

**ARUNACHAL PRADESH STATE ELECTRICITY REGULATORY
COMMISSION (APSERC)**

**Determination of Tariff for 3 MW (2 x 1.5 MW)
Sumbachu Small Hydro Projects (SHP), Zemithang,
Tawang, Arunachal Pradesh**

For

**Hydro Power Development Corporation of Arunachal Pradesh Limited
(A Govt. of Arunachal Pradesh Enterprise),
Park view Apartment, Lower Niti Vihar,
Itanagar -791111,
Arunachal Pradesh**

Issued on 16/12/2024

**Arunachal Pradesh State Electricity Regulatory Commission
O. T. BUILDING, T. T. MARG, NITI VIHAR MARKET**

ITANAGAR-791111

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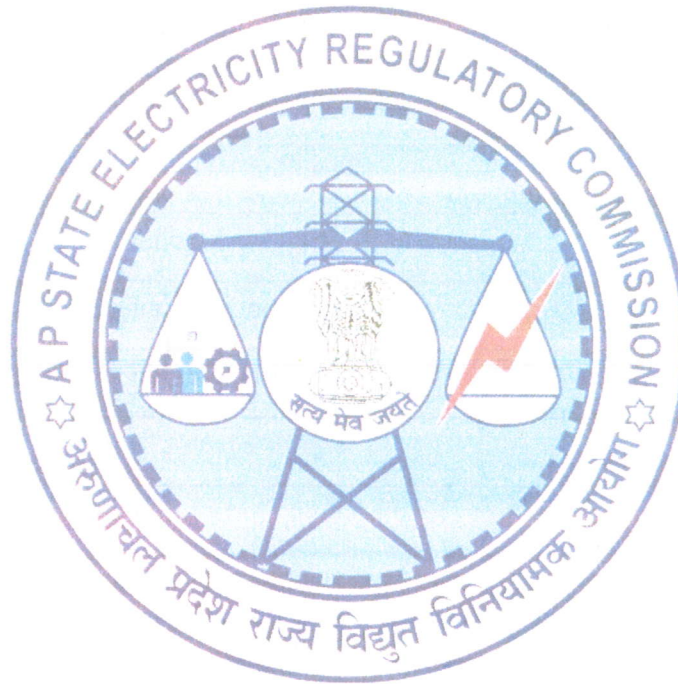
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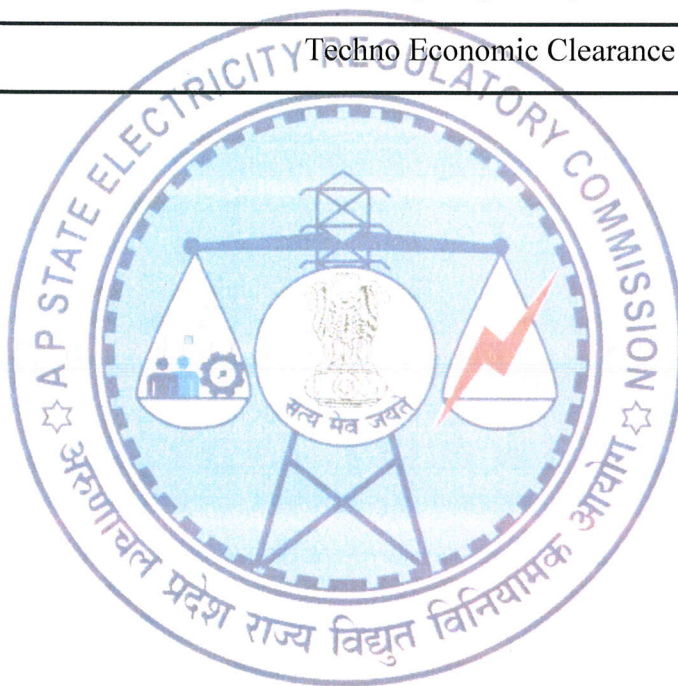


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Abbreviations

Abbreviation	Description
ACT	Electricity Act, 2003
APSERC	Arunachal Pradesh State Electricity Regulatory Commission
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
COD	Commercial Operations Date
Cr./ Crs	Crore/ Crores
D/E	Debt Equity
DOP, AP	Department of Power, Govt. of Arunachal Pradesh
DPR	Detailed Project Report
E&M	Electro-Mechanical
FC	Financial Charges
FY	Financial Year
HEP	Hydro Electric Project
HPDCAPL	Hydro Power Development Corporation Arunachal Pradesh Limited
ICAI	Institute of Chartered Accountants of India
IDC	Interest During Construction
kV	Kilovolt
kVA	Kilo Volt Amps
kWh	Kilo Watt Hour
MU	Million Units
MVA	Million Volt Amps
MW	Mega Watt
O&M	Operation & Maintenance

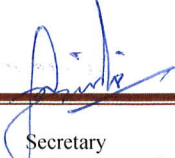
PPA	Power Purchase Agreement
ROE	Return on Equity
Rs.	Rupees
SS	Sub Station
SBI	State Bank of India
SBI-MCLR	State Bank of India- Marginal Cost Lending Rate
SHP	Small Hydro Plant
SERC	State Electricity Regulatory Commission
TEC	Techno Economic Clearance





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The Arunachal Pradesh State Electricity Regulatory Commission (APSERC)

Itanagar, Arunachal Pradesh

Petition No. TP – 08 of 2024

In the matter of:

Determination of Tariff for Sumbachu Small Hydro Projects of 3 MW from date of commercial operation (COD) as per Arunachal Pradesh state electricity regulatory Commission (Terms and Conditions for tariff determination from Renewable energy source) Regulation, 2018 for a period of 35 years.

AND

**M/s Hydro Power Development Corporation of Arunachal Pradesh Limited
(HPDCAPL)**

Park view Apartment, Lower Niti Vihar,

Itanagar -791111,

Arunachal Pradesh

-----Petitioner

VS

Department of Power (DOP),

Govt. of Arunachal Pradesh. Itanagar

-----Respondent

CORAM:

Shri R. K. Joshi, Chairperson

Shri Nich Rika, Member (Law)

ORDER

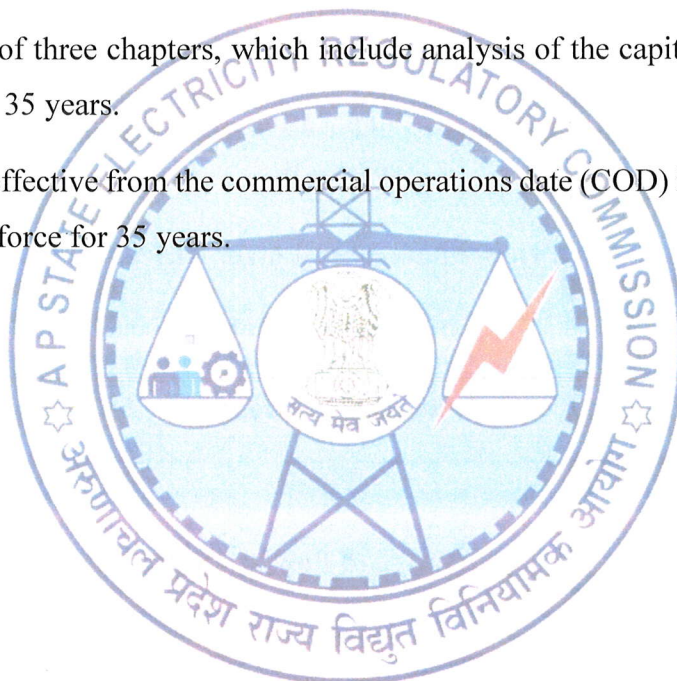
(Passed on 16 December, 2024)

The Commission in exercise of the powers vested in it under section 62 (1) (a) read with Section 62 (3) and Section 64 (3) (a) of the Electricity Act, 2003 and Arunachal Pradesh State Electricity Regulatory Commission (APSERC) RE Regulations, 2018 and other enabling

provisions in this behalf, hereby issues this order, approval of capital cost of the projects and determination of generation tariff for 35 years for supply of power to Department of Power, Govt. of Arunachal Pradesh for distribution in the State of Arunachal Pradesh. The relevant Regulation of the Commission requires that the generating company shall file tariff with the Commission for approval of capital cost and fixation of tariff complete in all respects, along with requisite fee as prescribed in the Commission's Fee, Regulations, (1st amendments) 2017 3 month in advance of date of Commissioning of the project or Commissioning of the 1st unit in case of multiple unit or one month after the date of issuance of these Regulation, whichever is later. Accordingly, the tariff petition has been filed by the HPDCAPL (the deemed generating company).

This order consists of three chapters, which include analysis of the capital cost and approved generation tariff for 35 years.

This order shall be effective from the commercial operations date (COD) i.e. 23rd January 2020 and shall remain in force for 35 years.



S/d-
Shri Nich Rika,
Member (Law)

S/d-
Shri R. K. Joshi
Chairperson

Date: 16 -12 -2024

Place: Itanagar

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State Electricity Regulatory Commission
Arunachal Pradesh

1. INTRODUCTION

1.1 Arunachal Pradesh State Electricity Regulatory Commission

In exercise of the powers conferred by the Electricity Act, 2003, (hereinafter referred to as Act) the Government of Arunachal Pradesh constituted the Electricity Regulatory Commission for the State of Arunachal Pradesh to be known as "Arunachal Pradesh State Electricity Regulatory Commission" (APSERC) as notified on 07.05.2010 (hereinafter referred to as Commission). The Commission so constituted was one-member body initially to function as an autonomous authority responsible for Regulation of the power sector in the State of Arunachal Pradesh. In July 2023, the Commission was restructured into a two-member body, comprising the Chairperson and a Member (Law). The powers and functions of the Commission are such as prescribed in the Act. The office of the Commission is presently located at Itanagar, Arunachal Pradesh. The Commission started functioning with effect from 02.03.2011 with the objectives and purposes for which it has been established.

In accordance with the provisions of the Act, the Commission discharges the following functions:

- a) determines 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) regulates 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) facilitates 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 cogeneration 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 specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee.
- f) adjudicates upon the disputes between the licensees and generating companies; and to refer any dispute for arbitration;
 - g) levy fee for the purpose of the Act;
 - h) specifies State Grid Code consistent with the Grid Code specified under clause (h) of sub-section (1) section 79;
 - i) specify or enforce standards with respect to quality, continuity, and reliability of services 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 EA-2003.
- (1) Further, the Commission also advise the State Government on all or any of the following matters namely:
- a) promotion of competition, efficiency, and economy in activities of the electricity industry.
 - b) promotion of investment in electricity industry.
 - c) reorganization and restructuring of electricity industry in the State.
 - d) matters concerning generation, transmission, distribution and trading of electricity or any other matter referred to the State Commission by the State Government.
- (2) The Commission shall ensure transparency while exercising its powers and discharging its functions.
- (3) In discharge of its functions, the Commission shall be guided by the National Electricity Policy, National Electricity Plan and tariff policy published under section 3 of the Act. The objectives of the tariff policy are to:
- a) ensure availability of electricity to consumers at reasonable and competitive rates.
 - b) ensure financial viability of the sector and attract investments.
 - c) promote transparency, consistency, and predictability in regulatory approaches across jurisdictions and minimize perceptions of regulatory risks.
 - d) promote competition, efficiency in operation and improvement in quality of supply.

1.2 Arunachal Pradesh - Geographical Reality

The total area of the State of Arunachal Pradesh is 83,743 sq. km. The state is situated in the extreme north-east of India and is bounded by independent countries on three sides and

by Assam and Nagaland states on one side. There are Bhutan, China and Myanmar on the west, north and east of this state, respectively, and the Indian states Assam and Nagaland on the south. The State is having a population of around 13.83 lakh (2011 census). Its capital, Itanagar is about 380 km from Guwahati, the capital of Assam.

1.3 Hydro Power Development Corporation of Arunachal Pradesh Limited (HPDCAPL)

Hydro Power Development Corporation of Arunachal Pradesh Limited (A Govt. of Arunachal Pradesh Enterprise) is entrusted with the design and construction of the power projects in the State of Arunachal Pradesh. Hydro Power Development Corporation of Arunachal Pradesh Limited has taken up the development of 3 MW Sumbachu SHP.

Sumbachu small hydel project is located on the sumbachu nallah near Zemithang village in Tawang District of Arunachal Pradesh. The Project site is connected to Tawang by all-weather road which is 90 kms away from Tawang. There is all-weather pucca road between Tawang and Zemithang.

The project area is accessible from Tawang and Zemithang, through all-weather pucca road and through Railway up to Bhalukpong which is 370 kms from Zemithang.

By Road

90 kms from Tawang District Headquarter

430 kms from Tezpur

Nearest Rail Head : Bhalukpong 370 km from site

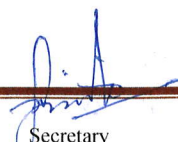
Nearest Airport : Tezpur - 430 kms from Zemithang.

HPDCAPL has successfully commissioned 3 MW Sumbachu SHP on 23.01.2020.

1.4 Tariff Petition: Filing

Hydro Power Development Corporation of Arunachal Pradesh Limited has filed the tariff Petition for 3 MW Sumbachu SHP for 35 years on dated 01.07.2024.

In the petition, HPDCAPL has proposed following as levelized tariff of ₹ 4.91/ kWh based on cost of project of ₹ 3094.29 lakhs and net generation 7.16 MUs of the hydro plant for 35 years.



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1.5 Admission of Petition and Public Hearing Process

- (1) The Petitioner on December 4, 2020, submitted the petition for the determination of tariff for its 3 MW Sumbachu small hydro project.
- (2) The Petitioner has deposited the requisite petition fee in line with schedule of the fees prescribed under the Commission's Fee Regulations 1st amendment 2017, No. APSERC/NOTIFICATION/24/2017 dated 31st March, 2017.
- (3) In the meantime, the Commission experienced a prolonged period of inactivity lasting approximately 3.5 years. During this time, no significant progress was made on pending matters, including HPDCAPL's petition. The Commission resumed full operations on July 18, 2023, following the joining of Chairperson and Member (Legal). Upon scrutinizing the pending petition, the Commission identified a critical omission: the absence of a Power Purchase Agreement (PPA). This deficiency rendered the petition incomplete. Consequently, the Commission returned the petition to HPDCAPL via letter no. APSERC/RA-8/VIII/2023-24/262-63 dated 09.10.2023, instructing the petitioner to provide the required agreement and resubmit.
- (4) On 19.10.2023, Petitioner resubmitted the petition to the Commission, this time including the relevant documents. However, upon scrutiny, several discrepancies were identified, and certain forms were found to be non-compliant with the provisions of the APSERC RE Tariff Regulations, 2018. As a result, the petition was returned once again with instructions to address all shortcomings and resubmit. This was communicated to HPDCAPL via letter no. APSERC/RA-8/VIII/2023-24/333-34 dated 16.11.2023.
- (5) Later on, the Petitioner resubmitted the revised tariff petition on 01.07.2024 with all required documents. The petition was admitted on 04.07.2024 as TP-08-2024. After admission the petition was published in abridged form on dated 19.07.2024 in local newspapers and also placed on Commission's website for public response and suggestions. In this regard the Commission/ HPDCAPL did not receive any written comments/suggestions.
- (6) On 03.09.2024, first hearing was held in the Commission court room where members of HPDCAPL and Department of Power, Govt. of Arunachal Pradesh were present. During the hearing the respondent, Department of power, A.P. informed the Commission that the copy of the petition was not served to them so they were not in position to make any

submission on the claims made by the Petitioner. Therefore, as per the request made by respondent, the Commission directed the petitioner to serve the copies of petition to the respondents and respondents were directed to file their replies within the stipulated time and next hearing date was fixed on 29.10.2024. The Commission also directed Petitioner to clarify some points and submit information on affidavit and also to file its rejoinder with a copy to the respondents.

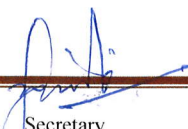
- (7) On 29.10.2024, final hearing on petition was held in the Commission court room where members of HPDCAPL and Department of Power, Govt. of Arunachal Pradesh were present. The Commission have gone through the petition and its supported documents and also from the submissions of the parties in the case.

1.6 Layout of the Order

This order is organized into Three chapters:

- a. **Chapter 1** provides a brief about APSERC, HPDCAPL, some of the details about the tariff setting process, the admission process of petition and about the Hearing.
- b. **Chapter 2** provides petition's summary for approval of capital cost & tariff determination
- c. **Chapter 3** provides Commission analysis and approval of capital cost & tariff.





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2. PETITION'S SUMMARY FOR APPROVAL OF CAPITAL COST & TARIFF DETERMINATION

2.1 Background

HPDCAPL has filed the tariff petition of 3 MW Sumbachu SHP along with the details of various expenses that constitute the fixed cost for determination of tariff. The details are given in the following paras in this chapter.

2.2 Capital Cost - Petitioner's Submission

The Petitioner submitted the Capital cost of the Hydro power plants as per Regulation 12 of APSERC (Terms & Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2018.

The Petitioner has submitted capital cost of ₹ 3094.29 lakhs including financing charges till COD i.e. 23 January 2020.

2.3 Interest On Loan-Petitioner's Submission

The Petitioner submitted that the Project cost of the Sumbachu SHP has been funded by the Government of Arunachal Pradesh. The HPDC has consider the same as grant.

In view of the above, if the Government changes the nature of fund to equity/loan. HPDCAPL shall submit before the Hon'ble Commission for reconsideration of the funding as per the Regulation 16 of the RE Tariff Regulations,2018.

2.4 Return on Equity (RoE) - Petitioner's Submission

The Petitioner submitted that the Project cost of the Sumbachu SHP has been funded by the Government of Arunachal Pradesh. The HPDC has consider the same as grant.

In view of the above, if the Government changes the nature of fund to equity/loan. HPDCAPL shall submit before the Hon'ble Commission for reconsideration of the funding as per the Regulation 16 of the RE Tariff Regulations,2018.

2.5 Depreciation- Petitioner's Submission

The Petitioner has submitted that depreciation for the project has been considered @ 5.28% for first 13 years and @ 0.97% from 14th year till 35th year, considering salvage value as 10 % as per Regulation 15 of APSERC RE Regulation, 2018.

Calculation of Depreciation							(₹ in Lakhs)
Sl. No.	Name of Station	Date of COD	Capital Cost	No. of Years since COD	Balance Useful Life	Depreciation /year up to 13th Year	Depreciation from 14th Year
1	Sumbachu SHP	23.01.2020	3094.29	0	35	163.38	30.04

2.6 O&M Expenses – Petitioner's Submission

The Petitioner submitted O&M expenses as per Regulation 19 of APSERC RE Regulations, 2018 that provides normative O&M for SHPs as ₹38.06 lakh/MW for the base year of 2018-19. The Regulation further provides an escalation @ 5.72% per annum on the above normative O&M for subsequent years.

Sl. No.	Name of Station	Capacity (MW)	Normative O&M Expense /MW)	Normative O&M Expense/MW At base FY 2019-20	Escalation Rate / Annum
1	Sumbachu SHP	3.00	40.24	120.71	5.72%

2.7 Interest on Working Capital - Petitioner's Submission

The Petitioner submitted interest on Working Capital as per Regulation 17 of APSERC RE Regulations, 2018. Interest @ 10.53 % per annum on working capital has been considered as 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 7.53%.

1. Operation & Maintenance expenses for one month;

2. Receivables equivalent to 2 months of energy charges for sale of electricity;
3. Maintenance spares @ 15% of O&M expense.

2.8 Capacity Utilisation Factor (CUF) - Petitioner's Submission

Clause 27 of the RE Regulations 2018, provides that CUF for the small hydro projects shall be 45%.

In this regard, the petitioner submitted that the Sumbachu Small Hydel Project is located on the Sumbachu Nallah near Zemithang village in Tawang District of Arunachal Pradesh & is dependent on the water discharge for generation. The load factor achieved by the plant in past few years of its operation is in the range of 20% to 25%. The low generation is mainly on account of non-availability of discharge especially during the winter season. Hence, it may not be possible to achieve CUF 45% as prescribed for small hydro projects in Clause 27 of the RE Regulations 2018. Accordingly, HPDCAPL has considered CUF of 27.50% for proposing the tariff.

2.9 Subsidy & Incentive by Central/ State Govt. - Petitioner's Submission


The petitioner has received grant of ₹20.37 crore from Planning Commission as special plan assistance (SPA). And ₹6.56 crore received from MNRE as Central Financial Assistance (CFA) and the remaining cost of the project has been funded by the Government of Arunachal Pradesh. So the Project is totally funded by the Government as subsidy and incentive by central /state Govt.

2.10 Auxiliary Consumption- Petitioner's Submission

As per Regulation 28 of APSERC Regulation 2018, normative auxiliary consumption factor is taken @ 1% of net CUF.

2.11 Indicative Tariff - Petitioner's Submission

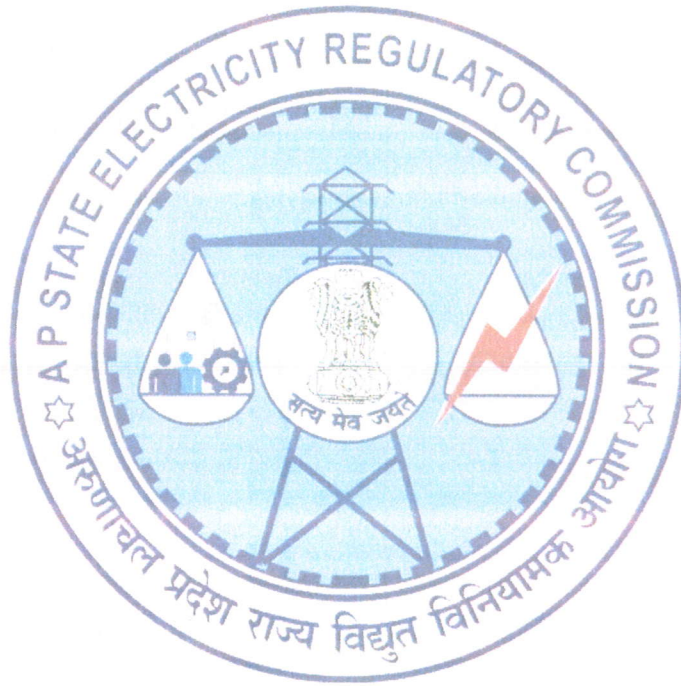
The Petitioner submitted levelized tariff considering 45 % CUF as ₹ 4.91/Kwh.


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2.12 PETITIONER'S PRAYER

The Petitioner respectfully prayed that the Hon'ble Commission may be pleased to:

- (a) Approve the Capital cost, Annual Fixed Charges & Tariff as submitted in Para 2 & 3
- (b) Relax the CUF as proposed
- (c) Pass such other and further order(s) as are deemed fit and proper in the facts and circumstances of the case.



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3. COMMISSION ANALYSIS: APPROVAL OF CAPITAL COST & TARIFF

The Commission hereby analyse the capital cost and determine tariff as per Regulation (7) & (8) of APSERC RE Regulation, 2018 after detailed scrutiny and considering reasonable, logical, acceptable facts presented by petitioner.

3.1 Assumptions for Tariff Petition Analysis.

The Commission considered the following assumption for tariff analysis.

Table 1: The Assumptions considered for Tariff Petition Analysis

Sl. No.	Particulars	Unit	Value	Remarks
1	Auxiliary Consumption	%	1	As per APSERC RE Regulation, 2018
2	O&M Expenses	Lakhs/ MW	40.24	Escalation @5.72% as per APSERC RE Regulation, 2018
3	Depreciation	%	5.28%	For 13 years as per APSERC RE Regulation, 2018
4	Plant Life	Years	35	As per APSERC RE Regulation, 2018
5	Salvage value	%	10	As per APSERC RE Regulation, 2018
6	Capacity Utilization Factor	%	45	As per APSERC RE Regulation, 2018
7	RoE	%	14	As per APSERC RE Regulation, 2018 and gross up post tax @ 20.46%
8	Interest on working capital	%	11.14	300 base point above SBI MCLR as per APSERC RE Regulation, 2018
10	Interest on Loan	%	10.14	200 base point above SBI MCLR as per APSERC Regulation, 2018
11	Spares(% of O&M)	%	15	As per APSERC RE Regulation, 2018
12	O&M expenses	Months	1	As per APSERC RE Regulation, 2018
13	Receivables	Months	2	As per APSERC RE Regulation, 2018
14	Debt	%	70	As per APSERC RE Regulation, 2018
15	Equity	%	30	As per APSERC RE Regulation, 2018
16	Loan Period	Years	13	As per APSERC RE Regulation, 2018

3.2 Capital Cost – Commission Analysis

The Petitioner has incurred a capital expenditure of ₹3094.29 lakh for the project as of the date of commercial operation, i.e., January 20, 2020. The actual capital cost per MW is calculated to be ₹10.31 crore/MW. The details of capital expenditure are as follows:

Table 2: Detailed capital expenditure claimed

Summary of Capital Cost		
Sl. No.	Particulars	Cost (₹ in lakhs)
1	Civil works	1540.39
2	Design & Eng. Drawing etc.	35.54
3	Survey & Investigation	15.50
4	ELECT. & MECH.	1351.79
5	Others	151.08
6	TOTAL	3094.29

During the scrutiny of the petition, the Commission observed that the entire project cost incurred during the development of the project was funded by the State Government and the Central Government. Initially, as per the original Detailed Project Report (DPR), the project cost was estimated at ₹20.37 crore (Rupees Twenty Crore and Thirty-Seven Lakh only). However, due to actual site requirements, the DPR was revised, resulting in an updated estimated cost of ₹30.35 crore (Rupees Thirty Crore and Thirty-Five Lakh only).

In December 2010, the Petitioner received a grant of ₹20.37 crore under the Original DPR through the Prime Minister's Package from the Planning Commission, Government of India, as Special Plan Assistance (SPA). To bridge the funding gap of ₹9.98 crore for the project, the Petitioner approached the Ministry of New and Renewable Energy (MNRE), Government of India, in October 2013. Subsequently, the MNRE, through its sanction letter no. 6/03/2013-SHP dated December 24, 2014, approved ₹6.56 crore (Rupees Six Crore Fifty-Six Lakh Forty Thousand only) as Central Financial Assistance (CFA). The remaining amount, not exceeding ₹3.44 crore (Rupees Three Crore Forty-Four Lakh only), was funded by the Government of Arunachal Pradesh, as confirmed in letter no. PWRS/ESTT-82/2017-18(HPDC). Therefore, the project is entirely funded through subsidies and incentives provided by the Central and State Governments.

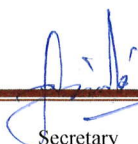
Details of Funding's

Date of receipt of Grant	Source of Grant	Amount received (₹. in lakh)
15.2.2010	P.M Package	2037.00
31.12.2014	MNRE, Govt. of India	300.00
30.09.2016		229.74
03.01.2023		126.66
17.05.2018	State Plan Govt. of A.P, Gap funding	344
Total		3037.4

The Commission after considering the petitioner's submissions, briefing during hearing and respondent's submissions approve the capital cost of the 3 MW Sumbachu SHP as ₹30.94 crore. Though it does not get passed through into tariff being a grant by Government.

Detail of Capital Expenditure Approved is as Follows:**Table 3 : Detail of capital expenditure approved**

Sl. No.	Head of Expense	Claimed by Petitioner (₹. in lakh)	Cost allowed by APSERC (₹. in lakh)
1	Civil works	1540.39	1540.39
2	Design & Eng. Drawing etc.	35.54	35.54
3	Survey & Investigation	15.50	15.50
4	ELECT. & MECH.	1351.79	1351.79
5	Others	151.08	151.08
6	TOTAL	3094.29	3094.29



3.4. Return On Equity

(a) Petitioner's submission

The Petitioner submitted that the Project cost of the Sumbachu SHP has been funded by the Government of Arunachal Pradesh. The HPDCAPL has consider the same as grant.

In view of the above, if the Government changes the nature of fund to Equity/Loan. HPDCAPL shall submit before the Hon'ble Commission for reconsideration of the funding as per the Regulation 16 of the RE Tariff Regulations,2018.:

(b) Commission's Analysis

Here all funding comes from the State Government/Central Government as a grant without any obligation to pay back. Hence there is no shareholder/equity. As a result, return on equity capital does not arise.

In line with the Petitioner's submissions, the Commission does not approve any return on equity for the project.

3.5. Interest On Loan Capital

(a) Petitioner's submission

The Petitioner submitted that the Project cost of the Sumbachu SHP has been funded by the Government of Arunachal Pradesh. The HPDCAPL has considered the same as grant.

In view of the above, if the Government changes the nature of fund to Equity/Loan. HPDCAPL shall submit before the Hon'ble Commission for reconsideration of the funding as per the Regulation 16 of the RE Tariff Regulations,2018.

(b) Commission's Analysis

Here all funding comes from the State Government/Central Government as a grant without any obligation to pay back. Hence, the Petitioner has not taken any loan. As a result, interest on loan on capital does not arise. Accordingly, no interest on loan on Capital is being claimed for the project.

In view of the above submissions no interest on loan and finance charges are approved for the project.

3.6. Depreciation

(a) Petitioner's submission

The Petitioner has submitted that depreciation for the project has been considered @ 5.28% for first 13 years and @ 0.97% from 14th year till 35th year, considering salvage value as 10 % as per Regulation 15 of APSERC RE Regulation, 2018.

Calculation of Depreciation							(₹ Lakhs)
Sl. No.	Name of Station	Date of COD	Capital Cost	No. of Years since COD	Balance Useful Life	Depreciation /year up to 13th Year	Depreciation from 14th Year
1	Sumbachu SHP	23.01.2020	3094.29	0	35	163.38	30.04

(b) Commission's Analysis

Here all funding comes from the State Government/Central Government as a grant without any obligation to pay back. The Petitioner has claimed depreciation as the assets are created from the subsidies or grants of Government of Arunachal Pradesh or Government of India.

Regarding treatment of Grant, it may be observed that as per the Accounting Standards 12 of Institute of Chartered Accountants of India (ICAI), the principle for treatment of grants is laid as under:

“Government grants related to specific fixed assets should be presented in the balance sheet by showing the grant as a deduction from the gross value of the assets concerned in arriving at their book value. Where the grant related to a specific fixed asset equals the whole, or virtually the whole, of the cost of the assets, the asset should be shown in the balance sheet at a nominal value. Alternatively, government grant related to depreciable fixed assets may be treated as deferred

income which should be recognized in the profit and loss statement on a systematic and rational basis over the useful life of the asset, i.e., such grant should be allocated to income over the periods and in the proportion in which depreciation on those assets is charges.”

The Commission further observes that the ICAI standard provides two options for accounting for grants attributable to specific assets:

First Method: Deduct the grant amount from the gross block of the asset, and calculate depreciation on the reduced gross block.

Second Method: Calculate depreciation on the total gross block, but treat an amount equivalent to the depreciation related to the grant-funded portion as income in the Profit and Loss Account. This amount would then be deducted from the tariff.

In the case of this project, as no assets have been created by the licensee using its own equity or capital and the entire funding has been provided through government grants or aid, the Commission concludes that no depreciation is allowable for the project.

3.7. O&M Expenses

(a) Petitioner's submission

The Petitioner submitted O&M expenses as per Regulation 19 of APSERC RE Regulations, 2018 that provides normative O&M for SHPs as ₹38.06 Lakh/MW for the base year of 2018-19. The Regulation further provides an escalation @ 5.72% per annum on the above normative O&M for subsequent years.

Sl. No.	Name of Station	Capacity (MW)	Normative O&M Expense /MW)	Normative O&M Expense/MW	Escalation Rate / Annum
				At base FY 2019-20	
1	Sumbachu SHP	3.00	40.24	120.71	5.72%

(b) Commission's Analysis

The Commission allowed the operation and maintenance costs considering the normative rate as ₹38.06 Lakhs per MW with per annum escalation @ 5.72 % (for plants below 5 MW) as per APSERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations-2018.

The Commission in a view to allow O&M costs for FY 2019-2020 as first year of operations in accordance with APSERC RE Regulation, 2018 and hence approved the O&M cost during the project life as shown in Annexure A & B.

3.8. Interest on Working Capital

(a) Petitioner's submission

The Petitioner submitted interest on Working Capital as per Regulation 17 of APSERC RE Regulations, 2018. Interest @ 10.53 % per annum on working capital has been considered as 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 7.53%.

1. Operation & Maintenance expenses for one month;
2. Receivables equivalent to 2 months of energy charges for sale of electricity;
3. Maintenance spares @ 15% of O & M expense

(b) Commission's Analysis

The Commission has computed Interest on Working Capital as per APSERC RE Regulations, 2018 according to which the working capital for SHPs would be sum total of:

1. O&M expenses for one month.
2. Maintenance spares @15% of O&M expenses.
3. Receivables equivalent to two months of energy charges for sale of electricity calculated on the normative Capacity Utilization Factor

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. Here for calculation of Interest rate the Commission has considered the average State Bank of India MCLR (One Year Tenor) prevalent during the last six months during the FY 2019-20 as shown below in table.

Month (FY 2019-20)	1 year Tenor-wise MCLR Rates (Source: SBI Monthly Press Releases)
Oct-19	8.05%
Nov-19	8.00%
Dec-19	7.90%
Jan-20	7.90%
Feb-20	7.85%
Mar-20	7.75%
Avg. for last Available 6 months	7.91%
Interest on Working Capital shall be computed at 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.	
	10.91%

The Commission approved Interest on Working Capital during the project life as shown in Annexure A & B.

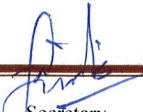
3.9. Discounting Factor - Commission analysis

The discounting factor considered is equal to the post tax weighted average cost of capital on basis of normative debt: equity ratio as per Regulation 2018. The discount rate works out to be 9.12 %. (*considering Income tax rate @ 29.12% (25% Corporate rate+ 12% surcharge +4% Education cess).*)

3.10. Capacity Utilization Factor (CUF)

(a) Petitioner's submission

Clause 27 of the RE Regulations 2018, provides that CUF for the small hydro projects shall be 45%.


 Secretary
 State Electricity Regulatory Commission
 Arunachal Pradesh

In this regard, the petitioner submitted that the Sumbachu Small Hydel Project is located on the Sumbachu Nallah near Zemithang village in Tawang District of Arunachal Pradesh & is dependent on the water discharge for generation. The load factor achieved by the plant in past few years of its operation is in the range of 20% to 25%. The low generation is mainly on account of non-availability of discharge especially during the winter season. Hence, it may not be possible to achieve CUF 45% as prescribed for small hydro projects in Clause 27 of the RE Regulations 2018. Accordingly, HPDCAPL has considered CUF of 27.50% for proposing the tariff

(b) Commission's Analysis

As per Clause 27 of the RE Regulations 2018, provides that

"CUF for the small hydro projects shall be 45%.

Explanation: For the purpose of this Regulation, normative CUF is 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."

As detailed in the Detailed Project Report (DPR) dated January 2009, Clause 4.3 specifies a projected Capacity Utilization Factor (CUF) of 65%. Additionally, the Techno-Economic Review Report prepared by AHEC, IIT Roorkee, in November 2018, recorded CUF values of 60% and 70%.

The Commission is of the view that DPR was prepared with detailed analysis of hydrology and it cannot go to such huge change in few years' period. So the deviation from the regulation norms is not justified. Therefore, for the calculation of tariff the CUF shall be taken as per regulation i.e. 45%.

However, The Commission here advises the petitioner that if due to some constraints if there is low generation then the petitioner shall claim the benefit under the **"Must Run"** status as per the Electricity (Promotion of Generation of Electricity from Must-Run Power Plant) Rules, 2021 and its amendment.



Secretary
State Electricity Regulatory Commission
Arunachal Pradesh

3.11. Hydro Power Generation Tariff - Commission's Analysis

Regulation 28 of the APSERC Regulation on “The Terms and Conditions for Determining of Tariff Determination from Renewable Energy Sources – 2018” dated 21.05.2018 specifies the Auxiliary Energy Consumptions Norms of Operation in respect of the Hydro Plants at 1 % for SHPs.

The Commission in its tariff order has reasonably considered CUF of 45% net of free power to the state for SHP as per the APSERC RE Regulation 2018.

The net saleable energy after considering CUF and auxiliary consumption comes out to be 11.72 MUs.

Hence, the Commission approves the generation levelized tariff for Sumbachu Small Hydro Plant for 35 years at ₹ 2.02 (Rs. /kWh).

The detailed calculation is attached as **Annexure A & B**.

- The tariff allowed in this order shall be applicable from the date of commercial operations of 3 MW Sumbachu SHP.
- The provisional tariff considered in the PPA shall be subject to adjustment.
- The plant shall be on “**MUST Run**” basis.

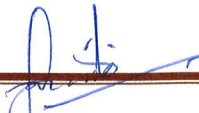
Accordingly, the Petition TP-08-of 2024 is disposed of.

S/d-
Shri Nich Rika,
Member (Law)

S/d-
Shri R. K. Joshi
Chairperson

Date: 16 -12 -2024

Place: Itanagar


Secretary
State Electricity Regulatory Commission
Arunachal Pradesh



Secretary
State Electricity Regulatory Commission
Arunachal Pradesh

Annexure-A: Assumption Sheet - Commissions Analysis – Tariff Calculation

Sumbachu Small Hydro Projects (2 x 1.5 MW)					Annexure
Small Hydro: Assumptions Parameters					
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	HPDCAPL
				COD	23-01-2020
			Installed Power Generation Capacity	MW	3
			Capacity Utilization Factor	%	45.0%
			Auxiliary Consumption	%	1%
			Useful Life	Years	35
2	Project Cost	Capital Cost	Power Plant Cost	Rs Lacs	3094.29
			Capital Subsidy (if any)	Rs Lacs	3094.29
			Net Capital Cost	Rs Lacs	0.00
3	Period		Tariff Period	Years	35
		Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	0.00
			Total Equity Amount	Rs Lacs	0.00
4	Sources of Fund	Debt Component	Loan Amount	Rs Lacs	0.00
			Moratorium Period	years	0
			Repayment Period (including Moratorium)	years	13
			Interest Rate	%	9.91%
		Equity Component	Equity amount	Rs Lacs	0.00
			Return on Equity for Project Life	% p.a	17.60%
			Discount Rate		9.12%
5	Financial Assumptions		Income Tax	%	29.12%
		Depreciation	Allowed Depreciation	%	90%
			Depreciation Rate for first 13 years	%	5.28%
			Depreciation Rate 14th year onwards	%	0.97%
6	Working Capital	For Fixed Charges			
		O&M Charges		Months	1
		Maintenance Spare	(% of O&M expenses)		15%
		Receivables for Debtors		Months	2
		Interest On Working Capital		%	10.91%
7	Operation & Maintenance	O&M Expenses (2019-20)		Rs Lacs	40.24
		Total O & M Expenses Escalation		%	5.72%
8	Generation and Sale Of Energy	Total No. of Hours		Hrs	8766

Interest rate:

Month	1 year Tenor-wise MCLR Rates (Source: SBI Monthly Press Releases)
Oct-19	8.05%
Nov-19	8.00%
Dec-19	7.90%
Jan-20	7.90%
Feb-20	7.85%
Mar-20	7.75%
Avg. for last Available 6 months	7.91%
Interest on loan Interest Rate of two hundred (200) basis points above the average State Bank of India MCLR (One-year Tenor) prevalent during the last available six months of the relevant year of the Control Period for the determination of tariff.	9.91%
Interest on Working Capital shall be computed at 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.	10.91%

Mat rate:

1st April 2019 mat rate	20.46%	
category		
< 1cr	19.24	4% cess
1-10 cr	20.59	4% cess + 7% surcharge
>10 cr	21.55	4% cess + 12% surcharge
Avg.	20.46	

Annexure -B- Detailed Calculation Sheet for Sumbachu SHP:

RE Tariff (SHP)																																						
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		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Gross Generation	MU		1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183	1183
Auxiliary Consumption	MU		0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Net Generation	MU		1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172	1172

Fired 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
CO&M Expenses	Rs Lakh		121.71	127.62	134.92	142.63	150.79	159.42	168.54	178.18	188.37	199.14	210.53	222.57	235.31	248.77	262.99	278.04	293.94	310.76	328.53	347.32	367.19	388.19	410.40	433.87	458.89	484.93	512.69	541.99	572.99	605.77	640.42	677.05	715.77	756.72	800.00
Depreciation	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
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
Interest on working Capital	Rs Lakh		5.36	5.67	6.00	6.34	6.70	7.08	7.49	7.92	8.37	8.85	9.36	9.89	10.46	11.06	11.69	12.36	13.06	13.81	14.60	15.44	16.32	17.25	18.24	19.28	20.38	21.55	22.78	24.09	25.46	26.92	28.46	30.09	31.81	33.63	35.55
Return on Equity	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	
Total Fired Cost	Rs Lakh		126.08	133.29	140.91	148.97	157.49	166.50	176.02	186.09	196.74	207.99	219.89	232.47	245.76	259.82	274.68	290.39	307.01	324.57	343.13	362.76	383.51	405.44	428.64	453.15	479.07	506.48	535.45	566.08	598.46	632.69	668.88	707.14	747.58	790.35	835.55

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
CO&M expn	Rs/kWh		1.03	1.09	1.15	1.22	1.29	1.36	1.44	1.52	1.61	1.70	1.80	1.90	2.01	2.12	2.24	2.37	2.51	2.65	2.80	2.96	3.13	3.31	3.50	3.70	3.92	4.14	4.38	4.63	4.89	5.17	5.47	5.78	6.11	6.46	6.83
Depreciation	Rs/kWh		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 term loan	Rs/kWh		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/kWh		0.05	0.05	0.05	0.05	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.09	0.09	0.10	0.11	0.11	0.12	0.12	0.13	0.14	0.15	0.16	0.16	0.17	0.18	0.19	0.21	0.22	0.23	0.24	0.26	0.27	0.29	0.30
RoE	Rs/kWh		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
Total COG	Rs/kWh		1.08	1.14	1.20	1.27	1.34	1.42	1.50	1.59	1.68	1.78	1.88	1.98	2.10	2.22	2.34	2.46	2.62	2.77	2.93	3.10	3.27	3.46	3.65	3.87	4.09	4.32	4.57	4.83	5.11	5.40	5.71	6.04	6.39	6.75	7.13

Discount Factor		1.00	0.94	0.77	0.705	0.646	0.592	0.543	0.498	0.456	0.418	0.383	0.351	0.322	0.295	0.270	0.248	0.227	0.208	0.191	0.175	0.160	0.147	0.134	0.123	0.113	0.103	0.095	0.087	0.080	0.073	0.067	0.061	0.056	0.051	0.047	
Discounted Tariff		1.076	0.956	0.926	0.897	0.869	0.842	0.816	0.790	0.766	0.742	0.719	0.697	0.675	0.654	0.633	0.614	0.595	0.576	0.558	0.541	0.524	0.508	0.492	0.477	0.462	0.447	0.433	0.420	0.407	0.394	0.382	0.370	0.359	0.347	0.337	
Levelised Tariff	Rs/Unit	2.02																																			

