

Part – IV

Tariff Petition for the period
from FY 2018-19 to FY 2020-21

for

Generation Function

Submitted by:

Energy & Power Department,

Government of Sikkim

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1. BASIS OF FILING – MULTI YEAR TARIFF REGULATIONS, 2013

E&PDS's tariff determination is now governed by "Sikkim State Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff for Generation, Transmission, Wheeling and Distribution & Retail Supply under Multi Year Tariff Framework)(Second Amendment) Regulations, 2017" (referred to as "MYT Regulations, 2017") notified vide No. 14/SSERC/MYT/AMDT/2015/200 Dated 20.06.2017. However, Regulation 36.1 of the MYT Regulations, 2013 provide as follows:

"The regulations specified in this chapter shall apply for determining the tariff for supply of electricity to a Distribution Licensee from conventional sources of generation and hydro generation stations of capacity more than 25 MW:

Provided that determination of tariff for supply of electricity to a Distribution Licensee from Renewable Energy sources of generation shall be in accordance with terms and conditions as stipulated in the relevant regulations/orders of the Commission."

The Sikkim State Electricity Regulatory Commission in exercise of powers conferred under Section 61 and 86 read with Section 181 of the Electricity Act, 2003 (36 of 2003), and all other powers enabling it in this behalf, issued Sikkim State Electricity Regulatory Commission(Terms and Conditions for determination of Tariff for Generation from Renewable Energy Sources) Regulations, 2017vide Notification No. 07/SSERC/TGRE/2012.

Regulation 3 of the above regulations provides as follows:

"These regulations shall apply in all cases where tariffs, for supply of electricity from Renewable Energy Sources and Non-fossil Fuel based co-generating stations to the distribution licenses within the state of Sikkim, is to be determined by the Commission under Section 62 of the Act.

Provided that in cases of wind, small hydro projects, biomass power based on Rankine cycle, non-fossil fuel based cogeneration projects, solar PV, Solar Thermal power projects, Biomass gasifier and Biogas power project, these regulations shall apply subject to the fulfillment of eligibility criteria specified in Regulation 4 of these regulations."

Further, regulation 4(2) defining the eligibility criteria for applicability of the Renewable Energy sources regulations provides that these regulations shall apply to the



Small Hydro Project with installed capacity lower than or equal to 25 MW. The extract of the regulation is reproduced below:

“**Small hydro Project** – located at the sites approved by State Nodal Agency / State Government using new plant and machinery and installed power plant capacity to be lower than or equal to 25 MW at single location.”

1.1 Filing of Tariff proposal for 3 year for the period from FY 2018 -19 to FY 2020-21

The Energy & Power Department, Government of Sikkim owns 11 Small Hydro Projects with installed capacity below 25MW. Accordingly, the E&PDS has submitted the proposal for determination of tariff as per The Sikkim State Electricity Regulatory Commission (Terms and Conditions for determination of Tariff from Renewable Energy Sources) Regulations, 2017.

2. OVERALL APPROACH FOR PRESENT FILING

2.1 Generation Charges for the Period from FY 2018- 19 to 2020-21

E&PDS hereby submits its petition for approval of Generation for the period FY 2018-19, 2019-20 and 2020-21. This petition is being submitted in compliance with the provisions of Renewable Energy Sources Tariff Regulations, 2017. The petitioner has attempted to comply with the various guidelines in the Act and regulations within the limitations of availability of data

E&PDS is filing the petition based on the past performance and expected changes in each element of cost and revenue for the ensuing year. E&PDS has studied the past trends and taken cognizance of other internal and external developments to estimate the likely performance during the period i.e. FY 2018-19, 2019-20 and 2020-21.

2.2 Approach for the Filing

The subsequent sections provide projection for various expenses, the proposed investment plan for the period and the expected revenue projections.

Projections of various cost components required for determination of Aggregate Revenue Requirement along with the rationale for arriving of such cost, the philosophy adopted by E&PDS for projecting generation for the period has been covered in various sections.



For the purpose of projecting the financial & technical parameters, E&PDS has considered its actual performance during FY 2013-14, FY 2014-15, FY 2015-16, FY 2016-17 and FY 2017-18(H1) and the normative parameters prescribed in the Regulations as base and has projected the figures for the period with supporting rationales.

3. AGGREGATE REVENUE REQUIREMENT FOR THE PERIOD FY2018-19, 2019-20 AND 2020-21.

This section outlines the Aggregate Revenue Requirement of the E&PDS for the period i.e. FY 2018-19, 2019-20 & 2020-21, which takes into consideration:

- a) Actual Performance in FY 2013-14, FY 2014-15, FY 2015-16, FY 2016-17;
- b) Estimated Performance for FY 2017-18 based on the Actual performance for the period 01.04.2017 to 30.09.2017;
- c) Projection based on the Actual performance in FY 2013-14, FY 2014-15, FY 2015-16, FY 2016-17 and estimated performance in FY2017-18;
- d) Principles/ Normative Parameters outlined in Tariff Regulations of SSERC.

Past trends have been taken into cognizance in case of certain elements as deemed necessary. The petition has been structured in the following manner:

- SHP details
 - Installed capacity & COD
 - Capital Cost
 - Design Energy
- Proposed Capital Expenditure and capitalization
 - Scheme wise details
 - Capital Expenditure
 - Asset Capitalisation
- Determination of the Aggregate Revenue Requirement
 - Loan & Finance charges
 - Depreciation
 - Return on Equity
 - Interest on Working Capital
 - Operation and Maintenance Expenses



4. DETAILS OF THE SHPS

Details of SHPs are provided in the table below:

Tables 4.1: Details of SHPS

Sl. No.	Name of Station	Installed Capacity (MW)	Date of COD
1	LLHP	12	1980-81
2	JPH	2.1	1962-63
3	Rimbi-I	0.6	1976-77
4	Rimbi-II	1	1986-87
5	Rothak	0.2	1971-72
6	Rongnichu	2.5	1988-89
7	Chaten	1	1990-91
8	Meyongchu	4	1992-93
9	Kalez	2	1995-96
10	Lachung	0.2	1994-95
11	Rabomchu	3	2003-04

4.1 Capital Cost

Regulation 32 of the SSERC (Terms and Conditions for determination of Tariff for Generation from Renewable Energy Sources) Regulations, 2017 provides that the capital cost of Small Hydro Projects shall be determined as per the normative parameters defined in the regulation. The extract of the regulation is reproduced below:

“(1) The normative capital cost for small hydro projects during first year of Control Period (FY 2012-13) shall be as follows:

Sl. No	Project Size	Capital Cost (Rs. in Lakh/MW)
1	Below 5 MW	770
2	5 MW to 25 MW	700

(2) The capital cost for subsequent years shall be revised for projects to be commissioned in each subsequent year linked to capital cost indexation formula as outlined under Regulation 33.”



Further, regulation 33 provides the Capital Cost Indexation Mechanism. The provisions of the regulation are reproduced below:

“The indexed capital cost in case of small hydro projects for each year of the control period shall be notified pursuant to notification of such indexed capital cost for small hydro projects by Central Electricity Regulatory Commission in accordance with indexation mechanism stipulated under CERC RE Tariff Regulations, 2017”.

Regulation 29 of CERC Terms and Conditions for Determination of Tariff for Generation from Renewable Energy Sources Regulations, 2017 provides the following indexation formula based on the Wholesale Price Index for Steel and Electrical Machinery.

$$CC(n) = P\&M(n) * (1+F1+F2+F3)$$

$$P\&M(n) = P\&M(0) * (1+d(n))$$

$$d(n) = [a*\{(SI(n-1)/SI(0)) - 1\} + b*\{(EI(n-1)/EI(0)) - 1\}]/(a+b)$$

Where,

CC(n) = Capital Cost for nth year

P&M(n) = Plant and Machinery Cost for nth year

P&M(0) = Plant and Machinery Cost for the base year

Note. P&M(0) is to be computed by dividing the base capital cost (for the first year of the control period) by (1+F1+F2+F3) i.e.

d(n) = Capital Cost escalation factor for year (n) of Control Period

SI(n-1) = Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period

SI(0) = Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April,2011 to December March,2012

EI(n-1) = Average WPI Electrical Machinery Index prevalent for calendar year



(n-1) of the Control Period

EI(0) = Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April,2011 to December March,2012

a = Constant to be determined by Commission from time to time, (In default it is 0.6), for weightage to Steel Index

b = Constant to be determined by Commission from time to time, (In default it is 0.4), for weightage to Electrical Machinery Index

F1 = Factor for Land and Civil Work (0.16)

F2 = Factor for Erection and Commissioning (0.10)

F3 = Factor for IDC and Financing Cost (0.14)”

Capital cost of the SHPs has been calculated in accordance with the above defined norms & mechanism. The calculation of indexed capital cost is detailed below:

Table 4.2 Indexed Capital Cost

Sl. No.	Factors	Reference Year	Value
i	d(n)	2017-18	
ii	SI(n-1)	2016-17	126.2
iii	SI(0)	2011-12	123.45
iv	EI (n-1)	2016-17	136.6
v	EI (0)	2011-12	129.73
vi	a		0.6
vii	b		0.4
viii	F1+F2+F3		0.4
ix	P&M(0) - Less than 5 MW		550
x	P&M(0) - More than 5 MW		500

$$d(n) = [a \cdot \{(SI(n-1)/SI(0)) - 1\} + b \cdot \{(EI(n-1)/EI(0)) - 1\}] / (a+b)$$

$$[vi \cdot \{(ii/iii) - 1\} + vii \cdot \{(iv/v) - 1\}] / (vi+vii)$$

$$SI(n-1)/SI(0) \text{ or } (ii/iii) = 1.0223$$

$$EI(n-1)/EI(0) \text{ or } (iv/v) = 1.0530$$



*Petition for approval of Generation Tariff for
the period from FY 2018-19 to 2020-21*

$$\begin{aligned} a+b \text{ or } (vii+viii) & 1.0000 \\ vi^{\{(ii/iii)-1\}} & 0.0134 \\ vii^{\{(iv/v)-1\}} & 0.0212 \\ [vi^{\{(ii/iii)-1\}}+vii^{\{(iv/v)-1\}}] & 0.0345 \\ [vi^{\{(ii/iii)-1\}}+vii^{\{(iv/v)-1\}}]/(vi+vii) & 0.0345 \end{aligned}$$

P&M(0) 550

P&M(n) P&M(0)*{1+d(n)}

569.00

CC(n) P&M(n)*(1+F1+F2+F3)

P&M(n)*(1+viii)

796.60

The indexed cost of project per MW for SHPs below 5MW installed capacity, is Rs.
796.60 Lakhs, i.e., 7.97 Crs.

$$\begin{aligned} d(n) & [a^{\{(SI(n-1)/SI(0))-1\}}+b^{\{(EI(n-1)/EI(0))-1\}}]/(a+b) \\ & [vi^{\{(ii/iii)-1\}}+vii^{\{(iv/v)-1\}}]/(vi+vii) \end{aligned}$$

SI(n-1)/SI(0) or (ii/iii) 1.0223

EI(n-1)/EI(0) or (iv/v) 1.0530

a+b or (vii+viii) 1.0000

$vi^{\{(ii/iii)-1\}}$ 0.0134

$vii^{\{(iv/v)-1\}}$ 0.0212

$[vi^{\{(ii/iii)-1\}}+vii^{\{(iv/v)-1\}}]$ 0.0345

$[vi^{\{(ii/iii)-1\}}+vii^{\{(iv/v)-1\}}]/(vi+vii)$ 0.0345



P&M(0) 500

$P\&M(n)P\&M(0)\{1+d(n)\}$

517.27

CC(n) $P\&M(n)\{1+F_1+F_2+F_3\}$

$P\&M(n)\{1+viii\}$

724.18

The indexed cost of project per MW for SHPs above 5MW installed capacity, is Rs. 724.18 Lakhs, i.e., Rs.7.24 Crs.

Accordingly, the Capital Cost for the 11 SHPs is given below.

Table 4.3: Capital Cost

(Rs. Crores)

Sl. No.	Name of Station	Installed Capacity (MW)	Capital Cost
1	LLHP	12	86.90
2	JPH	2.1	16.73
3	Rimbi-I	0.6	4.78
4	Rimbi-II	1	7.97
5	Rothak	0.2	1.59
6	Rongnichu	2.5	19.92
7	Chaten	1	7.97
8	Meyongchu	4	31.86
9	Kalez	2	15.93
10	Lachung	0.2	1.59
11	Rabomchu	3	23.90

5. DETERMINATION OF ANNUAL REVENUE REQUIREMENT

5.1 Loan and Finance Charges

Loan has not been availed by the E&PDS, therefore interest on Loan and Finance charges has been considered as Nil for the purpose of calculating the AFC.



5.2 Depreciation

Depreciation has been calculated in accordance with the regulation 19 of the SSERC (Terms and Conditions for Determination of Tariff for Generation from Renewable Energy Sources) Regulations, 2017. Since, depreciation has not been claimed/allowed earlier in respect of the SHPs, FY 2018-17 has been considered as the 1st year for the purpose of calculating depreciation. The provision in the regulation 19 for charging depreciation for the first 12 years at 5.83% per annum and subsequently by spreading the balance (WDV) over the remaining useful life of the asset has been considered accordingly. The depreciation of the SHPs for the control period is provided below:



Table 5.1: Calculation of Depreciation for FY 2018-19

(Rs.Crores)

Calculation of Depreciation the FY 2018-19									
Sl. No.	Name of Station	Date of COD	Capital Cost	No. of Years since COD	No. of Years for Depreciation	Balance Useful Life	Depreciation /year upto 12th Year	Depreciation from 13th Year	Depreciation for 2018-19
1	LLHP	1980-81	86.90	34	1	34	4.56	1.02	4.56
2	JPH	1962-63	16.73	52	1	34	0.88	0.20	0.88
3	Rimbi-I	1976-77	4.78	38	1	34	0.25	0.06	0.25
4	Rimbi-II	1986-87	7.97	28	1	34	0.42	0.09	0.42
5	Rothak	1971-72	1.59	43	1	34	0.08	0.02	0.08
6	Rongnichu	1988-89	19.92	26	1	34	1.04	0.23	1.04
7	Chaten	1990-91	7.97	24	1	34	0.42	0.09	0.42
8	Meyongchu	1992-93	31.86	22	1	34	1.67	0.37	1.67
9	Kalez	1995-96	15.93	19	1	34	0.84	0.19	0.84
10	Lachung	1994-95	1.59	20	1	34	0.08	0.02	0.08
11	Rabomchu	2003-04	23.90	11	1	34	1.25	0.28	1.25



Table5.2: Calculation of Depreciation for FY 2019-20

(Rs.Crores)

Calculation of Depreciation the FY 2019-20									
Sl. No.	Name of Station	Date of COD	Capital Cost	No. of Years since COD	No. of Years for Depreciation	Balance useful Life	Depreciation /year upto 12th yr	Depreciation from 13th yr	Depreciation for 2019-20
1	LLHP	1980-81	86.90	35	2	33	4.56	1.02	4.56
2	JPH	1962-63	16.73	53	2	33	0.88	0.20	0.88
3	Rimbi-I	1976-77	4.78	39	2	33	0.25	0.06	0.25
4	Rimbi-II	1986-87	7.97	29	2	33	0.42	0.09	0.42
5	Rothak	1971-72	1.59	44	2	33	0.08	0.02	0.08
6	Rongnichu	1988-89	19.92	27	2	33	1.04	0.23	1.04
7	Chaten	1990-91	7.97	25	2	33	0.42	0.09	0.42
8	Meyongchu	1992-93	31.86	23	2	33	1.67	0.37	1.67
9	Kalez	1995-96	15.93	20	2	33	0.84	0.19	0.84
10	Lachung	1994-95	1.59	21	2	33	0.08	0.02	0.08
11	Rabomchu	2003-04	23.90	12	2	33	1.25	0.28	1.25



Table5.3: Calculation of Depreciation for FY 2020-21

(Rs.Crores)

Calculation of Depreciation the FY 2020-21									
Sl. No.	Name of Station	Date of COD	Capital Cost	No. of Years since COD	No. of Years for Depreciation	Balance useful Life	Depreciation /year upto 12th yr	Depreciation from 13th yr	Depreciation for 2020-21
1	LLHP	1980-81	86.90	36	3	32	4.56	1.02	4.56
2	JPH	1962-63	16.73	54	3	32	0.88	0.20	0.88
3	Rimbi-I	1976-77	4.78	40	3	32	0.25	0.06	0.25
4	Rimbi-II	1986-87	7.97	30	3	32	0.42	0.09	0.42
5	Rothak	1971-72	1.59	45	3	32	0.08	0.02	0.08
6	Rongnichu	1988-89	19.92	28	3	32	1.04	0.23	1.04
7	Chaten	1990-91	7.97	26	3	32	0.42	0.09	0.42
8	Meyongchu	1992-93	31.86	24	3	32	1.67	0.37	1.67
9	Kalez	1995-96	15.93	21	3	32	0.84	0.19	0.84
10	Lachung	1994-95	1.59	22	3	32	0.08	0.02	0.08
11	Rabomchu	2003-04	23.90	13	3	32	1.25	0.28	1.25



5.3 Return on Equity

The Fixed Assets of E&PDS are funded through the budgetary support by the Government of Sikkim and Grants and Aids through Financial Institutions under various schemes like RGGVY, APDRP etc. However, in line with the previous orders of the Hon'ble Commission in this regard, Return on Equity has not been considered for computing the ARR for the period.

5.4 Interest on Working Capital

Interest on working capital has been calculated in accordance with the regulation 21 of the SSERC (Terms and Conditions for Determination of Tariff for Generation from Renewable Energy Sources) Regulations, 2017. The Interest on working capital of the SHPs for the control period is provided below:

Table 5.4: Interest on Working Capital for the FY 2018-19

(Rs.Crores)

Calculation of Interest on Working Capital for the FY 2018-19						
Sl. No.	Name of Station	Operation & Maintenance Exp. For one Month	Receivables for two months	Maintenance Spares - 15% of O&M	Total	Interest
		One Month	Two Months	15%		12.80%
1	LLHP	0.25	1.31	0.45	2.01	0.26
2	JPH	0.06	0.28	0.11	0.45	0.06
3	Rimbi-I	0.02	0.08	0.03	0.13	0.02
4	Rimbi-II	0.03	0.13	0.05	0.21	0.03
5	Rothak	0.01	0.03	0.01	0.04	0.01
6	Rongnichu	0.07	0.33	0.13	0.53	0.07
7	Chaten	0.03	0.13	0.05	0.21	0.03
8	Meyongchu	0.12	0.53	0.21	0.86	0.11
9	Kalez	0.06	0.26	0.10	0.43	0.05
10	Lachung	0.01	0.03	0.01	0.04	0.01
11	Rabomchu	0.09	0.40	0.16	0.64	0.08



Table5.5: Interest on Working Capital for the FY 2019-20

(Rs.Crores)

Calculation of Interest on Working Capital for the FY 2019-20						
Sl. No.	Name of Station	Operation & Maintenance Exp. For one Month	Receivables for two months	Maintenance Spares - 15% of O&M	Total	Interest
		One Month	Two Months	15%		12.80%
1	LLHP	0.27	1.34	0.48	2.08	0.27
2	JPH	0.06	0.29	0.12	0.47	0.06
3	Rimbi-I	0.02	0.08	0.03	0.13	0.02
4	Rimbi-II	0.03	0.14	0.06	0.22	0.03
5	Rothak	0.01	0.03	0.01	0.04	0.01
6	Rongnichu	0.08	0.34	0.14	0.56	0.07
7	Chaten	0.03	0.14	0.06	0.22	0.03
8	Meyongchu	0.12	0.54	0.22	0.89	0.11
9	Kalez	0.06	0.27	0.11	0.44	0.06
10	Kalez	0.01	0.03	0.01	0.04	0.01
11	Lachung	0.09	0.41	0.17	0.67	0.09

Table5.6: Interest on Working Capital for the FY 2020-21

(Rs.Crores)

Calculation of Int on Working Capital for the FY 2020-21						
Sl. No.	Name of Station	Operation & Maintenance Exp. For one Month	Receivables for two months	Maintenance Spares - 15% of O&M	Total	Interest
		One Month	Two Months	15%		12.80%
1	LLHP	0.28	1.37	0.51	2.15	0.28
2	JPH	0.07	0.29	0.12	0.48	0.06
3	Rimbi-I	0.02	0.08	0.04	0.14	0.02
4	Rimbi-II	0.03	0.14	0.06	0.23	0.03
5	Rothak	0.01	0.03	0.01	0.05	0.01
6	Rongnichu	0.08	0.35	0.15	0.58	0.07
7	Chaten	0.03	0.14	0.06	0.23	0.03
8	Meyongchu	0.13	0.56	0.23	0.92	0.12
9	Kalez	0.07	0.28	0.12	0.46	0.06
10	Lachung	0.01	0.03	0.01	0.05	0.01
11	Rabomchu	0.10	0.42	0.18	0.69	0.09



5.5 Operation & Maintenance Expenses

Operation and Maintenance Expenses has been calculated in accordance with the regulation 22 of the SSERC (Terms and Conditions for Determination of Tariff for Generation from Renewable Energy Sources) Regulations, 2017 along with amendments. The Operation and Maintenance Expenses of the SHPs for the control period is provided below:

Table5.7: O&M Expenses

(Rs.Crores)

Sl. No.	Name of Station	Capacity (MW)	Normative O&M Expense /MW)	Normative O&M Expense/MW	Escalation Rate / Annum	Escalated O&M Exp				
						At base FY 2012-13	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20
1	LLHP	12	0.18	2.16	5.72%	2.70	2.85	3.02	3.19	3.37
2	JPH	2.1	0.25	0.525	5.72%	0.66	0.69	0.73	0.77	0.82
3	Rimbi-I	0.6	0.25	0.15	5.72%	0.19	0.20	0.21	0.22	0.23
4	Rimbi-II	1	0.25	0.25	5.72%	0.31	0.33	0.35	0.37	0.39
5	Rothak	0.2	0.25	0.05	5.72%	0.06	0.07	0.07	0.07	0.08
6	Rongnichu	2.5	0.25	0.625	5.72%	0.78	0.83	0.87	0.92	0.98
7	Chaten	1	0.25	0.25	5.72%	0.31	0.33	0.35	0.37	0.39
8	Meyongchu	4	0.25	1	5.72%	1.25	1.32	1.40	1.48	1.56
9	Kalez	2	0.25	0.5	5.72%	0.62	0.66	0.70	0.74	0.78
10	Lachung	0.2	0.25	0.05	5.72%	0.06	0.07	0.07	0.07	0.08
11	Rabomchu	3	0.25	0.75	5.72%	0.94	0.99	1.05	1.11	1.17



5.6 Annual Revenue Requirement

The ARR of the SHPs has been arrived at on the basis of the components of tariff as detailed in the previous sections. The table below provides the ARR of 11 SHPs.

Table 5.8: Annual Revenue Requirement for FY 2018-19

(Rs.Crores)

Head of Expense	LLHP	JPH	Rimbi-I	Rimbi-II	Rothak	Rongnichu	Chaten	Meyongchu	Kalez	Lachung	Rabomchu	Total
O&M Expense	3.02	0.73	0.21	0.35	0.07	0.87	0.35	1.40	0.70	0.07	1.05	8.81
Return on Equity	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 Loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation	4.56	0.88	0.25	0.42	0.08	1.04	0.42	1.67	0.84	0.08	1.25	11.50
Interest on Working Capital	0.26	0.06	0.02	0.03	0.01	0.07	0.03	0.11	0.05	0.01	0.08	0.71
Total	7.83	1.67	0.48	0.79	0.16	1.99	0.79	3.18	1.59	0.16	2.38	21.02

Table 5.9: Annual Revenue Requirement for FY 2019-20

(Rs.Crores)

Head of Expense	LLHP	JPH	Rimbi-I	Rimbi-II	Rothak	Rongnichu	Chaten	Meyongchu	Kalez	Lachung	Rabomchu	Total
O&M Expense	3.19	0.77	0.22	0.37	0.07	0.92	0.37	1.48	0.74	0.07	1.11	9.31
Return on Equity	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 Loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation	4.56	0.88	0.25	0.42	0.08	1.04	0.42	1.67	0.84	0.08	1.25	11.50
Interest on Working Capital	0.27	0.06	0.02	0.03	0.01	0.07	0.03	0.11	0.06	0.01	0.09	0.74
Total	8.01	1.71	0.49	0.82	0.16	2.04	0.82	3.26	1.63	0.16	2.45	21.55



Table5.10: Annual Revenue Requirement for FY 2020-21

(Rs.Crores)

Head of Expense	LLHP	JPH	Rimbi-I	Rimbi-II	Rothak	Rongnichu	Chaten	Meyongchu	Kalez	Lachung	Rabomchu	Total
O&M Expense	3.37	0.82	0.23	0.39	0.08	0.98	0.39	1.56	0.78	0.08	1.17	9.85
Return on Equity	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 Loan	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation	4.56	0.88	0.25	0.42	0.08	1.04	0.42	1.67	0.84	0.08	1.25	11.50
Interest on Working Capital	0.28	0.06	0.02	0.03	0.01	0.07	0.03	0.12	0.06	0.01	0.09	0.77
Total	8.21	1.76	0.50	0.84	0.17	2.09	0.84	3.35	1.68	0.17	2.51	22.11



5.7 Summary of Annual Revenue Requirement

The table below provides summary of ARR of the 11 SHPs

Table 5.11: Summary of ARR for SHPs

(Rs.Crores)

Sl. No.	Name of Project	FY 2018-19	FY 2019-20	FY 2020-21
1	LLHP	7.83	8.01	8.21
2	JPH	1.67	1.71	1.76
3	Rimbi-I	0.48	0.49	0.50
4	Rimbi-II	0.79	0.82	0.84
5	Rothak	0.16	0.16	0.17
6	Rongnichu	1.99	2.04	2.09
7	Chaten	0.79	0.82	0.84
8	Meyongchu	3.18	3.26	3.35
9	Kalez	1.59	1.63	1.68
10	Lachung	0.16	0.16	0.17
11	Rabomchu	2.38	2.45	2.51
	Total	21.02	21.55	22.11

6. CAPACITY UTILISATION FACTOR

Capacity Utilisation Factor has been calculated in accordance with the regulation 34 of the SSERC (Terms and Conditions for Determination of Tariff for Generation from Renewable Energy Sources) Regulations, 2017. The extract of the regulation is reproduced below:

“The capacity utilization factor would be considered on the basis of CUF of small hydro projects in the state while approving the tariff. The benchmark capacity utilization factor for small hydro projects shall be 45%.

The normative CUF shall be net of free power to the home State if any, and any quantum of free power if committed by the developer over and above the normative CUF shall not be factored into the tariff.”

Generation of SHP at the CUF of 45% is provided in the table below:



Table 6.1: Total Generation

Sl. No.	Name of Station	Installed Capacity (MW)	Generation at 45% CUF
1	LLHP	12	47.30
2	JPH	2.1	8.28
3	Rimbi-I	0.6	2.37
4	Rimbi-II	1	3.94
5	Rothak	0.2	0.79
6	Rongnichu	2.5	9.86
7	Chaten	1	3.94
8	Meyongchu	4	15.77
9	Kalez	2	7.88
10	Lachung	0.2	0.79
11	Rabomchu	3	11.83

7. AUXILIARY CONSUMPTION

Auxiliary Consumption has been calculated in accordance with the Regulation 35 of the SSERC (Terms and Conditions for Determination of Tariff for Generation from Renewable Energy Sources) Regulations, 2017 along with amendments. The extract of the regulation is reproduced below:

“Normative Auxiliary Consumption for the small hydro projects shall be 1.0%.”

Normative Auxiliary consumption and Net generation is calculated in the table below:

Table 7.1: Normative Auxiliary Consumption

Sl. No.	Name of Station	Generation at 45% CUF	Auxiliary Consumption @1%	Net Generation
1	LLHP	47.30	0.47	46.83
2	JPH	8.28	0.08	8.20
3	Rimbi-I	2.37	0.02	2.34
4	Rimbi-II	3.94	0.04	3.90
5	Rothak	0.79	0.01	0.78
6	Rongnichu	9.86	0.10	9.76
7	Chaten	3.94	0.04	3.90
8	Meyongchu	15.77	0.16	15.61
9	Kalez	7.88	0.08	7.81
10	Lachung	0.79	0.01	0.78
11	Rabomchu	11.83	0.12	11.71



8. GENERATION TARIFF

Generation tariff of the SHPs has been calculated on the basis of the ARR and net generation of the SHPs. Tariff per unit for the 11 SHPs for the FY 2018-19 is provided in the table below:

Table 8.1: Tariff for Generation

Sl. No.	Name of Station	Net Generation	ARR	Tariff
1	LLHP	46.83	7.83	1.67
2	JPH	8.20	1.67	2.04
3	Rimbi-I	2.34	0.48	2.04
4	Rimbi-II	3.90	0.79	2.04
5	Rothak	0.78	0.16	2.04
6	Rongnichu	9.76	1.99	2.04
7	Chaten	3.90	0.79	2.04
8	Meyongchu	15.61	3.18	2.04
9	Lachung	7.81	1.59	2.04
10	Rabomchu	0.78	0.16	2.04
11	Rabomchu	11.71	2.38	2.04

9. ANNUAL REVENUE REQUIREMENT OF THE GENERATION FUNCTION

Total ARR of the Generation function comprising of the 11 SHPs is detailed in the table below:

Table 9.1 ARR of Generation Function

(Rs. Crores)

Sl. No.	Name of Project	FY 2018-19	FY 2019-20	FY 2020-21
1	LLHP	7.83	8.01	8.21
2	JPH	1.67	1.71	1.76
3	Rimbi-I	0.48	0.49	0.50
4	Rimbi-II	0.79	0.82	0.84
5	Rothak	0.16	0.16	0.17
6	Rongnichu	1.99	2.04	2.09
7	Chaten	0.79	0.82	0.84
8	Meyongchu	3.18	3.26	3.35
9	Kalez	1.59	1.63	1.68
10	Lachung	0.16	0.16	0.17
11	Rabomchu	2.38	2.45	2.51
	Total	21.02	21.55	22.11

The Hon'ble Commission is requested to kindly approve the ARR as calculated above.