to 25 MW	28.54

The Regulation further provides that the normative O&M expenses allowed under these Regulations shall be escalated at the rate of 5.72% per annum for the Tariff Period for the purpose of determination of levelized tariff.

The Installed capacity of the Project being 6 MW, the applicable normative O&M expenses is Rs. 28.54 Lakhs/MW for the FY 2018-19 (base year).

The O&M expenses for each subsequent year has been calculated based on the above principle. The O&M expenses for the 35 years is provided below.



Petition for Approval of Capital Cost & Tariff of Mukto
MHP

Sl. No.	Name of Station	Capacity (MW)	Normative O&M Expense /MW)	Normative O&M Expense/MW	Escalation Rate / Annum
				At base FY 2018-19	
1	Mukto MHS	6.00	28.54	171.24	5.72%

(Rs. Lakhs)

FY 2018-19 (1st Year)	2nd Year	3rd Year	4th Year	5th Year	6th Year	7th Year	8th Year	9th Year	10th Year
171.24	181.03	191.39	202.34	213.91	226.15	239.08	252.76	267.22	282.50

(Rs. Lakhs)

11th Year	12th Year	13th Year	14th Year	15th Year	16th Year	17th Year	18th Year	19th Year	20th Year
298.66	315.74	333.80	352.90	373.08	394.42	416.98	440.84	466.05	492.71

(Rs. Lakhs)

21st Year	22nd Year	23rd Year	24th Year	25th Year	26th Year	27th Year	28th Year	29th Year	30th Year
520.89	550.69	582.19	615.49	650.69	687.91	727.26	768.86	812.84	859.34

(Rs. Lakhs)

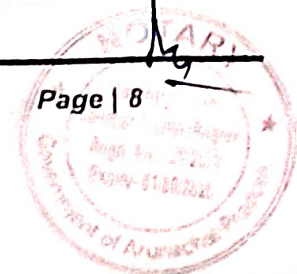
31st Year	32nd Year	33rd Year	34th Year	35th Year
908.49	960.45	1015.39	1073.47	1134.88

It is submitted that the Hon'ble Commission may kindly consider and approve the O&M expenses as proposed above.

Department of Hydro Power Development, Arunachal Pradesh

[Signature]
Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)

Page | 8





2.8 Interest on Working Capital

The Working Capital requirement has been calculated in accordance with the clause 17(1) of the APERC RE Regulation, 2018, with the following:

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

Further, clause 17(3) of the APERC RE Regulation, 2018 provides as follows:

“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.”

Interest rate has been considered as average of State Bank of India MCLR (One Year Tenor) prevalent during the last available six months of the previous year plus 300 basis points.

Accordingly, Interest @ 11.25 % per annum on working capital has been considered which is 300 basis points above the SBI MCLR (One year tenor) for last six months.

The average SBI MCLR (One year tenor) for last six months is 8.25%.

The Interest on Working Capital for 35 years of the life of the SHP is provided below.

(Rs. Lakhs)

Sl. No.	Particulars	Parameters	FY 2018-19 (1st Year)	2nd Year	3rd Year	4th Year	5th Year	6th Year
1	Operation & Maintenance Exp.	One month	14.27	15.09	15.95	16.86	17.83	18.85
2	Receivables	Two Months	158.64	160.35	162.16	164.06	166.08	168.21
3	Maintenance Spares -	15% of O&M Expenses	25.69	27.16	28.71	30.35	32.09	33.92
4	Total		198.60	202.59	206.81	211.28	215.99	220.98
5	Interest	11.25%	22.34	22.79	23.27	23.77	24.30	24.86



Petition for Approval of Capital Cost & Tariff of Mukto
MHP

(Rs. Lakhs)

7th Year	8th Year	9th Year	10th Year	11th Year	12th Year	13th Year	14th Year	15th Year
19.92	21.06	22.27	23.54	24.89	26.31	27.82	29.41	31.09
170.47	172.85	175.37	178.04	180.85	183.83	186.98	131.76	135.28
35.86	37.91	40.08	42.38	44.80	47.36	50.07	52.93	55.96
226.25	231.83	237.72	243.95	250.54	257.50	264.87	214.11	222.34
25.45	26.08	26.74	27.44	28.19	28.97	29.80	24.09	25.01

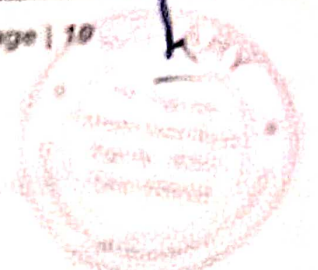
(Rs. Lakhs)

16th Year	17th Year	18th Year	19th Year	20th Year	21st Year	22nd Year	23rd Year	24th Year	25th Year	26th Year
32.87	34.75	36.74	38.84	41.06	43.41	45.89	48.52	51.29	54.22	57.33
139.00	142.94	147.09	151.49	156.14	161.05	166.24	171.73	177.54	183.67	190.16
59.16	62.55	66.13	69.91	73.91	78.13	82.60	87.33	92.32	97.60	103.19
231.04	240.23	249.96	260.23	271.10	282.59	294.74	307.58	321.15	335.50	350.67
25.99	27.03	28.12	29.28	30.50	31.79	33.16	34.60	36.13	37.74	39.45

(Rs. Lakhs)

27th Year	28th Year	29th Year	30th Year	31st Year	32nd Year	33rd Year	34th Year	35th Year
60.61	64.07	67.74	71.61	75.71	80.04	84.62	89.46	94.57
197.02	204.27	211.94	220.04	228.61	237.67	247.24	257.37	268.07
109.09	115.33	121.93	128.90	136.27	144.07	152.31	161.02	170.23
366.72	383.67	401.60	420.55	440.59	461.77	484.17	507.85	532.88
41.26	43.16	45.18	47.31	49.57	51.95	54.47	57.13	59.95

[Signature]
Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)





It is submitted that the Hon'ble Commission may kindly consider and approve the Interest on Working Capital as proposed above.

2.9 TOTAL ANNUAL FIXED CHARGES (AFC) FOR THE HEP

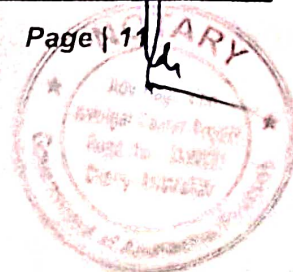
The Annual Fixed Charges have been calculated based on the components of cost as detailed above. The year wise AFC of the SHP for 35 years is provided below.

(Rs. Lakhs)

Head of Expense	2018-19 (1st Year)	2nd Year	3rd Year	4th Year	5th Year	6th Year
O&M Expense	171.24	181.03	191.39	202.34	213.91	226.15
Return on Equity	335.95	335.95	335.95	335.95	335.95	335.95
Interest on Loan	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation	422.33	422.33	422.33	422.33	422.33	422.33
Interest on Working Capital	22.34	22.79	23.27	23.77	24.30	24.86
Total	951.86	962.10	972.93	984.38	996.49	1009.28

(Rs. Lakhs)

7th Year	8th Year	9th Year	10th Year	11th Year	12th Year	13th Year	14th Year
239.08	252.76	267.22	282.50	298.66	315.74	333.80	352.90
335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
422.33	422.33	422.33	422.33	422.33	422.33	422.33	77.66
25.45	26.08	26.74	27.44	28.19	28.97	29.80	24.09
1022.81	1037.12	1052.24	1068.22	1085.12	1102.99	1121.88	790.59





Petition for Approval of Capital Cost & Tariff of Mukto
MHP

(Rs. Lakhs)

15th Year	16th Year	17th Year	18th Year	19th Year	20th Year	21st Year	22nd Year
373.08	394.42	416.98	440.84	466.05	492.71	520.89	550.69
335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77.66	77.66	77.66	77.66	77.66	77.66	77.66	77.66
25.01	25.99	27.03	28.12	29.28	30.50	31.79	33.16
811.70	834.02	857.62	882.56	908.93	936.81	966.29	997.45

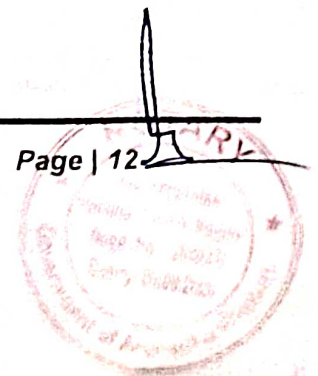
(Rs. Lakhs)

23rd Year	24th Year	25th Year	26th Year	27th Year	28th Year	29th Year	30th Year	31st Year
582.19	615.49	650.69	687.91	727.26	768.86	812.84	859.34	908.49
335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77.66	77.66	77.66	77.66	77.66	77.66	77.66	77.66	77.66
34.60	36.13	37.74	39.45	41.26	43.16	45.18	47.31	49.57
1030.39	1065.22	1102.04	1140.97	1182.12	1225.63	1271.63	1320.25	1371.66

(Rs. Lakhs)

32nd Year	33rd Year	34th Year	35th Year
960.45	1015.39	1073.47	1134.88
335.95	335.95	335.95	335.95
0.00	0.00	0.00	0.00
77.66	77.66	77.66	77.66
51.95	54.47	57.13	59.95
1426.01	1483.47	1544.21	1608.43

Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)





It is submitted that the Hon'ble Commission may kindly consider and approve the Annual Fixed Charges as proposed above.

2.10. Capacity Utilisation Factor (CUF)

Clause 27 of the RE Regulations 2018, provides that CUF for the small hydro projects shall be 45%. Further, clause 18 of the RE Regulations 2018 provides as follows:

"The number of hours for calculation of CUF/PLF (wherever applicable) for various RE technologies shall be 8766."

Accordingly, DHPD has considered CUF of 45% for proposing the tariff.

2.11. Auxiliary Power Consumption

Regulations 28 of the RE Regulations 2018 provides as follows:

"Normative Auxiliary Consumption for the small hydro projects shall be 1 %"

The above CUF & rate of auxiliary consumption has been considered for calculation of saleable energy for the project. The calculation of Gross Generation, Auxiliary consumption & Saleable energy based on the above Regulations is provided below.

Installed Capacity (MW)	Hours	CUF (%)	Gross Generation (MUs)	Auxiliary Consumption @1%	Net Generation (MUs)
6.00	8766	45.00	23.67	0.24	23.43

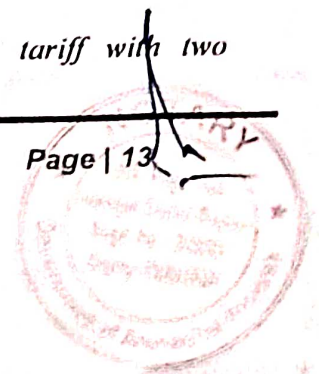
3. TARIFF DESIGN

Regulation 10 of the RE Regulations, 2018 provides for the tariff design & calculation of levelized tariff. The provisions of the Regulation are given below.

"1. The generic tariff shall be determined considering the year of commissioning of the project, on levelized basis for the Tariff Period.

Provided that for renewable energy technologies having single part tariff with two

Chief Engineer (WZ)
Deptt. of Hydro Power Development
Itanagar (A.P.)





components, tariff shall be determined on levelized 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 levelized tariff computation, the discount factor equivalent to Post Tax weighted average cost of capita 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."

In accordance with the above Regulations, levelized tariff has been calculated for the life of the project i.e. 35 years. Discounting factor equivalent to Post Tax weighted average cost of capital has been considered.

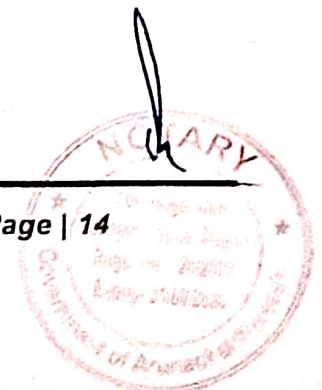
Particulars	Amount/Rate	
capital cost		7998.70
Debt	70%	5599.09
Equity	30%	2399.61
Interest rate		10.25%
RoE		14.00%
Tax Rate		0.00%
Capital - Loan		7.18%
Capital Cost - Equity		4.20%
Weighted Average Cost of Capital (WACC)/Discount Rate		11.38%

It is submitted that the Hon'ble Commission may kindly consider and approve the Discounting rate as proposed above.

3.1 LEVELIZED TARIFF PROPOSED FOR THE MUKTO MHP: -

The levelized tariff of the Mukto MHP has been calculated on the basis of the component wise cost, saleable energy, discounting factor as detailed in the previous sections. The calculation of the levelized tariff for the project life of 35 years is provided in the tables below. Form 2.1 as prescribed in Regulation 55 of RE Regulations, 2018 is attached as Annexure.

Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)

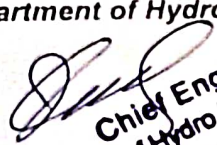




Petition for Approval of Capital Cost & Tariff of Mukto
MHP

Sl. No.	Particulars	Discount Rate	FY 2018-19 (1st Year)	2nd Year	3rd Year	4th Year	5th Year	6th Year
1	ARR (in Lakhs)		951.86	962.10	972.93	984.38	996.49	1009.28
2	Net Generation (In Mus)		23.43	23.43	23.43	23.43	23.43	23.43
3	Tariff (Rs./unit)		4.06	4.11	4.15	4.20	4.25	4.31
4			1.00	2.00	3.00	4.00	5.00	6.00
5	Discounting Factor	11.38%	1.00	0.89	0.79	0.70	0.62	0.55
6	Discounted Tariff (Rs./unit)		4.06	3.64	3.26	2.92	2.62	2.36




Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)



**Petition for Approval of Capital Cost & Tariff of Mukto
MHP**

7th Year	8th Year	9th Year	10th Year	11th Year	12th Year	13th Year	14th Year	15th Year
1022.81	1037.12	1052.24	1068.22	1085.12	1102.99	1121.88	790.59	811.70
23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43
4.37	4.43	4.49	4.56	4.63	4.71	4.79	3.37	3.46
7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00
0.48	0.43	0.38	0.34	0.30	0.26	0.23	0.21	0.18
2.12	1.90	1.71	1.54	1.38	1.25	1.12	0.70	0.64

16th Year	17th Year	18th Year	19th Year	20th Year	21st Year	22nd Year	23rd Year	24th Year
834.02	857.62	882.56	908.93	936.81	966.29	997.45	1030.39	1065.22
23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43
3.56	3.66	3.77	3.88	4.00	4.12	4.26	4.40	4.55
16.00	17.00	18.00	19.00	20.00	21.00	22.00	23.00	24.00
0.16	0.14	0.13	0.11	0.10	0.09	0.08	0.07	0.06
0.58	0.53	0.48	0.44	0.40	0.37	0.34	0.31	0.28

25th Year	26th Year	27th Year	28th Year	29th Year	30th Year	31st Year	32nd Year
1102.04	1140.97	1182.12	1225.63	1271.63	1320.25	1371.66	1426.01
23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43
4.70	4.87	5.05	5.23	5.43	5.63	5.85	6.09
25.00	26.00	27.00	28.00	29.00	30.00	31.00	32.00
0.06	0.05	0.04	0.04	0.03	0.03	0.03	0.02
0.26	0.24	0.22	0.20	0.18	0.17	0.16	0.14



[Signature]
 Chief Engineer (VZ)
 Dept. of Hydro Power Development
 Itanagar (A.P.)



Petition for Approval of Capital Cost & Tariff of Mukto
MHP

33rd Year	34th Year	35th Year
1483.47	1544.21	1608.43
23.43	23.43	23.43
6.33	6.59	6.86
33.00	34.00	35.00
0.02	0.02	0.02
0.13	0.12	0.11

Particulars	Tariff
Total of Tariff	36.90
Total of Discounting Factor	8.66
Levelized tariff - 35 years - Rs. /Unit	4.26




Chief Engineer (WZ)
Dept. of Hydro Power Development
Itanagar (A.P.)



*Petition for Approval of Capital Cost & Tariff of Mukto
MHP*

PRAYER

It is respectfully prayed that the Hon'ble Commission may be pleased to:

- (a) Approve the Capital cost & Tariff as submitted
- (b) Pass such other and further order(s) as are deemed fit and proper in the facts and circumstances of the case.

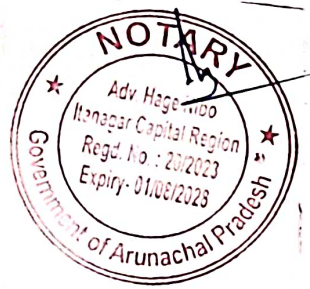
Authorised Signatory

**Chief Engineer (WZ)
Deptt. of Hydro Power Development
Itanagar (A.P.)**

Place: Itanagar

Date:





**BEFORE HON'BLE ELECTRICITY REGULATORY COMMISSION
FOR THE STATE OF ARUNACHAL PRADESH**

FILE No: _____

CASE No: _____

IN THE MATTER OF : **Petition for Approval of Capital Cost & Tariff of Mukto MHP
under Sections 61, 62 and 64 of The Electricity Act 2003**

AND

IN THE MATTER OF : **Department of Hydro Power Development, Jal Vidyut Bhawan,
Itanagar, Arunachal Pradesh**

THE PETITIONER

.....Petitioner

AFFIDAVIT

I **Shri Jummar Kamdak**, son of **Lt. Tojum Kamdak** (aged 59 years), residing at **Kamdak Apartment, 'D' Sector, Itanagar, A.P** do hereby solemnly affirm and state as follows:-

1. That I am the **Chief Engineer (WZ)** of the Department of Hydro Power Development, Government of Arunachal Pradesh, the petitioner in the above matter and am duly authorized by the said petitioner to make this affidavit on its behalf.
2. That the statements made in **paragraphs 1 to 3.1** of the petition are true to the best of my knowledge and belief and nothing material has been concealed there from.
3. That in respect of petition filing fee of this petition, it is clarified that a sum of Rs 20 Lakhs have already been deposited by DHPD in case of certain petitions filed before the commission, for which orders have not been issued by the commission. This amount shall be adjusted towards the fee in respect of this petition as per direction in the record of proceeding in Diary No.01 of 2024 dtd 29/08/24.
4. That the remaining fee of Rs 10 Lakhs that is required to be paid by DHPD will be paid within the given period as specified in the record of proceeding in Diary No.01 of 2024 dtd 29/08/24, subject to the approval of the Govt. of AP.

Chief Engineer (WZ)
Deptt. of Hydro Power Development
Itanagar (A.P.)

Verification



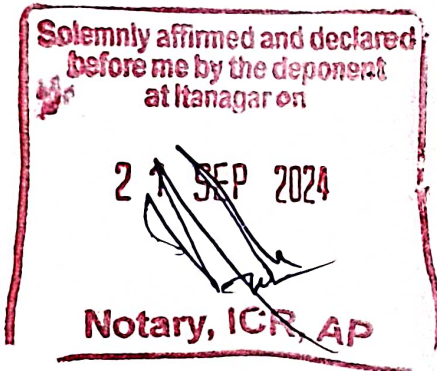
I, the deponent above named do hereby verify that the contents of my above affidavit are true to my knowledge; no part of it is false and nothing material has been concealed there from

Verified at Itanagar on the day of 20th Sept. 2024

Place: Itanagar


Date: 20/9/2024

Deponent
Chief Engineer (WZ)
Deptt. of Hydro Power Development
Itanagar (A.P.)



Adv. Hage Nibo
Advocate & Notary Public, Govt. of A.P
D.C Office, Chandra Nagar, Itanagar
Regd. No : 20/2023
Expiry : 01/08/2028

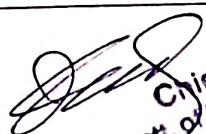
ANNEXURE

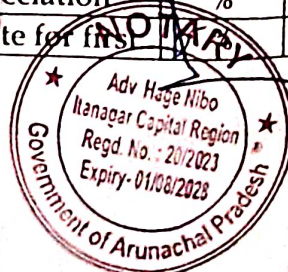


Chief Engineer (WZ)
Deptt. of Hydro Power Development
Itanagar (A.P.)


Annexure 1

Mukto MHS					
Form-1.1: Form Template for (Small Hydro Project or Solar PV or Wind Power)					
Sl No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Arunachal Pradesh
1	Power Generation	Capacity			
			Installed Power Generation Capacity	MW	6.00
			Capacity Utilization Factor	%	45.00
			Auxiliary Consumption	%	1
			Useful Life	Years	35
2	Project Cost	Capital Cost/MW	Power Plant Cost	₹ Lacs/MW	7998.700
3	Period		Tariff period	Years	35
4	Sources of Fund	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	₹ Lacs	5599.09
			Total Equity Amount	₹ Lacs	2399.61
		Debt Component	Loan Amount	₹ Lacs	No Debt Considered. Funded Through Grant.
			Moratorium Period	Years	
			Repayment Period (Include Moratorium)	Years	
			Interest Rate	%	
		Equity Component	Equity amount	₹ Lacs	2399.61
			Return on Equity for first Project Life	% pa	14%
			Discount Rate		11.38%
		5	Financial Assumptions	Fiscal Assumption	Income tax
Depreciation	Allowed Depreciation			%	90
	Depreciation Rate for first				


Chief Engineer (WZ)
 Dept. of Hydro Power Development
 Itanagar (A.P.)



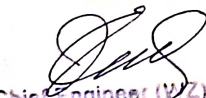
Mukto MHS						
Form-1.1: Form Template for (Small Hydro Project or Solar PV or Wind Power)						
			13 Years			
			Depreciation Rate 14th year onwards	%	0.97	
		Incentive	Generation based incentive if any	₹ Lakh	NA	
			Period for GBI	Years		
6	Working Capital	For Fixed Charges				
		O&M Charges		Month s	1	
		Maintenance Spare	(% of O&M expense)			15
		Receivables for Debtors		Month s	2	
		Interest on Working Capital		%	11.25%	
7	Operation & Maintenance	O&M Expenses (2018-19)		₹ Lacs	28.54	
		Total O & M Expenses Escalation		%	5.72%	
8	Generation and sale of Energy					
		Total No. of Hours		Hrs		


 Chief Engineer (WZ)
 Dept. of Hydro Power Development
 Itanagar (A.P.)



Annexure 2

Form-2.1: Form Template for (Small Hydro Project or Solar PV or Wind Power) : Determination of Tariff																																								
			B/E Tariff (Small Hydro Project, Solar PV, Wind Power)																																					
Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			
Installed Capacity	MW		6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00		
Gross Generation	MU		23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67	23.67		
Auxiliary Consumption	MU		0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
Net Generation	MU		23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	23.43	
Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			
O&M Expenses	Rs Lakh		171.24	181.03	191.39	202.34	213.91	226.15	239.08	252.76	267.22	282.50	298.66	315.74	333.80	352.90	373.08	394.42	416.98	440.84	466.05	492.71	520.89	550.69	582.19	615.49	650.69	687.91	727.26	768.86	812.84	859.34	908.49	960.45	1015.19	1073.47	1134.85			
Depreciation	Rs Lakh		422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	422.33	
Interest on Term Loan	Rs Lakh		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Interest on Working Capital	Rs Lakh		22.24	22.79	23.27	23.77	24.30	24.86	25.45	26.08	26.74	27.44	28.19	28.97	29.80	30.69	31.61	32.57	33.57	34.61	35.69	36.81	37.97	39.17	40.41	41.69	43.01	44.37	45.77	47.21	48.69	50.21	51.77	53.37	55.01	56.69	58.41	60.17	61.97	
Return On Equip	Rs Lakh		335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95	335.95
Total Fixed Cost	Rs Lakh		951.86	962.10	972.93	984.38	996.49	1009.28	1022.81	1037.12	1052.24	1068.22	1085.12	1102.99	1121.88	1141.80	1162.76	1184.78	1207.88	1232.08	1257.38	1283.79	1311.32	1340.00	1369.84	1400.86	1433.08	1466.51	1501.17	1537.07	1574.23	1612.67	1652.41	1693.47	1735.87	1779.63	1824.77	1871.31	1919.27	
Per Unit Cost of Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			
O&M Expenses	Rs/Wh		0.73	0.77	0.82	0.86	0.91	0.97	1.02	1.08	1.14	1.21	1.27	1.35	1.42	1.51	1.59	1.68	1.78	1.88	1.99	2.10	2.22	2.35	2.48	2.63	2.78	2.94	3.10	3.28	3.47	3.67	3.88	4.10	4.33	4.58	4.84			
Depreciation	Rs/Wh		1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80	
Int on Term Loan	Rs/Wh		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Int on Working Capital	Rs/Wh		0.10	0.10	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.10	0.11	0.11	0.12	0.12	0.12	0.13	0.14	0.14	0.15	0.15	0.16	0.17	0.18	0.18	0.19	0.20	0.21	0.22	0.23	0.24	0.24	0.26		
RoE	Rs/Wh		1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	
Total COG	Rs/Wh		4.06	4.11	4.15	4.20	4.25	4.31	4.37	4.43	4.49	4.56	4.63	4.71	4.79	4.87	4.96	5.06	5.16	5.27	5.38	5.50	5.63	5.77	5.91	6.06	6.22	6.39	6.57	6.76	6.96	7.17	7.39	7.62	7.86	8.11	8.37	8.64	8.92	
Discount Factor			1.00	0.99	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.90	0.89	0.88	0.87	0.86	0.85	0.84	0.83	0.82	0.81	0.80	0.79	0.78	0.77	0.76	0.75	0.74	0.73	0.72	0.71	0.70	0.69	0.68	0.67	0.66	0.65	
Discounted Tariff			4.06	3.64	3.26	2.92	2.62	2.36	2.12	1.90	1.71	1.54	1.38	1.25	1.12	0.70	0.64	0.58	0.53	0.48	0.44	0.40	0.37	0.34	0.31	0.28	0.26	0.24	0.22	0.20	0.18	0.17	0.16	0.14	0.13	0.12	0.11	0.11		
Levelized Tariff	Rs/Unit		4.26																																					


 Chief Engineer (V/2)
 Dept. of Hydro Power Development
 Manager (A.P.)

