# Meghalaya State Electricity Regulatory Commission

# Approval of the Generation Tariff for Ganol Small Hydro Project (3x7.5 MW) 22.5 MW

# For

# Meghalaya Power Generation Corporation Limited

**MEGHALAYA STATE ELECTRICITY REGULATORY COMMISSION**
1ST Floor (Front Block Left Wing), New Administrative Building
Lower Lachumiere, **Shillong-793001**
East Khasi Hills District, Meghalaya

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# ABBREVIATIONS

| | |
|---|---|
| A&G | Administration & General |
| ARR | Aggregate Revenue Requirement |
| APTEL | Appellate Tribunal For Electricity |
| CoD | Commercial Operation Date |
| CERC | Central Electricity Regulatory Commission |
| CGS | Central Generating Stations |
| CoS | Cost of Supply |
| CWIP | Capital Work In Progress |
| DE | Debt Equity |
| EHT | Extra High Tension |
| FY | Financial Year |
| GOM | Government of Meghalaya |
| GFA | Gross Fixed Assets |
| HT | High Tension |
| KV | Kilo Volt |
| KVA | Kilo Volt Amps |
| KVAh | Kilo Volt Ampere hour |
| KW | Kilo Watt |
| kWh | kilo Watt hour |
| LT | Low Tension |
| MVA | Million Volt Amps |
| MU | Million Unit |
| MW | Mega Watt |
| MYT | Multi Year Tariff |
| MeECL | Meghalaya Energy Corporation Limited |
| MePGCL | Meghalaya Power Generation Corporation Limited |
| MePDCL | Meghalaya Power Distribution Corporation Limited |
| MePTCL | Meghalaya Power Transmission Corporation Limited |
| MSERC | Meghalaya State Electricity Regulatory Commission |
| ROE | Return on Equity |
| SLDC | State Load Despatch Centre |

# MEGHALAYA STATE ELECTRICITY REGULATORY COMMISSION

**1ST Floor (Front Block Left Wing), New Administrative Building**
**Lower Lachumiere, Shillong-793001**
**East Khasi Hills District, Meghalaya**

**CASE NO. 1/2024**

**In the Matter of**

Approval of generic tariff for Ganol small hydro project (3x7.5 MW = 22.5MW) of MePGCL under regulation 11 of MSERC (Terms and Conditions for determination of tariff for generation from renewable energy sources) Regulations, 2014 and under Section 62 read with Section 86 of the Electricity Act 2003.

**AND**

Meghalaya Power Generation Corporation Limited……..**the Petitioner**

(here in after referred to as MePGCL)

**Coram**

P W Ingty, IAS (Retd.)

**Chairman**

R.K. Soni, District Judge (Retd.)

**Member**

## ORDER

(Date:13.03.2024)

**1)** Meghalaya Power Generation Corporation Limited (herein after referred to as MePGCL), engaged in the business of Generation of Electricity in the state of Meghalaya.

**2)** The Meghalaya Power Generation Corporation Limited (MePGCL) has been entrusted with the development of (3x7.5) 22.5 MW Ganol Small Hydro Electric Power Project in Garo Hills district of Meghalaya. The Ganol project is a run of the river scheme with installation of (3x7.5) 22.5 MW Power station on the Ganol River, also called Kalu River having/ joined by a tributary of the Rongram river.

**3) Administrative Approval**

Govt. of Meghalaya has accorded Administrative Approval for setting up of 3x7.5=22.5 MW Ganol Small Hydro Project vide letter no. PE.129/2005/122 dated 13th May 2008 under non lapsable central pool resources as per Funding Pattern as follows.

| | | |
|---|---|---|
| 1 | Completion Cost | Rs.177.52 Cr |
| 2 | Equity from DONER | Rs.53.30 Cr |
| 3 | Subsidy from MNRE | Rs.16.81 Cr |
| 4 | Loan from NABARD/REC | Rs.107.41 Cr |

**4) Project Cost**

The petitioner has filed Project cost as per 2019 price level for Rs.507.71 Crore.

Petitioner has also submitted Audit certificate for the revised Cost estimate for Rs.507.71 Crore as on 31st July 2020.

**5) Forest Clearance**

Earlier, the Garo Hills district council Tura, has issued No Objection Certificate for implementation of Construction of 25 MW Ganol HEP for Power Generation in Meghalaya State vide their Memo no.CF.416/NoC/2005/3233-25,Tura dated 19th December 2006.

**6) Environmental Clearance**

The Government of India, Ministry of Environment and Forests, New Delhi in their letter dated 15.02.2007 has stated that, as per New EIA notification 2006, Hydro Electric Projects below 25 MW does not require Environmental Clearance.

**7) Filing of the Petition**

MePGCL has filed Petition for Determination of Generic Tariff for Ganol Small Hydro Project (3x7.5) 22.5 MW on 12.01.2024 as per Regulation 4 of MSERC (Terms and conditions for determination of Tariff for Generation from Renewable Energy Sources) Regulations 2014 read with first Amendment dated 23rd June, 2022.

**8) Date of Commissioning:**

MePGCL has submitted that date of Project commissioning was achieved on 01.08.2023 as per the Board Resolution no.06 dated 20.12.2023.

**9) Statutory Auditors M/s SBA Associates, Kolkata**

The Statutory Auditors disclosed in their certification dated 28.09.2023 that administrative approval from Govt. of Meghalaya is pending.

The Statutory Auditors in their report have disclosed the cost incurred as on 31.07.2020 was Rs.507.71 Crore (including IDC).

**10) Generic Tariff**

**Regulation 11 of MSERC RE Regulations 2014 specifies**

***1) Generic tariff shall be determined on the petition filed by eligible RE generator for such renewable energy technologies indicated in Regulation 4.***

***2) The Generic Tariff would be based on normative parameters as per the norms specified in these regulations for each type of renewable energy source and the year of commissioning of the plant.***

***3) The tariff determined being normative, no true up of any parameter, including additional capitalization, for what so ever reasons shall be taken up during the validity of the tariff; any short fall or gain due to performance or other reasons is to be borne / retained by the RE based generating stations*.**

**11) Commission's Order**

In exercise of functions vested under Section 86 of Electricity Act 2003 read with MSERC (Terms and conditions for determination of Tariff for Generation from Renewable Energy Sources) Regulations 2014, read with first Amendment dated 23rd June 2022, Commission after Prudence check of the petition with reference to the cost estimate, auditor's certification as on 31.07.2020, and also hearing the suggestions and objections from stakeholders, issues Generation tariff order under RE Regulations for **(3x7.5) 22.5 MW Ganol Small Hydro Project**.

The RE Tariff Shall be applicable from 01.04.2024. The levelised Tariff for 40 years of the life time of the project is notified in this Order.

| | |
|---|---|
| Sd/- | Sd/- |
| **Shri. R.K. Soni, District Judge(Retd.)** | **Shri. P.W.Ingty, IAS(Retd.)** |
| **(Member)** | **(Chairman)** |

# 1. Introduction

## 1.1 Introduction

The Project area lies in the Garo Hills district of Meghalaya and is in the heart of the district, very close to Tura (7 km to the west of Tura town), the district headquarters. Ganol Small Hydro Project is a runoff the river scheme with installation of (3x7.5) 22.5 MW Power station on the Ganol River, also called the Kalu river having / joined by a tributary of the Rongram river.

MePGCL has submitted Petition on 12.1.2024 for approval of the Generic Tariff for (3x7.5) 22.5 MW Ganol Project commissioned on 01.08.2023 with the following salient features.

## 1.2 Benefits of the Project:

The detailed project report of Ganol Small Hydro Project was prepared by the then Me.S.E.B in 1996 keeping in view the increasing power demand across the state of Meghalaya.

## 1.3 Salient Features

The Ganol SHP envisages the following features.

**A) LOCATION**

| | | |
|---|---|---|
| (i) | State | MEGHALAYA |
| (ii) | District | GARO HILLS |
| (iii) | Town | Near to Tura |

**B) HYDROLOGY**

| | | |
|---|---|---|
| (i) | Catchment area of the stream | 113 Sq. KM |
| (ii) | PMF Design | 1750 Cumes |
| | 75% Dependable Flow | 1810 mm |

**C) RESERVOIR**

| | | |
|---|---|---|
| (i) | Full Reservoir Level | EL 352.00 m |
| (ii) | Minimum Draw Down Level | EL 346.00 m |
| (iii) | Live Storage Volume | 0.85 Millions Cumecs |
| (iv) | Maximum Stretch of reservoir | 2.45 Km |
| (v) | Area of submergence at FRL | 19.59 hectare |

**D) DAM**

| | | |
|---|---|---|
| (i) | Type | Concrete Gravity |
| (ii) | Dam Height from Foundation Level | 35.00 m |
| (iii) | Total Length of dam | 96.50 m |

**E) SPILLWAY**

| | | |
|---|---|---|
| (i) | Spill Way Type | Radial Gated Sluice Spillway |
| (ii) | Crest Elevation | EL 330.00 m |
| (iii) | No. of Sluices | 3 nos |
| (iv) | Size of Sluices | 8.145 m x 7.50 m |

**F) INTAKE**

| | | |
|---|---|---|
| (i) | Intel Elevation | EL .340.00 m |
| (ii) | Design Discharge | 17.64 cumec |
| (iii) | Gate Type ( at the Tunnel entrance) | Vertical Fixed Wheel Type |

**G) Head race Tunnel (HRT)**

| | | |
|---|---|---|
| (i) | Shape (D Shaped; hxd) | 3.20 m dia |
| (ii) | Length | 1984.27 m |
| (iii) | Slope | 1:138.33 |
| (iv) | Excavation Diameter | 3.90 m dia |
| (v) | Internal Diameter | 3.20 m dia |
| (vi) | Discharge | 16.86 cumecs |

**H) Surge Shaft**

| | | |
|---|---|---|
| (i) | Type | Restricted Orifice Vertical Shaft |
| (ii) | Top Elevation | EL. 368.00 m |
| (iii) | Bottom Elevation of Main Shaft | EL. 321.00 m |
| (iv) | Height of Shaft | 47 m |
| (v) | Internal Diameter | 8 m |

**I) Pressure Shaft**

| | | |
|---|---|---|
| (i) | Total Length | 707.24 m |
| (ii) | Pressure Shaft | 2.20 m dia |
| (iii) | Steel liner thickness upto | Varies from 10mm to 25mm |
| (iv) | Diameter after double bifurcation | 1.27 m |
| (v) | Velocity for Nominal Discharge | 6.0 m/sec |

## J) POWER HOUSE

| | | |
|---|---|---|
| (i) | Type | Surface Power House |
| (ii) | Dimensions (1 x w) | 30m x 14.1 m |
| (iii) | Turbine Type | Francis, Horizontal |
| (iv) | Number of units | Three (3) |
| (v) | Rated Discharge per unit | 5.56 Cumec |
| (vi) | Turbine Speed | 750 rpm |
| (v) | Net rated Head | 148 m |
| (vi) | Installed Capacity | 3x7.5 = 22.5 MW |
| (vii) | Plant Load Factor | 56% |

## K) SWITCH YARD

| | | |
|---|---|---|
| i) | Area | 45.00 mm x 63.30 m |
| ii) | Voltage Bus Bar | 132 Kv / 11 Kv |

## L) Energy Benefits

| | | |
|---|---|---|
| i) | Design Energy (75% dependable Year) | 67.09 GWh |

## M) CONSTRUCTION PERIOD

| | | |
|---|---|---|
| i) | Construction Period in months | 28 Months |

# 2. Summary of the Petition

The Summary of the petition filed by MePGCL for approval of Generation Tariff for Ganol SHP are as given in the following paragraphs.

## 2.1 Cost Estimates, Funding Pattern and Cost to Completion

The detailed cost estimates for the GANOL Small Hydro Project are based on the rates of various items of works adopted for several projects under implementation now in Meghalaya.

The approved revised cost of the Project at 2019 Price Level is Rs.507.71 crore, which is based on the designs and drawings received after review from Central Water Commission. The Revised cost estimate has been approved by the Board of Directors.

The bifurcation of the revised approved capital cost of the project is as under:

**Table 2.1 : Abstract of Revised Cost Estimate of Ganol SHP**

| ABSTRACT OF REVISED COST ESTIMATE FOR GANOL SMALL HYDRO PROJECT (3X7.5 = 22.5 MW), TURA, MEGHALAYA. | | | |
|---|---|---|---|
| **Sl. No.** | **Description of works** | **Approved Estimate 2014 (Rs in Lakhs)** | **Corrected Projected Cost as per 2019 Price level (Rs in Lakhs)** |
| **1** | **2** | **3** | **4** |
| **A** | **CIVIL WORKS** | | |
| **I** | **Direct Charges** | | |
| 1 | A. Preliminary | 452.76 | 312.24 |
| 2 | B. Land | 2766.07 | 467.22 |
| 3 | C. Works – | | |
| | - River Diversion | 377.80 | 610.50 |
| | - Dam | 5146.13 | 8132.04 |
| | - Intake | 605.27 | 897.74 |
| | - Hydro Mechanical Works | 987.16 | 1226.49 |
| | - Instrumentation | 20.34 | 87.16 |
| | **Total of C - Works** | **7136.70** | **10953.93** |
| 4 | J. Power Plant Civil Works | | |
| | - Head Race Tunnel i/c Desilting Chamber &Adit | 1868.82 | 3816.76 |
| | - Surge Shaft | 756.31 | 2041.26 |
| | - Pressure Shaft & Penstock | 4131.94 | 9141.31 |
| | - Power House & Tail Race | 1722.75 | 3624.37 |
| | - Switchyard | 82.92 | 1283.88 |
| | - Hydro-Mechanical Works | 224.47 | 136.49 |
| | **Total of J - Power Plant Civil Works** | **8787.21** | **20044.08** |
| 5 | K. Buildings | 540.00 | 641.02 |
| 6 | M. Plantation | 20.79 | 7.46 |
| 7 | O. Miscellaneous | 330.07 | 639.97 |
| 8 | R. Communication | 1194.88 | 1838.62 |
| 9 | Q. Special T&P | 127.41 | 147.64 |
| 10 | X. Environment & Ecology | 375.90 | 453.25 |
| 11 | P. Maintenance during construction Actual | 105.69 | 158.00 |
| 12 | Y. Losses on stock @ 0.25% (of I - Works less A, B & Q) | 26.42 | 26.42 |
| | **Total of I - Works** | **21863.90** | **35689.85** |
| ii | Establishment | | |
| | | 987.07 | 2558.00 |
| iii | Tools & Plants | | |
| | | 128.70 | 10.00 |
| iv | Receipts & Recoveries | -43.67 | -133.99 |
| | **Total Direct Charges** | **22936.00** | **38123.86** |
| **II** | **INDIRECT CHARGES** | | |
| | (i) Audit & Accounts | 64.35 | 25.00 |
| | **Direct Charges** | **22936.00** | **38123.86** |
| | **Indirect Charges** | **64.35** | **25.00** |
| | **Total cost of civil works** | **23000.35** | **38148.86** |
| **B.** | **ELECTRICAL & MECHANICAL WORKS** | **7953.00** | **7769.12** |
| | **Total of A & B** | **30953.35** | **45917.98** |
| **C.** | **Escalation** | **2321.50** | **3000.00** |
| **D.** | **IDC** | **2368.50** | **1853.00** |
| | **TOTAL** | **Rs. 35,643.35** | **Rs. 50,770.98** |

However, there has been increase in the approved cost. The Audited Cost as on June 2023 (prior to COD) is tabulated below:

**Table 2.2 : Actual Expenditure Incurred up to June 2023 (Prior to COD)**

| S No. | Description of Works | Revised Estimate (2019) (Rs in Lakhs) | Expenditure Upto June 2023 (Rs in Lakhs) |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| **I** | **Direct Charges** | | |
| 1. | A. Preliminary | 312.24 | 328.80 |
| 2. | B. Land | 467.22 | 425.67 |
| 3. | C. Works | | |
| | -River Diversion | 9640.28 | 8927.09 |
| | -Dam | | |
| | -Intake | | |
| | -Hydro Mechanical Works | 1226.49 | 819.22 |
| | -Instrumentation | 87.16 | 0.00 |
| | Total C Civil Works | 10953.93 | 9746.31 |
| 4. | Power Plant Civil Works | | |
| | Head Race Tunnel I/C Desilting Chamber and Adit | 3816.76 | 3952.07 |
| | Surge Shaft | 2041.26 | 2016.53 |
| | Pressure Shaft and Penstock | 9141.31 | 9152.82 |
| | Power House & Tail Race | 3624.37 | 3828.75 |
| | Switchyard | 1283.88 | 1363.91 |
| | Hydro Mechanical Works | 136.49 | 9.45 |
| D | Total Power Plant Civil Works | 20044.07 | 20323.53 |
| 5 | Buildings | 641.02 | 549.32 |
| 6 | Plantation | 7.46 | 5.21 |
| 7 | Miscellaneous | 639.97 | 604.01 |
| 8 | Communication | 1838.62 | 1742.13 |
| 9 | Special T&P | 147.64 | 92.91 |
| 10 | Environment and Ecology | 453.25 | 398.62 |
| 11 | Maintenance during Construction Actual @1% (D-5,6,7,8,9,10) | 158.00 | 178.87 |
| 12 | Losses on Stock@0.25% (D-A,B and 9) | 26.42 | 0.00 |
| 13 | Total Works | 35689.95 | 34395.38 |
| 14 | Establishments | 2558.00 | 3718.06 |
| 15 | Tools and Plants | 10.00 | 0.00 |
| 16 | Receipts and Recoveries | (-) 133.99 | 0.00 |
| | Total Direct Charges | 38123.86 | 38113.44 |
| **II** | **Indirect Charges** | | |
| | Audit and Accounts | 25.00 | 0.00 |
| | Direct Charges | 38123.86 | 38113.44 |
| | Indirect Charges | 25.00 | 0.00 |
| | Total Cost of Civil Works | 38148.86 | 38113.44 |
| | Electrical and Mechanical Works | 7769.12 | 6194.34 |
| | Cost of Construction without IDC | 45917.98 | 44307.78 |
| | Escalation/ Price Variation | 3000.00 | 6726.85 |
| | Project Cost Excluding IDC | 48917.98 | 51034.63 |
| | IDC | 1853.00 | 2499.72 |
| | **Total Project Cost Including IDC** | **50770.98** | **53534.35** |

It is submitted that though the project has been declared under Commercial Operation since August 2023, however billing for certain enabling works which are completed or on verge of completion on COD is still pending due to lack of administrative approval. MePGCL is in the process of obtaining the administrative approval. The expected cost to completion is Rs.602 Cr. (approximately).

## 2.2 Funding Pattern

The project was planned to be funded by loan, grant and equity. The summary of capital funding availed is as shown below:

**Table 2.3 : Funding Pattern Approved for Ganol Small Hydro Project**

| Capital funding planned | Loan | Grant | Equity | Total |
|---|---|---|---|---|
| | 223.11 | 229.98 | 54.62 | 507.71 |

Further to funding pattern balance billing which is proposed to be billed after administrative approval, which is still not decided. Considering the balance billing to be met through debt equity ratio of 70:30 the funding pattern for cost to completion would be as follows:

**Table 2.4 : Tentative Funding Pattern of Cost to Completion**

| Capital funding planned | Loan | Grant | Equity | Total |
|---|---|---|---|---|
| | 215.70 | 314.00 | 72.30 | 602.00 |

Thus as per the funding the total cost for the purpose of tariff comes out to be Rs.288.00 Cr. (Rs.602- Rs.314.00), and the per MW cost turns out to be Rs. 12.80 Cr./MW

## 2.3 Calculation of Generic Tariff for Ganol

As explained earlier MePGCL has adopted the methodology of generic tariff for the Ganol Project under this Petition. All the provisions of the 2014 RE Tariff Regulations have been followed for the purpose of calculation of the components of AFC. The assumptions adopted for the purpose of calculation are as under:

### 2.3.1 Assumptions

| Assumptions | Legend | Value | Remarks |
|---|---|---|---|
| Project Capacity | MW | 22.5 | |
| Project Cost | | | |
| Normative Project Cost | Rs Lakh/MW | 1200 | Regulation 31(2) Amended |
| Normative Project Cost | Rs. Cr | 270 | |
| Debt (%) | % | 70% | Regulation 15 (b) |

| | | | |
|---|---|---|---|
| Equity (%) | % | 30% | Regulation 15 (b) |
| Debt Amount | Rs. Cr | 189 | |
| Equity Amount | Rs. Cr | 81 | |
| Useful Life | Years | 40 | Regulation 2.1(37 b) |
| Rate of Interest | % | 9.28% | Base Rate for First 6 months of 2022-23- Regulation 18 (b) |
| Loan Tenure | Years | 12 | Regulation 18 |
| Depreciation | % | 5.83% | Regulation 19(2) |
| Return on Equity | % | 16% | Regulation 20(2) |
| WACC | % | 9.03% | |
| CUF | % | 45% | Regulation 32 |
| Aux Consumption | % | 1% | Regulation 33 |
| O&M Expenses | Rs. Lakh/MW | 34.47 | Regulation 35(1) |
| O&M Escalation | % | 6% | |
| Hours for Operation | Nos | 8760 | |
| O&M Expenses for WC | Months | 1 | Regulation 21 (1) |
| Receivables | Months | 2 | Regulation 21 (1) |
| Maintenance Spares | % | 15% | Regulation 21 (1) |
| Interest on Working Capital | % | 9% | Regulation 21 (3) |

The detailed calculation of individual components has been computed separately in the subsequent sections of this chapter.

### 2.3.2 Capacity Utilization Factor and Auxiliary Consumption

As per Regulation 32 of the 2014 RE Tariff Regulations:

*32. Capacity Utilization Factor*

*"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."*

In line with the provisions of the above Regulations the Normative CUF for Ganol SHP has been considered as 45% for the purpose of calculation of Levellized Tariff.

Further, Regulation 33 of the 2014 RE Tariff Regulations:

*"33. Auxiliary Consumption*

*Normative auxiliary consumption for Small hydro projects shall be 1.0 %."*

Accordingly, the auxiliary consumption has been considered as 1% for the purpose of calculation of levellized tariff for Ganol SHP.

### 2.3.3 Capital Cost

As per the Regulation 31(2) of the 2014 RE Tariff Regulations as amended vide notification dated 23rd June 2022.

*"31(2) The normative capital cost for Small Hydro Projects shall be as follows:*

| Size of Project | Capital Cost (Rs. Lakh/MW) |
|---|---|
| Below 5 MW | 1500 |
| 5 MW to 25 MW | 1200 |

*(b) The normative capital cost shall be increased annually by an escalation factor equal to the annual rate of inflation on the Wholesale Price Index for all commodities from 2023-24 onward."*

Since, Ganol Project has been commissioned in August 2023, no escalation on normative capital cost in the above Regulations has been considered and accordingly the normative capital cost of Rs. 1200 Lakh/MW has been considered for the purpose of calculation of the fixed cost components. The normative project cost for Ganol Project in terms of Rs. Crore comes out to be Rs. 270 Cr.

MePGCL requested the Commission to approve the normative capital cost of the Ganol Project as Rs. 270 Cr.

### 2.3.4 Debt Equity Ratio

Regulation 15 of the 2014 RE Tariff Regulations states that:

15. Levellized Tariff

*"a. Levellized tariff is calculated by carrying out levellisation for 'useful life' of each technology considering the discount factor for time value of money.*

*b. The discount factor considered for this purpose is equal to the Post Tax weighted average cost of the capital on the basis of normative debt: equity ratio (70: 30) specified in the Regulations. Considering the normative debt equity ratio and weighted average of the post-tax rates for interest and equity component, the discount factor is calculated."*

Accordingly, MePGCL has considered the debt: equity ratio of 70:30 for the purpose of calculation of the levellized tariff for Ganol SHP. MePGCL requested Commission to approve the same.

### 2.3.5 Loan Tenure and Rate of Interest

Regulation 18 of the 2014 RE Tariff Regulations specifies that:

*"18. Interest and Finance Charges on Loan Capital*

*(1) Loan tenure for the purpose of determination of tariff, loan tenure of 12 years shall be considered.*

*(2) Interest Rate*

*a) The loans arrived at in the manner indicated above in Regulation 17 shall be considered as gross normative loan for calculation of interest on loan. The normative loan outstanding as on April 1st of every year shall be worked out by deducting the cumulative repayment up to March 31st of previous year from the gross normative loan.*

*b) For the purpose of computation of tariff, the normative interest rate shall be considered as average State Bank of India Base Rate prevalent during the first six months of the previous year plus 150 basis points.*

*c) Notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed. "*

Accordingly, MePGCL has considered 70% of the normative project cost as loan amount for a tenure of 12 years and the depreciation calculated as per the provisions of 2014 RE Tariff Regulations has been considered as normative Repayment.

Further, the average State Bank of India base rate during the first six months of previous years comes out to be 7.78% hence the rate of interest has been considered as 9.28% i.e., (SBI base rate plus 150 basis points).

MePGCL requested the Commission to approve the tenure, loan amount and rate of interest as stated above.

### 2.3.6 Return On Equity

Regulation 20 of the 2014 RE Tariff Regulations specifies that:

*"20. Return on Equity*

*(1) The value base for the equity shall be 30% of the capital cost for generic tariff determination or actual equity (in case of project specific tariff determination) as determined under Regulation 17.*

*(2) The normative Return on Equity shall be: 16% Provided that in case of projects commissioned after notification of these regulations an additional return of 1.0% shall be allowed if such projects are completed within the timeline approved in the sanctioned Detail Project Report and within the original sanctioned project cost without cost overrun."*

Accordingly, MePGCL has considered the 30% of the normative project cost as Equity component and has considered the rate of return on equity of 16%. MePGCL requested the Commission to approve the same.

### 2.3.7 Depreciation

Regulation 19 of 2014 RE Tariff Regulation specifies the following:

*"19. Depreciation*

*For the purpose of tariff determination, depreciation shall be computed in the following manner,*

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

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

*(2) Annual Depreciation shall be based on ''Differential Depreciation Approach' using 'Straight Line Method' over two distinct periods comprising loan tenure and period beyond loan tenure over useful life. The depreciation rate for the first 12 years of the Tariff Period shall be 5.83% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 13th year onwards.*

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

Accordingly, MePGCL has considered the rate of depreciation of 5.83% for the first 12 years of operation and the balance depreciation has been spread over the balance useful life of the project.

MePGCL requested the Commission to approve the methodology adopted which is in line with the Regulations.

### 2.3.8 Operation and Maintenance Expenses

As Per Regulation 35(1) of 2014 RE Tariff Regulations as amended vide notification dated 23rd June 2022:

*35(1) The normative O&M expenses for small hydro projects shall be as given below:*

| Size of Project | O&M Expenses (Rs. Lakh/MW) |
|---|---|
| Below 5 MW | 45.96 |
| 5 MW to 25 MW | 34.47 |

(2) The normative O&M expenses shall be escalated at the rate of 5.72% per annum over the tariff period for the determination of levellized tariff.

Accordingly, the normative O&M expenses for the first year has been claimed as Rs. 34.47 lakh/MW and the escalation of 5.72% has been considered over the next 40 years.

MePGCL requested Commission to approve the O&M expenses as claimed in the Petition.

### 2.3.9 Interest on Working Capital

Regulation 21(1) of the 2014 RE Tariff Regulations prescribes the methodology of calculation of working capital as below:

*21. Interest on Working Capital*

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

*a) Operation & Maintenance expenses for one month;*

*b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilisation Factor (CUF);*

*c) Maintenance spare @ 15% of operation and maintenance expenses;*

Further Regulation 21(3) states that:

*"(3) Rate of Interest on Working Capital shall be at interest rate equivalent to average State Bank of India Base Rate prevalent during the first six months of previous year plus 100 basis points."*

Accordingly, the rate of interest on working capital comes out to Rs. 8.78%.

## 2.4 Calculation of Generic Tariff for Ganol

**Table 2.5 : Calculation of Levellized Tariff**

| **AFC** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depreciation | 15.74 | 15.74 | 15.74 | 15.74 | 15.74 | 15.74 | 15.74 | 15.74 | 15.74 | 15.74 | 15.74 | 15.74 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 |
| Interest on Loan | 16.81 | 15.35 | 13.89 | 12.43 | 10.97 | 9.50 | 8.04 | 6.58 | 5.12 | 3.66 | 2.20 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Return on Equity | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 |
| O&M Expenses | 7.76 | 8.20 | 8.67 | 9.16 | 9.69 | 10.24 | 10.83 | 11.45 | 12.10 | 12.79 | 13.53 | 14.30 | 15.12 | 15.98 | 16.90 | 17.86 | 18.89 | 19.97 | 21.11 | 22.32 |
| Interest on Working Capital | 0.95 | 0.95 | 0.94 | 0.94 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.94 | 0.94 | 0.95 | 0.76 | 0.79 | 0.82 | 0.86 | 0.89 | 0.93 | 0.97 | 1.02 |
| **Total AFC** | **54.22** | **53.19** | **52.20** | **51.23** | **50.29** | **49.38** | **48.51** | **47.66** | **46.86** | **46.09** | **45.37** | **44.69** | **30.77** | **31.67** | **32.61** | **33.61** | **34.67** | **35.79** | **36.97** | **38.22** |
| AFC Rs./kWh | 6.17 | 6.06 | 5.94 | 5.83 | 5.73 | 5.62 | 5.52 | 5.43 | 5.34 | 5.25 | 5.17 | 5.09 | 3.50 | 3.61 | 3.71 | 3.83 | 3.95 | 4.08 | 4.21 | 4.35 |
| Discount Factor | 1.00 | 0.92 | 0.84 | 0.77 | 0.71 | 0.65 | 0.60 | 0.55 | 0.50 | 0.46 | 0.42 | 0.39 | 0.35 | 0.33 | 0.30 | 0.27 | 0.25 | 0.23 | 0.21 | 0.19 |
| PU of AFC | 54.22 | 48.79 | 43.91 | 39.53 | 35.59 | 32.06 | 28.88 | 26.03 | 23.47 | 21.18 | 19.12 | 17.27 | 10.91 | 10.30 | 9.73 | 9.20 | 8.70 | 8.24 | 7.80 | 7.40 |
| PU of Generation | 87.81 | 80.54 | 73.87 | 67.75 | 62.15 | 57.00 | 52.28 | 47.95 | 43.98 | 40.34 | 37.00 | 33.94 | 31.13 | 28.55 | 26.19 | 24.02 | 22.03 | 20.21 | 18.53 | 17.00 |
| . | | | | | | | | | | | | | | | | | | | | |
| **AFC** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** |
| Depreciation | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 | 1.93 |
| 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 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Return on Equity | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 | 12.96 |
| O&M Expenses | 23.59 | 24.94 | 26.37 | 27.88 | 29.47 | 31.16 | 32.94 | 34.82 | 36.81 | 38.92 | 41.15 | 43.50 | 45.99 | 48.62 | 51.40 | 54.34 | 57.45 | 60.73 | 64.21 | 67.88 |
| Interest on Working Capital | 1.06 | 1.11 | 1.16 | 1.21 | 1.27 | 1.33 | 1.40 | 1.46 | 1.53 | 1.61 | 1.69 | 1.77 | 1.86 | 1.95 | 2.05 | 2.16 | 2.27 | 2.39 | 2.51 | 2.64 |
| **Total AFC** | **39.55** | **40.94** | **42.42** | **43.98** | **45.64** | **47.38** | **49.23** | **51.18** | **53.24** | **55.42** | **57.73** | **60.16** | **62.74** | **65.47** | **68.35** | **71.39** | **74.61** | **78.01** | **81.61** | **85.41** |
| AFC Rs./kWh | 4.50 | 4.66 | 4.83 | 5.01 | 5.20 | 5.40 | 5.61 | 5.83 | 6.06 | 6.31 | 6.57 | 6.85 | 7.15 | 7.46 | 7.78 | 8.13 | 8.50 | 8.88 | 9.29 | 9.73 |
| Discount Factor | 0.18 | 0.16 | 0.15 | 0.14 | 0.13 | 0.12 | 0.11 | 0.10 | 0.09 | 0.08 | 0.07 | 0.07 | 0.06 | 0.06 | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 | 0.03 |
| PU of AFC | 7.02 | 6.67 | 6.34 | 6.03 | 5.74 | 5.46 | 5.20 | 4.96 | 4.74 | 4.52 | 4.32 | 4.13 | 3.95 | 3.78 | 3.62 | 3.47 | 3.32 | 3.19 | 3.06 | 2.94 |
| PU of Generation | 15.59 | 14.30 | 13.12 | 12.03 | 11.04 | 10.12 | 9.28 | 8.52 | 7.81 | 7.16 | 6.57 | 6.03 | 5.53 | 5.07 | 4.65 | 4.27 | 3.91 | 3.59 | 3.29 | 3.02 |
| **Levellized Tariff (Rs./kWh)** | **5.40** | | | | | | | | | | | | | | | | | | | |

# 3. Public Hearing Process

## 3.1 General

Section 64 (2) of electricity act 2003 read with Regulation 19 of MSERC MYT Regulations 2014 mandates the Generation utility to publish the Tariff petition in an abridged format in the leading news papers inviting the objections/suggestions on the Tariff petition from the stakeholders.

MePGCL has published the Tariff petition as Public Notice on **22nd and 23rd January, 2024** in local dailies.

In pursuance of the publication of the Tariff petition in the leading newspapers, M/s Byrnihat Industries Association (BIA) has filed written suggestions/objections on the petition filed by the MePGCL seeking approval of Generic Tariff for Ganol Small Hydro Project.

## 3.2 Objections / Suggestions of Stakeholders

### 1 Byrnihat Industries Association (BIA)

**a. Project Details**

(7-13) The Petitioner has submitted that the Ganol Hydro Electric Project (hereinafter referred as "Ganol SHEP") having a capacity of 22.5 MW, is a Small Hydro Project under Regulation 2 (33) of RE Tariff Regulations 2014. As per the Regulation 2 (33) of the RE Tariff Regulations 2014, Small Hydro Project is defined as follows:

"'Small Hydro' means Hydro Power projects with a station capacity upto and including 25 MW"

The Petitioner has further submitted that Ganol SHEP, being a Small Hydro Project with capacity lower than or equal to 25MW, is eligible to qualify as RE based Generating Stations for determination of Tariff under RE Tariff Regulations 2014.Relevant Regulations 4 (2) of RE Tariff Regulations 2014 is reproduced below:

*"4. Eligibility Criteria*

*(1) For the purposes of these regulations, generation from all types of Renewable Energy Sources, as approved by Ministry of New and Renewable Energy (MNRE), Government of India shall be*

*considered and such generating stations shall be collectively referred to as "RE based Generating Stations".*

*(2) At present, generation from the following sources and technologies shall qualify to be covered under these regulations:*

*(b) 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."*

In view of the above, the Petitioner has submitted the present petition to determine the generic tariff in line with the Regulations 11 of RE Tariff Regulations 2014. Regulations 11 of RE Tariff Regulations 2014 is reproduced below:

*"11. Generic Tariff*

*(1) Generic tariff shall be determined on the petition filed by eligible RE generator for such renewable energy technologies indicated in Regulation 4.*

*(2) The Generic Tariff would be based on normative parameters as per the norms specified in these regulations for each type of renewable energy source and the year of commissioning of the plant.*

*(3) The tariff determined being normative, no true up of any parameter, including additional capitalization, for what so ever reasons shall be taken up during the validity of the tariff; any short fall or gain due to performance or other reasons is to be borne/retained by the RE based generating stations."*

The Ganol Small Hydro Project was conceived and planned way back in 2006-07 to enhance the power generation in the State especially in Garo Hills region. It is the first Hydro Project in Garo Hills which is expected to relieve the region from frequent interruption of power supply. The construction of the project started in 2014 and the project has been commissioned on 01.08.2023.

The Project lies in the Garo Hills district of Meghalaya and close to Tura (7 km to the west of Tura town), the district headquarters. Ganol SHEP is a runoff the river scheme with installation of (3x7.5) 22.5 MW Power station on the Ganol River, also called the Kalu river having / joined by a tributary of the Rongram river.

The design energy considering 75% dependable year is expected to be around 67.09 Gwh as per the petition and the plant load factor will be around 56%.

At the outset it is submitted that as per Regulation 12 of the RE Tariff Regulations 2014, the present petition is to be accompanied by the Detailed Project Report. However, no DPR has been annexed with the petition. Without the DPR the consumers are in the dark regarding the estimated cost of the project, the design energy and the expected generation. Hence, it is requested that this Hon'ble Commission approve the tariff post inspection of the DPR.

The Objector herein below submits its comments/ suggestions to the Petition filed by the Petitioner for approval of Generic Tariff for Ganol SHEP under RE Tariff Regulations 2014.

**MePGCL Reply**

Under Para 7 to 13 the BIA has submitted general contentions which do not require any specific reply. However, BIA has contended that the Petitioner should have submitted the DPR for the project along with the Petition. In this regards the Petitioner submits that the Petitioner is in the process of getting the third party audit report from IIT Guwahati and craves leave of the Hon'ble Commission to submit the DPR and the third party report during the course of proceedings.

**Commission's Views**

Commission noted the Response of the Utility.

**b. Commercial Operation Date (COD) of the Plant**

(14-19)The Petitioner in the instant petition has stated that though the project has been declared under Commercial Operation since August 2023, however billing for certain enabling works which are completed or on verge of completion on COD is still pending due to lack of administrative approval. The Petitioner stated that it is in the process of obtaining the administrative approval.

It is submitted that the lackluster approach of the Petitioner in relation to cost finalization of the project is evident from the fact that billing of certain works is still pending even after 4 months of COD.

It is further submitted that there is a huge delay in achieving COD of the project. The Objector requests that this Hon'ble Commission may disallow any cost related to cost overrun and time overrun under the head of capital cost.

It is submitted that in the past few years, the Petitioner has been submitting different dates of COD of the project and the current petition fails to highlight any reasons for such prolonged delay in achieving COD of the Plant. Therefore, the Hon'ble Commission may consider the delay in COD of the plant without any cost escalation.

It is evident from the table that in Tariff Order dated 31.03.2018, the Petitioner had submitted that the expected COD of the plant would be in FY 2018 with the capital cost of Rs. 356.42 Crore. Since the project started in FY 2014, the 4 years construction timeline was envisaged and accordingly, COD was estimated to be in FY 2018. However, the actual COD of the project has been achieved in August 2023 resulting in delay of more than 5 to 6 years without any detailed justification from the Petitioner in the Petition.

Hence, it is requested that such delay without any justification may not be considered by the Hon'ble Commission and no cost related to time and cost overrun may be allowed.

**MePGCL Reply**

BIA has alleged that despite the commercial operation of the project in August 2023, the billing of some of the enabling works is still pending. The BIA has alleged that this is lacklustre approach of the Petitioner in finalization of the project.

BIA has further alleged that there is huge delay in achieving the COD of the project and has prayed that the delay and subsequent time and cost overrun should not be considered without any proper justification.

In regard to the above, it is submitted that in the power projects it is a general practice where the billing of some of the works is done after final take-over, guarantee, warrantee period and other closure of points related to handing over and taking over of the projects after quality checks etc. Further, as stated in the Petition, the administrative approval of the revised capital cost is also pending. Hence, billing of certain works is pending and there has been no lethargy on the part of Petitioner.

Further, with regard to the delay in commissioning of the project, the Petitioner would like to submit that development of the hydro project has to face a lot of challenges like geological surprises, floods etc. which result in the time and cost overrun. Similar situations were faced by the Petitioner during the development of the instant project. The detailed reasons for the delay have been submitted on 19/02/2024before this Hon'ble Commission as an additional information sought by the Hon'ble Commission.

The Petitioner craves leave to submit any other relevant documents as directed by the Hon'ble Commission from time to time.

**Commission's Views**

Commission noted the Response of the Utility.

**c. Capital Cost of the Plant**

(20-33)The Petitioner has submitted that the revised cost as approved by the Board of Directors of the Petitioner at 2019 price level was Rs. 507.71 Crore and the audited cost till June 2023 is Rs. 535.34 Crore and the expected actual cost till CoD is Rs. 602 Crore approximately. However, billing for certain enabling works which are completed or on verge of completion on COD is still pending due to lack of administrative approval and hence there is a probability of the increased in the capital cost as claimed by the Petitioner.

It is submitted that as per the Audited Certificate, the administrative approval of the project as accorded by Government of Meghalaya was Rs. 177.52 Crore (Rs. 7.89 Crore/MW) in FY 2008. Later, the Petitioner in FY 2018 had approached the Hon'ble Commission with the capital cost of Rs. 356.42 Crore (Rs. 15.84 Crore/MW) which was revised in FY 2020 as Rs. 507.71 Core (Rs. 22.56 Crore/MW) as per 2019 price level. Again, the same was revised in Case No. 20/2023 as Rs. 596.11 Crore (Rs. 26.49 Crore / MW) and at present in the current petition, the capital cost is revised as Rs. 602 Crore (Rs. 26.76 Cr/ MW) which is still an estimate number.

It is submitted that the Petitioner has increased the capital cost from Rs. 356.42 Crore to Rs. 602 Crore, which is an overall increase in cost by 68.90%, without any justification or explanation.

It is further submitted that, while the Petitioner has set out capital cost of Rs. 602 Crore which is 382% higher than the normative capital cost as per RE Tariff Regulations 2014 and 223% higher than the normative capital cost as per the First Amendment in RE Tariff Regulations 2014, it has not provided any documents to justify the same. Since, the Petitioner in the present Petition, has claimed only normative capital cost as per RE Tariff Regulations (First Amendment) 2014, it is necessary to justify the high capital cost incurred for the said project. It is necessary for Petitioner, being a regulated entity, to provide the granular and chronological details of time and cost overrun and Critical Path Analysis and Project Evaluation and Review Technique (PERT) chart to substantiate the delay in commissioning of the project.

It is further submitted that as per the Auditor's Certificate, the land on which the project is located has been purchased by MECL and the title of the land is not vested in the name of the Petitioner Company which is also a matter of concern whereby the proper prudence check on any additional cost to be incurred in relation to land need not be allowed in future. Further, the Auditor's Certificate only provides the certificate of the total amount without any detailed breakup of the cost certification. Since the detailed breakup of capital cost and undischarged liabilities is not provided and the capital cost claimed by the Petitioner is as per the normative capital cost, no additional capitalization in future may be allowed with respect to Ganol SHEP which results in increase in tariff burden on the consumers.

Further, as per Regulations 31 (2) of RE Tariff Regulations 2014, the normative capital cost of the project is Rs. 7 Cr/MW which was revised by the Amendment dated 23.06.2022 as Rs. 12 Cr/MW. It is submitted that even though the capital cost as claimed by the Petitioner in the instant petition is the normative capital cost as per the First Amendment to RE Tariff Regulations 2014, it is necessary to scrutinize the resultant threefold increase in the capital cost as financial prudence within the company is required

to be followed so as to avoid any undue financial burden on the consumers in the future as the resultant cash outflow recovery will still be questionable for this project.

It is submitted that the construction activity for the project started in FY2014 and the project was envisaged to achieve COD in FY 2018. Though the delay on the part of the Petitioner by 5 to 6 years has resulted in COD of the project to be achieved in August 2023, the benefit of higher capital cost and other normative parameter as provided in the amended RE Tariff Regulations 2014 dated 23.06.2022 may not be considered for the said project. It is submitted that the norms applicable for the said project ought to be as per the RE Tariff Regulations 2014 and not as per the amended Regulations.

It is further submitted that Regulations 26 of RE Tariff Regulations 2014 clearly states that any incentive or subsidy offered by the Central or State Government must be considered while determining the tariff. Regulations 26 of RE Tariff Regulations 2014 is reproduced below:

"26. Subsidy or incentive by the Central/State Government the Commission shall take into consideration any incentive or subsidy offered by the Central or State Government, including accelerated depreciation benefit for the renewable energy power plants while determining the tariff under these Regulations.

The Petitioner has submitted that Rs. 314 Crore has been provided by the Government as a grant to the Petitioner for development of Ganol SHEP. However, while claiming the normative capital cost of Rs. 12 Cr/MW (as per Regulation 31 (2) of Amended Regulations), the Petitioner has not deducted the grant as received by the State Government.

Based on the above submission, it is requested that the Hon'ble Commission may consider the following capital cost of Ganol SHEP while determining the Project capital cost after the adjustment of grant as per Regulations 26 of RE Tariff Regulations 2014.

**Proposal Capital cost to be allowed for Ganol SHEP (Rs. Crore)**

| Particulars | Unit | Actual Cost | As per Petitioner | Norms as per RE Regulations 2014 | Norms as per First Amendment RE Regulations 2014 |
|---|---|---|---|---|---|
| Capital Cost | Rs.Cr/MW | 12.80 | 12.00 | 7.00 | 12.00 |
| Size of the Plant | MW | 22.50 | | | |

| | | | | | |
|---|---|---|---|---|---|
| Capital Cost | Rs.Crore | 602.00 | 270.00 | 157.50 | 270.00 |
| Less: Grant | Rs.Crore | 314.00 | 0.00 | 314.00 | 314.00 |
| Net Capital Cost | Rs.Crore | 288.00 | 270.00 | 0.00 | 0.00 |

Without prejudice to the above submission, it seems that the Petitioner has claimed Rs. 270 Crore against the actual cost of Rs. 288 Crore after the adjustment of the grant, however the intention behind the RE Tariff Regulations 2014 is to adjust the grant / subsidy on the normative capital cost which as per the above table has resulted into ZERO Capital cost i.e. the whole project is funded by the grant. Further, the instant petition filed by the Petitioner is to determine Generic tariff under RE Tariff Regulations 2014 and hence Grant / subsidy is required to be deducted from the normative Capital cost, as prescribed by the Regulations.

It is submitted that in case the Hon'ble Commission approves the capital cost of Rs. 270 Crore as submitted by the Petitioner, for determination of the tariff, it would mean that the Hon'ble Commission has accepted the actual capital cost as incurred to be of Rs. 602 Crore and considered the grant of Rs. 314 Crore, for which a scrutiny of the total cost is required to be undertaken and it would also be in violations to the proviso of the RE Tariff Regulations 2014 which would defeat the basic principle of normative capital cost as specified in the Regulations.

Since the Petitioner has filed the petition, seeking the Generic Tariff determination and has considered the normative Capital Cost, the Objector is not analyzing in detail, the actual breakup of the capital cost and its variance as provided in the petition. Without prejudice to the above submission, in case the Hon'ble Commission decides to consider the capital cost as specified by the Petitioner, then it is also necessary to seek the justification for increase in the capital cost threefold for each and every capital cost item for prudence check.

In view of the above, it is requested that the Hon'ble Commission may consider the normative capital cost as per the RE Tariff Regulations 2014 and then adjust the grant / subsidy to arrive at the capital cost to be considered for the determination of the tariff.

**MePGCL Reply**

BIA has objected that the administrative approval of the project was granted by Government of Meghalaya for Rs. 177.52 Cr in FY 2008 which was subsequently revised to Rs.507.71 Crore. However, the actual expenditure incurred by the Petitioner is Rs.535.34 Crore and the estimated cost of completion is Rs. 602 Cr which is still not finalized. Hence, there has been manifold increase in the capital cost of the project without any proper justification. The Objector has further submitted that as per the auditor's certificate land on which the project is located has been purchased by MeECL and title of the land is not vested with the Petitioner and hence the cost of the land should not be allowed as a part of capital cost.

The objector has contended that the benefit of higher capital cost and other normative parameters as provided in the amended RE Tariff Regulations, 2014 dated 23.06.2022 should not be considered, rather the norms applicable for the project ought to be as per the RE Tariff Regulations, 2014.

The Objector has contended that the Petitioner has received Rs. 314 Cr as grants which has not been adjusted against the normative project cost claimed by the Petitioner and hence, has prayed the Hon'ble Commission to allow zero capital cost for the project.

In this regard, the Petitioner hereby submits that the detailed justification for the delay has been submitted to the Hon'ble Commission as a response to the additional information, which has subsequently resulted in the cost overrun. Further, the impact of inflation has also resulted in the cost overrun as the first administrative approval was accorded at 2008 price level.

With regards to the Objector's contention on land, the Petitioner submits that it has filed the Petition for approval of generic tariff which is based on normative parameters and hence, the individual component need not be taken into account.

Further, the Objector has claimed that the project cost should be zero which is practically impossible. The grants of Rs.314 Crore were received by the Petitioner against the capital cost of Rs. 602 Cr and thus after reduction of the grants the actual cost of the project

comes out to be Rs. 288 Crore. The Petitioner has claimed the normative Capital cost of Rs. 270 Crore which is still less than the actual capital cost of Rs. 288 Crore. Hence, the reduction of the total grants against the normative capital cost is in fructuous and misleading in nature.

**Commission's Views**

Commission noted the Response of the utility.

**d. Capacity Utilization Factor (CuF)**

(34-37) The Petitioner has submitted that as per Regulation 32 of the RE Tariff Regulations 2014, CUF norm is 45% and same is considered for determining the levelized tariff. Regulation 32 of the RE Tariff Regulations 2014 is reproduced below:

"32. Capacity Utilization Factor

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 off ree 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"

It is submitted that as per the salient features of the project as provided in the petition (Table 1- Technical Parameters of Ganol SHP), the CUF of the plant is 56%.

It is submitted that the norms as specified in the RE Tariff Regulations 2014 are a ceiling and in case the actual performance of the plant is better than the norms, the same can be considered for the benefit of the consumers. If the normative CUF of 45% is considered against the actual CUF of 56%, it will result in profiting the Generating plant at the cost of additional burden on the consumers which will be economically unjust for the consumers of the State.

Hence, it is requested that the Hon'ble Commission may consider 56% CUF against the normative CUF of 45% for determination of the levelized tariff.

**MePGCL Reply**

BIA has alleged that:

The Petitioner has claimed the CUF as per the Regulation 32 of the RE Tariff Regulations, however as per the salient features of the project the CUF of Ganol SHP is 56% and has prayed the Hon'ble Commission to consider the CUF of 56% instead of 45%.

In regard to the above, the Petitioner submits as under:

Since, the Petition has been filed on normative parameters for determination of generic tariff and hence the normative parameters have been considered for the purpose of tariff determination.

**Commission's Views**

Commission noted the Response of the utility.

**e. Loan Tenure and Rate of Interest on Loan, Return on Equity & Depreciation**

(38-44)The Petitioner in the instant petition has claimed 70:30 debt: equity ratio as per Regulations 15 of RE Tariff Regulations 2014 and accordingly has arrived at the debt amount of Rs. 189 Crore.

It is submitted that as highlighted in Table 2 of the Objection, the normative capital cost is totally funded by Grant and the capital cost post grant adjustment is nil. Hence, the debt and equity for the project is to be considered as NIL.

**Return on Equity**

The Petitioner in the instant petition has claimed 30% of the capital cost as Equity as per Regulations 15 of RE Tariff Regulations 2014 and accordingly has arrived at the equity amount of Rs. 81 Crore.

It is submitted that as per Regulations 20 of RE Tariff Regulations 2014, the value base for the equity shall be 30% of the capital cost for generic tariff determination or actual equity (in case of project specific tariff determination) as determined under Regulation 17.

It is submitted that as highlighted in Table 2 of the Objection, the normative capital cost is totally funded by Grant and the capital cost post grant adjustment is NIL. Hence, the debt and equity for the project is required to be considered as NIL. Accordingly, the Return on Equity is NIL for the said project.

**Depreciation**

Regulations 19 of RE Tariff Regulations 2014 and has claimed the Depreciation @5.83% for the first 12 years and the remaining depreciation shall be spread over the remaining useful life of the project from 13th year onwards.

However, as submitted in the preceding paragraphs, the whole normative capital cost is funded through government grant and hence the capital cost is NIL, therefore, the depreciation to be allowed for computation of generic tariff may be allowed as NIL.

**MePGCL Reply**

BIA has alleged that:

As per its computation, after reduction of the grants from the normative project cost, the project cost to be considered for tariff determination comes out to be zero hence all the capital cost components i.e., Interest on loan, depreciation, and return on equity should be zero.

In regard to the above, the Petitioner submits as under:

All the fixed cost components have been computed and claimed as per the provisions of RE tariff Regulations. Further, the capital cost of the project being zero is practically impossible and such contentions of the Objector are out rightly rejected.

The Petitioner prays the Hon'ble Commission to consider the fixed cost components as claimed by the Petitioner.

**Commission's Views**

Commission noted the Response of the Utility.

**f. Discount Rate**

(45-46)It is submitted that as per Regulations 14 and 15 of the RE Tariff Regulations 2014, the levelized tariff is required to be calculated based on the discounted rate equivalent to Post Tax weighted average cost of capital. Regulations 14 and 15 of the RE Tariff Regulations 2014 are reproduced below:

"14. Tariff Design

(1) The generic tariff shall be determined on levellised basis for the Tariff Period. Provided that for renewable energy technologies having single-part tariff with two components,

tariff shall be determined on levellised basis considering the year of commissioning of the project for fixed cost component while the fuel cost component shall be specified on year of operation basis.

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

(3) Levellisation shall be carried out for the 'useful life' of the Renewable Energy Project, while tariff shall be specified for the period equivalent to 'Tariff Period'.

15. Levellised Tariff

a. Levellised tariff is calculated by carrying out levellisation for 'useful life' of each technology considering the discount factor for time value of money.

b. The discount factor considered for this purpose is equal to the Post Tax weighted average cost of the capital on the basis of normative debt : equity ratio (70 : 30) specified in the Regulations. Considering the normative debt equity ratio and weighted average of the post tax rates for interest and equity component, the discount factor is calculated."

It is submitted that though the levelized tariff is quoted by the Petitioner in the instant petition, no details have been provided on the discount rate considered by the Petitioner for calculation of such levelized tariff.

**MePGCL Reply**

BIA has alleged that:

The Petitioner has not given any details of the discount rate for the computation of levellized tariff.

With regard to the above, it is submitted that the Petitioner has considered the weighted average capital cost of the project based on the normative cost of debt and normative cost of equity as per the provisions of the Regulations. The discount factor considered by the Petitioner is in line with the provisions of the Regulations without any deviation.

**Commission's Views**

Commission noted the Response of the Utility

**g. Other Provisions**

(47-50) It is submitted that even though in the Petition, the Petitioner has stated that the detailed calculation of the components is being submitted in soft copy (excel format) along with the Petition, the same is not available on the website and as such the submission of the petition is incomplete.

Lastly, it is submitted that vide MYT order dated 25.03.2021 for FY 2023-24, this Hon'ble Commission had allowed Rs. 30.39 crores as power purchase cost of Ganol SHEP for both FY 2022-23 and FY 2023-24 by observing that Ganol will be commissioned in May 2022. The relevant extract at page 100-101 of MYT order dated 25.03.2021 is as below:

"MePGCL in its Business Plan for the Control Period FY 2021-22 to FY 2023- 24 has submitted that Umtru (4x2.8 MW) are out of service and so no generation from this station will be available for the years FY 2021-22 to FY 2023-24. It is also submitted that Umiam Stage - III (2x30 MW) stations will be under shut down for R&M works and hence there shall be no generation from this station during the years FY 2022-23 to FY 2023-24. Ganol (3x7.5) 22.5 MW small hydro power station is expected to be commissioned during May 2022. Therefore MePGCL has projected energy generation from this station in FY 2022-23 and FY 2023-24."

It is submitted that MePDCL has recovered the tariff for Ganol as part of its power purchase cost for FY 2022-23, even though neither a single unit of power from Ganol has been consumed by the consumers of the state. Therefore, the tariff in the present Petition, should only be allowed after setting off the amounts already recovered.

It is further submitted that all costs now being claimed by the Petitioner has to be compared to the costs under the detailed project report.

Therefore, it is requested that this Hon'ble Commission may review the detailed project report and then only approve the tariff.

**MePGCL Reply**

BIA has submitted that:

a) The Petitioner has submitted that the Petitioner has stated that the detailed

calculation sheet has been submitted in the soft copy, but the same has not been made available to the stakeholder.

b) The Hon'ble Commission has allowed Rs.30.39 Crore as power purchase from Ganol SHEP for FY 2022-23 and FY 2023-24 by observing that Ganol shall be commissioned in 2022. MePDCL has recovered the tariff for Ganol as a part of its power purchase cost for FY 2022-23 without any single unit from the Ganol Project. Thus, the tariff for the project should be determined after setting off the amount recovered from the consumer.

In regard to the above, the Petitioner submits as under:

a) The detailed computation sheet has been submitted before the Hon'ble Commission along with the Petition.

b) The matter raised by the Objector does not pertain to the Petitioner company as the Petitioner is claiming the tariff for Ganol SHEP for the first time and till date has not billed to MePDCL in absence of the tariff.

c) However, the Petitioner would like to submit that the actual power purchase cost of MePDCL is adjusted at the time of truing up exercise against the projected power purchase cost. Hence, there is no question of the amount of power purchase from Ganol project considered on projection basis to be adjusted against the tariff of the same.

In view of the above, it is submitted that the objections/suggestions of BIA are devoid of any merit and ought to be rejected. The contents of the Petition are reiterated. All allegations to the contrary are wrong and are denied. The Hon'ble Commission may be pleased to take the submission of the Petitioner on record.

Further, the Petitioner craves leave of this Hon'ble Commission to make any additional submission if required or to submit additional details if directed by the Hon'ble Commission.

**Commission's Views**

Commission noted the Response of the utility.

# 4. Commission's Approach and Analysis

## 4.0 Background

The Meghalaya Power Generation Corporation Limited (MePGCL) has been entrusted with the implementation of 3x7.5 = 22.5 MW Ganol Small Hydro Electric Power Project in Garo Hills district, very close to Tura of Meghalaya.

## 4.1 Filing of the Petition

MePGCL has filed Petition for Determination of Generation Tariff for Ganol Small Hydro Project (3x7.5) 22.5 MW on 12.01.2024.

## 4.2 Sanction of Govt. of Meghalaya

Govt. of Meghalaya has conveyed sanction for implementation of Ganol HE Project (3x7.5) 22.5 MW vide order no. POWE/0029/29032023/4801/01 dated 30.03.2023.

The petitioner has disclosed commencement of project work as 30.06.2014 in their letter no. MePGCL/D/GEN/W-21/2014/36 dated 23rd July 2014 (date of award of contract). Utility has declared CoD on 01.08.2023.

## 4.3 Project Completion

Petitioner was asked to furnish the transaction wise, date wise source wise details of project funding in the commission's letter dated 30.01.2024.

The petitioner has submitted the details in their letter dated 19.02.2024 (the details are attached as Annexure –I to this order).

The petitioner was also asked to furnish the reasons for delay in completion of the project in the commission's letter dated 30.01.2024.

The petitioner has submitted in their letter dated 19.02.2024 the reasons for delay in completion of the project as follows.

1 **Geological Problems during Construction:** Poor Geological conditions were encountered at the following structures.

**a. Dam:**

During general excavation of the Dam, the overburden yielded sandy soil alongwith floating boulders at the flanks which are not suitable foundation grade. The right abutment was required to be extended by more than 10 m thus leading to the creation of another Block. The foundation was excavated beyond the projected level to reach stable grade.

Further, at the foundation level of Blocks 4 & 5, a depression zone was encountered which spans about 60m lengthwise and has a maximum width of 9 m and maximum depth of Sm. Detailed investigation had to be carried out by drilling and permeability test was also conducted and on the basis of the test results, adequate treatment to stabilize the dam foundation was carried out by clearing all the loose materials from the depression and filling up the same with M20 grade of concrete after which contact grouting was done to prevent seepage.

**b. Surge Shaft:**

The areas surrounding the Surge Shaft are of sandy soil. During open excavation frequent landslides were experienced, especially during the rainy season. To contain the frequent land slips, retaining walls were also constructed at strategic points along the periphery of the Surge Shaft and Drainage were provided for run off so that the soil is not eroded. Temporary slope stabilization were also carried out by stacking filled gunny bags for protection during construction. Due to poor geological formation, the sinking of the shaft had to be treaded cautiously. Heavy steal rib supports had to be provided for about 60% of the entire height of the shaft and for the remaining portion rock bolting had to be provided. Permanent Slope stabilization measures around the Surge Shaft had to be provided to ensure the safety of the structure.

**c. Penstock/Pressure Shaft:**

As per DPR, the Penstock was to be placed over ground. However, during the detailed survey on the geological profile, it was found that the overburden extended beyond 20-25 m below the Natural Slope Level (NSL), which would require deep foundations

for the Anchor Blocks and Saddles. It was apprehended that this may destabilize the hill slope and may compromise the safety of the Power House. Hence, it was decided that the surface Penstock be converted to an underground Pressure Shaft. The underground excavation of Pressure Shaft also yielded poor rock conditions at many locations which reinforcement measures which required proper reinforcement measures by providing of steel supports wherever required. Rock bolting and grouting measures had to be also adopted for stabilizing the surrounding rock mass. The problem of land slip was also encountered at the Upper Horizontal Pressure Shaft (UHPS) Portal as well as at the Lower Horizontal Pressure Shaft (LHPS) Portal when open excavation was carried out. The Problem had to be solved by cutting benches on the slopes above the portal and proper stabilization measures like providing of stone ri p-rap etc. had to be adopted.

**d. Head Race Tunnel:**

Poor geological formation at certain stretches of the tunnel were encountered where steel rib supports, rock bolting and grouting had to be provided for ensuring the safety of the structure.

**e. Other Areas:**

There was geological problem at the intake apron and the foundation has to be excavated 1.5m below the projected foundation level to reach suitable foundation grade.

2 **Fluctuation of Construction of Power House**

The Transformer at Dam site was charged on August, 2016, at Surge Shaft on June, 2016 and at Power House on January, 2016. However, the Power Supply was highly fluctuating which posed problems in the operation of heavy equipment at the construction site.

3 **Floods**

In the monsoon periods, there were many instances of flash floods in the river Ganol leading to the frequent overtopping over the coffer dam and thereby affecting the

works on the Dam body. The temporary approach towards the Adit tunnel built across the river Ganol downstream of the Dam also got washed away on several occasions which led to the disruptions in the works of the Head Race Tunnel. The main disruption was due to incessant rain on the 29th & 30th September, 2017 where the water level of the Ganol River rose tremendously and submerged the steel bridge which was built across the river Canol upstream of the Darn and hence the Intake site was cut off. Land slide occurred at several locations including the left bank of the Dam axis. The approach road to the Adit was also cut off and due to landslides the entry towards HRT was also blocked. 2 (Two) LT poles supplying power to the Dam site were damaged and submersible pumps, panels and other equipment of the contractor were washed away including the aggregates stacked near the batching plant leading to large disruption of the works at the Dam and HRT.

4 **Financial Constraints**

On several occasions there were delays in Payment of Bills to the Contractors and Sub-Contractors which affected the progress of the works. Moreover, the Contractors have to procure major construction materials mostly from outside the state.

5 **Delay of Construction Drawings**

CWC and CEA, New Delhi were engaged as consultants for Design of Civil & E&M components of the Project. The delay in issuing and approving of construction drawings mostly of Dam, Power House & E&M by the consultants greatly affected the timely completion of the project.

6 **Pandemic Crisis**

Due to the Covid-19 pandemic in the month of March, 2020, the progress of works has been greatly affected as most of the labourers left the project site. The supply of construction of materials like sand, stone and reinforcement etc. are greatly affected and are not available in time due to the Pandemic lockdown. Although the

work could start only from August, 2020, with only 15 (fifteen) nos of labourers approximately, but mobilization of labourers and materials was difficult till further relaxation of the lockdown i.e, till November, 2020.

Moreover, due to the 2nd wave of the Pandemic, the Dam site was declared as Containment Zone by the District Authority from 8th May to 18th May, 2021 which has greatly affected the progress of work. Dam site area being the centric point of the project where the crusher plant, workshop etc. are situated, the supply of aggregates and construction materials to the different sites of the project has been greatly affected at that time.

### 4.4 Forest Clearance

Earlier, the Garo Hills district council Tura, has issued No Objection Certificate for implementation of Construction of 25 MW Ganol HEP for Power Generation in Meghalaya State vide their Memo no.CF.416/NoC/2005/3233-25,Tura dated 19th December 2006 and;

### 4.5 Environmental Clearance

The Government of India, Ministry of Environment and Forests, New Delhi in their letter dated 15.02.2007 has stated that, as per New EIA notification 2006 Hydro Electric Projects below 25 MW does not require Environmental Clearance.

### 4.6 Capital cost of the Project

The detailed cost estimates for the GANOL Small Hydro Project are based on the rates of various items of works adopted for several projects under implementation now in Meghalaya.

The approved Project cost at 2019 Price Level projected to be Rs.507.71 crore, which is based on the designs and drawings received after review from Central Water Commission. The Project cost estimate has been approved by the Board of Directors in its meeting held on 20.12.2023.

**Table 4.1 : Abstract of Project Cost Estimate of Ganol SHP**

| ABSTRACT OF REVISED COST ESTIMATE FOR GANOL SMALL HYDRO PROJECT (3X7.5 =22.5 MW), TURA, MEGHALAYA. | | | |
|---|---|---|---|
| **Sl. No.** | **Description of works** | **Approved Estimate 2014 (Rs in Lakhs)** | **Corrected Projected Cost as per 2019 Price level (Rs in Lakhs)** |
| **1** | **2** | **3** | **4** |
| **A** | **CIVIL WORKS** | | |
| **I** | **Direct Charges** | | |
| 1 | A. Preliminary | 452.76 | 312.24 |
| 2 | B. Land | 2766.07 | 467.22 |
| 3 | C. Works – | | |
| | - River Diverstion | 377.80 | 610.50 |
| | - Dam | 5146.13 | 8132.04 |
| | - Intake | 605.27 | 897.74 |
| | - Hydro Mechanical Works | 987.16 | 1226.49 |
| | - Instrumentation | 20.34 | 87.16 |
| | **Total of C - Works** | **7136.70** | **10953.93** |
| 4 | J. Power Plant Civil Works | | |
| | - Head Race Tunnel i/cDesilting Chamber &Adit | 1868.82 | 3816.76 |
| | - Surge Shaft | 756.31 | 2041.26 |
| | - Pressure Shaft & Penstock | 4131.94 | 9141.31 |
| | - Power House & Tail Race | 1722.75 | 3624.37 |
| | - Switchyard | 82.92 | 1283.88 |
| | - Hydro-Mechanical Works | 224.47 | 136.49 |
| | **Total of J - Power Plant Civil Works** | **8787.21** | **20044.08** |
| 5 | K. Buildings | 540.00 | 641.02 |
| 6 | M. Plantation | 20.79 | 7.46 |
| 7 | O. Miscellaneous | 330.07 | 639.97 |
| 8 | R. Communication | 1194.88 | 1838.62 |
| 9 | Q. Special T&P | 127.41 | 147.64 |
| 10 | X. Environment & Ecology | 375.90 | 453.25 |
| 11 | P. Maintenance during construction Actual | 105.69 | 158.00 |
| 12 | Y. Losses on stock @ 0.25% (of I - Works less A, B & Q) | 26.42 | 26.42 |
| | **Total of I - Works** | **21863.90** | **35689.85** |
| ii | Establishment | 987.07 | 2558.00 |
| iii | Tools & Plants | | |
| | | 128.70 | 10.00 |
| iv | Receipts & Recoveries | -43.67 | -133.99 |
| | **Total Direct Charges** | **22936.00** | **38123.86** |
| **II** | **INDIRECT CHARGES** | | |
| | (i) Audit & Accounts | 64.35 | 25.00 |
| | **Direct Charges** | **22936.00** | **38123.86** |
| | **Indirect Charges** | **64.35** | **25.00** |
| | **Total cost of civil works** | **23000.35** | **38148.86** |
| **B.** | **ELECTRICAL & MECHANICAL WORKS** | **7953.00** | **7769.12** |
| | **Total of A & B** | **30953.35** | **45917.98** |
| **C.** | **Escalation** | **2321.50** | **3000.00** |
| **D.** | **IDC** | **2368.50** | **1853.00** |
| | **TOTAL** | **Rs. 35,643.35** | **Rs. 50,770.98** |

### 4.7 Breakup of Capital Cost

| Sl.No | Particulars | Amount in Crore |
|---|---|---|
| A | Cost of Civil Works | 381.49 |
| B | Electrical & Mechanical works | 77.69 |
| C | Escalation | 30.00 |
| D | IDC | 18.53 |
| | **Total** | **507.71** |

Filing of the petition for Generation Tariff shall be considered as per the MSERC (Terms and Conditions for Determination of Generation Tariff from Renewable Sources) Regulations 2014 read with 1st Amendment 2022.

**The components of tariff are analyzed in the following paragraphs.**

### 4.8 Calculation of Generic Tariff for Ganol

As explained earlier MePGCL has adopted the methodology of generic tariff for the Ganol Project in this Petition. All the provisions of the 2014 RE Tariff Regulations have been followed for the purpose of calculation of the components of AFC. The assumptions adopted for the purpose of calculation are as under:

#### 4.8.1 Assumptions

| Assumptions | Legend | Value | Remarks |
|---|---|---|---|
| Project Capacity | MW | 22.5 | |
| Project Cost | | | |
| Normative Project Cost | Rs Lakh/MW | 1200 | Regulation 31(2) Amended |
| Normative Project Cost | Rs. Cr | 270 | |
| Debt (%) | % | 70% | Regulation 15 (b) |
| Equity (%) | % | 30% | Regulation 15 (b) |
| Debt Amount | Rs. Cr | 189 | |
| Equity Amount | Rs. Cr | 81 | |
| Useful Life | Years | 40 | Regulation 2.1(37 b) |
| Rate of Interest | % | 9.28% | Base Rate for First 6 months of 2022-23- Regulation 18 (b) |
| Loan Tenure | Years | 12 | Regulation 18 |
| Depreciation | % | 5.83% | Regulation 19(2) |
| Return on Equity | % | 16% | Regulation 20(2) |
| WACC | % | 9.13% | |
| CUF | % | 45% | Regulation 32 |
| Aux Consumption | % | 1% | Regulation 33 |
| O&M Expenses | Rs. Lakh/MW | 34.47 | Regulation 35(1) |
| O&M Escalation | % | 6% | |
| Hours for Operation | Nos | 8760 | |
| O&M Expenses for WC | Months | 1 | Regulation 21 (1) |

| | | | |
|---|---|---|---|
| Receivables | Months | 2 | Regulation 21 (1) |
| Maintenance Spares | % | 15% | Regulation 21 (1) |
| Interest on Working Capital | % | 9% | Regulation 21 (3) |

### 4.8.2 Capacity Utilization Factor and Auxiliary Consumption

**Petitioner's Submission**

As per Regulation 32 of the 2014 RE Tariff Regulations:

*32. Capacity Utilization Factor*

*"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."*

In line with the provisions of the above Regulations the Normative CUF for Ganol SHP has been considered as 45% for the purpose of calculation of Levellized Tariff.

Further, Regulation 33 of the 2014 RE Tariff Regulations:

*"33. Auxiliary Consumption*

*Normative auxiliary consumption for Small hydro projects shall be 1.0 %."*

Accordingly, the auxiliary consumption has been considered as 1% for the purpose of calculation of levellized tariff for Ganol SHP.

### 4.8.3 Capital Cost

**Petitioner's Submission**

As per the Regulation 31(2) of the 2014 RE Tariff Regulations as amended vide notification dated 23rd June 2022.

*"32(2) The normative capital cost for Small Hydro Projects shall be as follows:*

| Size of Project | Capital Cost (Rs. Lakh/MW) |
|---|---|
| Below 5 MW | 1500 |
| 5 MW to 25 MW | 1200 |

*(b) The normative capital cost shall be increased annually by an escalation factor equal to the annual rate of inflation on the Wholesale Price Index for all commodities from 2023-24 onward."*

Since, Ganol Project has been commissioned in August 2023, no escalation on normative capital cost in the above Regulations has been considered and accordingly the normative capital cost of Rs. 1200 Lakh/MW has been considered for the purpose of calculation of the fixed cost components. The normative project cost for Ganol Project in terms of Rs. Crore comes out to be Rs. 270 cr.

MePGCL requested the Commission to approve the normative capital cost of the Ganol Project as Rs. 270 Cr.

**Commission's Analysis**

Commission considers Capital cost of the project at Rs.1200 Lakh per MW as per the Regulation 35.1 of MSERC (Terms and conditions for determination of Generation Tariff from Renewable Energy Sources) Regulations 2014 read with 1st Amendment dated 23rd June 2022.

**Table 4.2 : Computation of Capital Cost**

| | | |
|---|---|---|
| 1 | Ganol SH Project Installed Capacity (3x7.5) 22.5 MW | 22.5 MW |
| 2 | Normative Cost per MW | Rs.1200 Lakh per MW |
| 3 | **Capital cost of the project** | **Rs.270.00 Crore** |

**Commission approves Capital Cost of the Ganol SH Project at Rs.270.00 Crore on normative basis.**

### 4.8.4 Debt Equity Ratio

**Petitioner's Submission**

Regulation 15 of the 2014 RE Tariff Regulations states that:

15. Levellized Tariff

*"a. Levellized tariff is calculated by carrying out levellisation for 'useful life' of each technology considering the discount factor for time value of money.*

*b. The discount factor considered for this purpose is equal to the Post Tax weighted average cost of the capital on the basis of normative debt: equity ratio (70: 30) specified in the Regulations. Considering the normative debt equity ratio and weighted average of the post-tax rates for interest and equity component, the discount factor is calculated."*

Accordingly, MePGCL has considered the debt: equity ratio of 70:30 for the purpose of calculation of the levellized tariff for Ganol SHP. MePGCL requests Commission to approve the same.

**Commission's Analysis**

**Commission considers the debt equity components of the project as given below.**

| | | |
|---|---|---|
| 1 | Ganol SH Project Installed Capacity (3x7.5) 22.5 MW | 22.5 MW |
| 2 | Normative Cost per MW | Rs.1200 Lakh per MW |
| 3 | **Capital cost of the project** | **Rs.270.00 Crore** |
| 4 | **Debt @ 70%** | **Rs. 189.00 Cr** |
| 5 | **Equity @ 30%** | **Rs. 81.00 Cr** |

**Commission considers the debt equity ratio shall be 70:30 for determination of Generic Tariff as per the Regulation 17 of the RE Regulations 2014.**

### 4.8.5 Loan Tenure and Rate of Interest on Loan

**Petitioner's Submission**

Regulation 18 of the 2014 RE Tariff Regulations specifies that:

*"18. Interest and Finance Charges on Loan Capital*

*(1) Loan tenure for the purpose of determination of tariff, loan tenure of 12 years shall be considered.*

*(2) Interest Rate*

*a) The loans arrived at in the manner indicated above in Regulation 17 shall be considered as gross normative loan for calculation of interest on loan. The normative loan outstanding as on April 1$^{st}$ of every year shall be worked out by deducting the cumulative repayment up to March 31$^{st}$ of previous year from the gross normative loan.*

*b) For the purpose of computation of tariff, the normative interest rate shall be considered as average State Bank of India Base Rate prevalent during the first six months of the previous year plus 150 basis points.*

*c) Notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed. "*

Accordingly, MePGCL has considered 70% of the normative project cost as loan amount for a tenure of 12 years and the depreciation calculated as per the provisions of 2014 RE Tariff Regulations has been considered as normative Repayment.

Further, the average State Bank of India base rate during the first six months of previous years comes out to be 7.78% hence the rate of interest has been considered as 9.28% i.e., (SBI base rate plus 150 basis points).

MePGCL requested the Commission to approve the tenure, loan amount and rate of interest as stated above.

**Commission's Analysis**

As per Regulation 18 of RE Regulations 2014 -

*"18 Interest and finance charges on loan capital*

1) *Loan tenure*

   *For the purpose of determination of tariff, loan tenure of 12 years shall be considered.*

2) *Interest rate*

   a) *The loans arrived at in the manner indicated above in Regulation 18 shall be considered as gross normative loan for calculation of interest on loan. The normative loan outstanding as on April 1st of every year shall be worked out by deducting the cumulative repayment up to March 31st of previous year from the gross normative loan.*

   b) *For the purpose of computation of tariff, the normative rate shall be considered as average State Bank of India Base Rate prevalent during the first six months of the previous year plus 150 basis points.*

   c) *Notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the depreciation allowed.*

Petitioner has submitted in their letter dated 19.02.2024, the assumption for computation of ARR.

*" The Petitioner has adopted Rate of interest at 9.28% for computation of Interest on Loan capital"*

**Rate of Interest for Loan Component is considered at 9.28 % for RE Tariff.**

Petitioner has availed PFC loan for Ganol stage I SHP for Rs.173.11 Crore as reported in the audited accounts for FY 2022-23, Repayment has been considered as per the RE Regulations for 12 years.

Petitioner has projected Interest and Finance charges at Rs.16.81 Core vide table no.6 of the petition.

The rate of Interest on Loan capital is adopted at 9.28 % in the assumptions projected.

Computation of Interest on Loan capital is considered as depicted in the table below.

**Table 4.3 : Computation of Interest on Loan Capital**

| Sl.no | Particulars | in Rs.Cr |
|---|---|---|
| 1 | Project Cost | 270.00 |
| 2 | Normative Debt @ 70% | 189.00 |
| 3 | Equity @ 30% | 81.00 |
| 4 | Actual Loan Availed | 173.11 |
| 5 | Less: Repayment (173.11/12) | 14.42 |
| 6 | Closing Loan | 158.68 |
| 7 | Average Loan | 165.89 |
| 8 | Rate of Interest | 9.28% |
| 9 | Interest cost | 15.39 |

**Commission considers Interest on Loan Capital at Rs.15.39 Crore for Generic Tariff.**

### 4.8.6 Return On Equity

**Petitioner's Submission**

Regulation 20 of the 2014 RE Tariff Regulations specifies that:

*"20. Return on Equity*

*(1) The value base for the equity shall be 30% of the capital cost for generic tariff determination or actual equity (in case of project specific tariff determination) as determined under Regulation 17.*

*(2) The normative Return on Equity shall be: 16% Provided that in case of projects commissioned after notification of these regulations an additional return of 1.0% shall be allowed if such projects are completed within the timeline approved in the sanctioned Detail Project Report and within the original sanctioned project cost without cost overrun."*

Accordingly, MePGCL has considered the 30% of the normative project cost as Equity component and has considered the rate of return on equity of 16%. MePGCL requested Commission to approve the same.

**Commission's Analysis**

Regulation 20 of the 2014 RE Tariff Regulations specifies that:

*"20. Return on Equity*

*(1) The value base for the equity shall be 30% of the capital cost for generic tariff determination or actual equity (in case of project specific tariff determination) as determined under Regulation 17.*

*(2) The normative Return on Equity shall be: 16% Provided that in case of projects commissioned after notification of these regulations an additional return of 1.0% shall be allowed if such projects are completed within the timeline approved in the sanctioned Detail Project Report and within the original sanctioned project cost without cost overrun."*

The Return on Equity shall be allowed at 16% on actual equity infused for Rs.54.62 Crore projected vide table no.04 of the petition for determination of generic tariff.

Accordingly the Return on Equity is computed as depicted in the table below.

**Table 4.4 : Computation of Return on Equity for RE Tariff**

| Sl. | Particulars | Filed by Petitioner | Approved by the Commission |
|---|---|---|---|
| 1 | Normative Capital Cost considered for RE Tariff | 270.00 | 270.00 |
| 2 | Less: Grants | - | - |
| 3 | Net Capital Cost | 270.00 | 270.00 |
| 4 | Debt component (70% of GFA) | 189.00 | 189.00 |
| 5 | Equity component (30% of GFA) | 81.00 | 54.62* |
| 6 | Rate of Interest | 16% | 16% |
| 7 | **Return on Equity for RE Tariff** | **12.96** | **8.74** |

**** Actual Equity claimed by petitioner in Table no.4 of the petition.***

**Commission Considers Return on Equity at Rs.8.74 Crore for RE Tariff.**

### 4.8.7 Depreciation

**Petitioner's Submission**

Regulation 19 of 2014 RE Tariff Regulation specifies the following:

*"19. Depreciation*

*For the purpose of tariff determination, depreciation shall be computed in the following manner,*

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

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

*(2) Annual Depreciation shall be based on ''Differential Depreciation Approach' using 'Straight Line Method' over two distinct periods comprising loan tenure and period beyond loan tenure over useful life. The depreciation rate for the first 12 years of the Tariff Period shall be 5.83% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 13$^{th}$ year onwards.*

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

Accordingly, MePGCL has considered the rate of depreciation of 5.83% for the first 12 years of operation and the balance depreciation has been spread over the balance useful life of the project and projected the depreciation at Rs.15.74 Crore.

MePGCL requested the Commission to approve the methodology adopted which is in line with the Regulations.

**Commission's Analysis**

As per Regulation 19 of the RE Regulations, 2014, the depreciation shall be computed in the following manner,

a) *The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission.*

   *(1) The salvage value of the asset shall be considered as 10% and Depreciation shall be allowed up to maximum of 90% of the Capital cost of the asset.*

*(2) Annual Depreciation shall be based on "Differential Depreciation Approach "using Straight Line Method over two distinct period comprising loan tenure and period beyond loan tenure over useful life. The depreciation rate for the first 12 years of the Tariff Period shall be 5.83% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from the 13th year onwards.*

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

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

Since land is not depreciable, depreciation on land cost excluded from the project cost.

**Table 4.5 : Computation of Depreciation for RE Tariff**

| Particulars | Rs..in Cr |
|---|---|
| **Normative Project Cost** | **270.00** |
| Project cost excl. Land cost (270-4.67) | **265.33** |
| **90% of Project cost** | 238.80 |
| **Rate of Dep** | **5.83%** |
| **Depreciation** | **13.92** |

**Commission Considers Depreciation at Rs.13.92 Crore for RE Tariff**

### 4.8.8 Operation and Maintenance Expenses

**Petitioner's Submission**

As Per Regulation 35(1) of 2014 RE Tariff Regulations as amended vide notification dated 23rd June 2022:

*35(1) The normative O&M expenses for small hydro projects shall be as given below:*

| *Size of Project* | *O&M Expenses (Rs. Lakh/MW)* |
|---|---|
| *Below 5 MW* | *45.96* |
| *5 MW to 25 MW* | *34.47* |

(2) The normative O&M expenses shall be escalated at the rate of 5.72% per annum over the tariff period for the determination of levellized tariff.

Accordingly, the normative O&M expenses for the first year has been claimed as Rs. 34.47 lakh/MW and the escalation of 5.72% has been considered over the next 40 years. MePGCL projected O&M expenses at Rs.7.76 Crore

MePGCL requests Commission to approve the O&M expenses as claimed in the Petition.

**Commission's Analysis**

As per Regulation 22 read with 35 of the MSERC (Terms & Conditions for Determination of the Generation Tariff for Renewable Energy Sources) Regulations, 2014 (1st *Amendment), the Operation and Maintenance Expenses are computed as below:*

*(1) 'Operation and Maintenance or O&M expenses' shall comprise the following,*

*(a) Repair and maintenance (R&M),*

*(b) Establishment including employee expenses, and*

*(c) Administrative and general expenses including insurance.*

*(2) Operation and maintenance expenses shall be determined for the Tariff Period based on normative O&M expenses specified by the Commission subsequently in these regulations for the first Year of Control Period.*

*(3) Normative O&M expenses allowed during first year of the Control Period under these regulations shall be escalated at the rate of 5.72% per annum to determine the O&M expenses for different years of the Tariff Period.*

Normative O&M expenses allowed under these regulations are escalated at the rate of 5.72 % per annum for the tariff period for the purpose of determination of levellised tariff.

**Table 4.6 : Computation of O&M expenses for RE Tariff**

| S.no | Size of project | O&M Expenses |
|---|---|---|
| 1 | Normative O&M Expenses | 34.47 Lakh/MW |
| 2 | Project Capacity | 22.5MW |
| C 3 | O&M Expenses for RE Tariff (1x2) | **776 Lakh** |

**Commission considers O&M expenses at Rs.7.76 Crore for RE Tariff.**

### 4.8.9 Interest on Working Capital

**Petitioner's Submission**

Regulation 21(1) of the 2014 RE Tariff Regulations prescribes the methodology of calculation of working capital as below:

*21. Interest on Working Capital*

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

*a) Operation & Maintenance expenses for one month;*

*b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilisation Factor (CUF);*

*c) Maintenance spare @ 15% of operation and maintenance expenses;*

Further Regulation 21(3) states that:

*"(3) Rate of Interest on Working Capital shall be at interest rate equivalent to average State Bank of India Base Rate prevalent during the first six months of previous year plus 100 basis points."*

Accordingly, the rate of interest on working capital comes out to 8.78%.

MePGCL has projected the Interest on Working Capital at Rs.0.95 Crore.

## Commission's Analysis

As per Regulation 21 of MSERC RE Regulations 2014 -

*"**21 Interest on Working Capital***

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

*a) Operation & Maintenance expenses for one month;*

*b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilization Factor (CUF) 45%;"*

*c) Maintenance spare @ 15% of operation and maintenance expenses;*

*(3) Rate of Interest on Working Capital shall be at interest rate equivalent to average State Bank of India Base Rate prevalent during the first six months of previous year plus 100 basis points.*

Petitioner has submitted that rate of Interest on working capital is considered at 9% in the additional information dated 19.02.2024. Accordingly Interest on working capital is computed as detailed in the table below.

**Table 4.7 : Computation of Interest on Working Capital for RE Tariff**

| Particulars | Amount in Cr |
|---|---|
| O&M for 1 Month (Rs.7.76 Cr/12) | 0.64 |
| Maintenance Spares @15% of O&M expenses | 1.16 |
| Receivables for 2 Months of Energy Charges (45.81/12*2) | 7.63 |
| **Total Working Capital Requirement** | **9.43** |
| Interest Rate (%) as per Board Resolution | 9.00 % |
| **Interest on Working Capital** | **0.85** |

**Commission considers Interest on Working Capital at Rs. 0.85 Crore for RE Tariff.**

## 4.9 Annual Revenue Requirement (ARR)

Commission has analyzed the petition filed by the licensee for approval of RE Tariff for Ganol SHP with reference to the MSERC RE Regulations 2014 and approved Annual Fixed Charges as depicted in the table below.

**Table 4.8 : Computation of AFC for RE Tariff of Ganol SHP**

**(Rs.Cr)**

| Particulars | Filed by Petitioner vide table no.6 of petition | Approved for RE Tariff |
|---|---|---|
| Interest on Loan capital | 16.81 | 15.39 |
| Depreciation | 15.74 | 13.92 |
| O&M Expenses | 7.76 | 7.76 |
| Interest on working capital | 0.95 | 0.85 |
| Return on Equity | 12.96 | 8.74 |
| **Total Annual Fixed Cost** | **54.22** | **46.66** |

**Commission Approves AFC at Rs.46.66 Crore for RE Tariff.**

# 5. Determination of Levellised Tariff

## 5.1 Form of Template for Small Hydro Project Parameter Assumptions

| Sr. No. | Assumption Head | Sub-Head (1) | Sub-Head (2) | Unit | Parameter Values |
|---|---|---|---|---|---|
| 1 | Power Generation | Capacity | Installed Power Generation Capacity | MW | 22.5 |
| | | | Capacity Utilization Factor | % | 45% |
| | | | Commercial Operation Date | mm / yyyy | 08/2023 |
| | | | Useful Life | Years | 40 |
| 2 | Project Cost | Capital Cost | Normative capital cost | Rs. lakh / MW | 1200 |
| | | | Capital Cost | Rs. lakh | 27000 |
| | | | Capital Subsidy, if any | Rs. lakh | - |
| | | | Net Capital Cost | Rs. lakh | 27000 |
| 3 | Financial Assumptions | Debt Equity | Tariff Period | Years | 40 |
| | | | Debt | % | 70 |
| | | | Equity | % | 30 |
| | | | Total Debt Amount | Rs. lakh | 18900 |
| | | | Total Equity Amount | Rs. lakh | 8100 |
| | | Debt Component | | | |
| | | | Loan Availed | Rs. lakh | 17311 |
| | | | Moratorium Period | Years | - |
| | | | Repayment Period (include Moratorium) | Years | 12 |
| | | | Interest Rate | % | 9.28 |
| | | Equity Component | | | |
| | | | Equity amount | Rs. lakh | 5462 |
| | | | Return on Equity for First 12 years | % P.a | 16 |
| | | | Return on Equity 13th year onwards | % P.a | 16 |
| | | | Discount Rate | % | 1 |
| | | Depreciation | Capital Cost | Rs.Lakh | 27000 |
| | | | Depreciation Rate for first 12 years | % | 5.83 |
| | | | Depreciation Rate 13th year onwards | % | Spread over 28 years |
| | | Incentives | Generation Based incentives, if any | Rs. lakh P.a | - |
| | | | Period for GBI | Years | - |
| 4 | Operation & Maintenance | Normative O&M Expenses | | Rs. lakh / MW | 34.47 |
| | | O&M Expenses per annum | | Rs. lakh | 776 |
| | | Escalation factor for O&M Expenses | | % | 5.72 |
| 5 | Working Capital | O&M Expenses | | Months | 1 |
| | | Maintenance Spare (% of O&M expenses) | | % | 15 |
| | | Receivables | | Months | 2 |
| | | Rate of Interest | | % | 9.00 |

## 5.2 Levelised Tariff

The levelised Tariff shall be as per the form of template is drawn below for the useful life of project for 40 years as per RE Regulations 2014 read with first Amendment 2022.

## Form of Template for Ganol SHP Levelised Tariff

| **Units of Generation** | **Yr-1** | **Yr-2** | **Yr-3** | **Yr-4** | **Yr-5** | **Yr-6** | **Yr-7** | **Yr-8** | **Yr-9** | **Yr-10** | **Yr-11** | **Yr-12** | **Yr-13** | **Yr-14** | **Yr-15** | **Yr-16** | **Yr-17** | **Yr-18** | **Yr-19** | **Yr-20** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Installed Capacity (MW) | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 | 22.5 |
| Gross Generation | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 | 88.7 |
| Auxiliary Consumption (1%) | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Net Generation | 87.81 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 | 87.8 |
| | | | | | | | | | | | | | | | | | | | | |
| **Tariff Components** | | | | | | | | | | | | | | | | | | | | |
| Depreciation (Cr) | 13.92 | 13.92 | 13.92 | 13.92 | 13.92 | 13.92 | 13.92 | 13.92 | 13.92 | 13.92 | 13.92 | 13.92 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 |
| Interest on Loan (Cr) | 15.40 | 14.06 | 12.72 | 11.38 | 10.04 | 8.70 | 7.36 | 6.02 | 4.69 | 3.35 | 2.01 | 0.67 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Return on Equity (Cr) | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 |
| O&M Expenses (Cr) | 7.76 | 8.20 | 8.67 | 9.16 | 9.69 | 10.24 | 10.83 | 11.45 | 12.10 | 12.79 | 13.53 | 14.30 | 15.12 | 15.98 | 16.90 | 17.86 | 18.89 | 19.97 | 21.11 | 22.32 |
| Interest on Working Capital (Cr) | 0.85 | 0.85 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.84 | 0.85 | 0.85 | 0.86 | 0.86 | 0.73 | 0.76 | 0.79 | 0.83 | 0.86 | 0.90 | 0.94 | 0.99 |
| **Total AFC (Cr)** | **46.66** | **45.76** | **44.89** | **44.04** | **43.23** | **42.44** | **41.69** | **40.98** | **40.30** | **39.65** | **39.05** | **38.50** | **28.10** | **28.99** | **29.94** | **30.94** | **32.00** | **33.12** | **34.30** | **35.55** |
| **AFC Rs./kWh** | **5.31** | **5.21** | **5.11** | **5.02** | **4.92** | **4.83** | **4.75** | **4.67** | **4.59** | **4.52** | **4.45** | **4.38** | **3.20** | **3.30** | **3.41** | **3.52** | **3.64** | **3.77** | **3.91** | **4.05** |
| | | | | | | | | | | | | | | | | | | | | |
| **Per Unit Tariff Components** | | | | | | | | | | | | | | | | | | | | |
| PU Depreciation (Rs./Ps) | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| PU Interest on Loan (Rs./Ps) | 0.18 | 0.16 | 0.14 | 0.13 | 0.11 | 0.1 | 0.08 | 0.07 | 0.05 | 0.04 | 0.02 | 0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PU Return on Equity (Rs./Ps) | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| PU O&M expenses (Rs./Ps) | 0.09 | 0.09 | 0.1 | 0.1 | 0.11 | 0.12 | 0.12 | 0.13 | 0.14 | 0.15 | 0.15 | 0.16 | 0.17 | 0.18 | 0.19 | 0.2 | 0.22 | 0.23 | 0.24 | 0.25 |
| PU Interst on Working Capital | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| PU Tariff Components (Rs./Ps) | 0.53 | 0.52 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.44 | 0.32 | 0.33 | 0.34 | 0.35 | 0.36 | 0.38 | 0.39 | 0.4 |
| | | | | | | | | | | | | | | | | | | | | |
| **Levelised Tariff** | | | | | | | | | | | | | | | | | | | | |
| Discount Factor | 1 | 0.92 | 0.84 | 0.77 | 0.71 | 0.65 | 0.6 | 0.55 | 0.5 | 0.46 | 0.42 | 0.39 | 0.35 | 0.33 | 0.3 | 0.27 | 0.25 | 0.23 | 0.21 | 0.19 |
| AFC | 46.7 | 42 | 37.8 | 34 | 30.6 | 27.6 | 24.8 | 22.4 | 20.2 | 18.2 | 16.5 | 14.9 | 9.96 | 9.43 | 8.93 | 8.46 | 8.03 | 7.62 | 7.24 | 6.88 |
| Generation | 87.8 | 80.5 | 73.9 | 67.8 | 62.1 | 57 | 52.3 | 48 | 44 | 40.3 | 37 | 33.9 | 31.1 | 28.6 | 26.2 | 24 | 22 | 20.2 | 18.5 | 17 |
| | | | | | | | | | | | | | | | | | | | | |

| **Units of Generation** | **Yr-21** | **Yr-22** | **Yr-23** | **Yr-24** | **Yr-25** | **Yr-26** | **Yr-27** | **Yr-28** | **Yr-29** | **Yr-30** | **Yr-31** | **Yr-32** | **Yr-33** | **Yr-34** | **Yr-35** | **Yr-36** | **Yr-37** | **Yr-38** | **Yr-39** | **Yr-40** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Installed Capacity (MW) | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 | 22.50 |
| Gross Generation | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 | 88.70 |
| Auxiliary Consumption (1%) | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Net Generation | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 | 87.81 |
| | | | | | | | | | | | | | | | | | | | | |
| **Tariff Components** | **Yr-21** | **Yr-22** | **Yr-23** | **Yr-24** | **Yr-25** | **Yr-26** | **Yr-27** | **Yr-28** | **Yr-29** | **Yr-30** | **Yr-31** | **Yr-32** | **Yr-33** | **Yr-34** | **Yr-35** | **Yr-36** | **Yr-37** | **Yr-38** | **Yr-39** | **Yr-40** |
| Depreciation (Cr) | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 | 3.51 |
| Interest on Loan (Cr) | 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 |
| Return on Equity (Cr) | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 | 8.74 |
| O&M Expenses (Cr) | 23.59 | 24.94 | 26.37 | 27.88 | 29.47 | 31.16 | 32.94 | 34.82 | 36.81 | 38.92 | 41.15 | 43.50 | 45.99 | 48.62 | 51.40 | 54.34 | 57.45 | 60.73 | 64.21 | 67.88 |
| Interest on Working Capital (Cr) | 1.03 | 1.08 | 1.13 | 1.19 | 1.24 | 1.31 | 1.37 | 1.44 | 1.51 | 1.58 | 1.67 | 1.75 | 1.84 | 1.93 | 2.03 | 2.14 | 2.25 | 2.37 | 2.50 | 2.63 |
| **Total AFC (Cr)** | **36.87** | **38.27** | **39.75** | **41.31** | **42.96** | **44.71** | **46.56** | **48.51** | **50.57** | **52.75** | **55.06** | **57.50** | **60.08** | **62.80** | **65.68** | **68.73** | **71.95** | **75.35** | **78.95** | **82.76** |
| **AFC Rs./kWh** | **4.20** | **4.36** | **4.53** | **4.70** | **4.89** | **5.09** | **5.30** | **5.52** | **5.76** | **6.01** | **6.27** | **6.55** | **6.84** | **7.15** | **7.48** | **7.83** | **8.19** | **8.58** | **8.99** | **9.42** |
| **Per Unit Tariff Components** | | | | | | | | | | | | | | | | | | | | |
| PU Depreciation (Rs./Ps) | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 |
| PU Interest on Loan (Rs./Ps) | 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 |
| PU Return on Equity (Rs./Ps) | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| PU O&M expenses (Rs./Ps) | 0.27 | 0.28 | 0.30 | 0.32 | 0.34 | 0.35 | 0.38 | 0.40 | 0.42 | 0.44 | 0.47 | 0.50 | 0.52 | 0.55 | 0.59 | 0.62 | 0.65 | 0.69 | 0.73 | 0.77 |
| PU Interst on Working Capital | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 | 0.03 |
| PU Tariff Components (Rs./Ps) | 0.42 | 0.44 | 0.45 | 0.47 | 0.49 | 0.51 | 0.53 | 0.55 | 0.58 | 0.60 | 0.63 | 0.65 | 0.68 | 0.72 | 0.75 | 0.78 | 0.82 | 0.86 | 0.90 | 0.94 |
| **Levelised Tariff** | | | | | | | | | | | | | | | | | | | | |
| Discount Factor | 0.18 | 0.16 | 0.15 | 0.14 | 0.13 | 0.12 | 0.11 | 0.10 | 0.09 | 0.08 | 0.07 | 0.07 | 0.06 | 0.06 | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 | 0.03 |
| AFC | 6.55 | 6.23 | 5.94 | 5.66 | 5.40 | 5.15 | 4.92 | 4.70 | 4.50 | 4.30 | 4.12 | 3.95 | 3.78 | 3.63 | 3.48 | 3.34 | 3.21 | 3.08 | 2.96 | 2.85 |
| Generation | 15.59 | 14.30 | 13.12 | 12.03 | 11.04 | 10.12 | 9.28 | 8.52 | 7.81 | 7.16 | 6.57 | 6.03 | 5.53 | 5.07 | 4.65 | 4.27 | 3.91 | 3.59 | 3.29 | 3.02 |
| | | | | | | | | | | | | | | | | | | | | |
| **Levellized Tariff** | **4.77** | | | | | | | | | | | | | | | | | | | |

Sd/-
**Shri. R.K. Soni, District Judge (Retd.)**
**(Member)**

Sd/-
**Shri. P.W. Ingty, IAS (Retd)**
**(Chairman)**

**Annexure-I**

Annexure - I FUND RECEIPT AGAINST CONSTRUCTION OF GANOL SMALL HYDRO PROJECT

| Sl. No. | Particulars | Letter/Sanction No. & Date | Loan | Grant | Equity | Total | Date of Credit | Remarks |
|---|---|---|---|---|---|---|---|---|
| 1 | Const. of Ganol | No.PE.129/2005/136 Dt.22.01.2009 | | | 11,56,79,000.00 | 11,56,79,000.00 | Dt.06.02.2009 | |
| 2 | Ganol (NLCPR) | No.PE.129/2005/Pt.I/94 Dt.28.01.2011 | 1,28,53,000.00 | | | 1,28,53,000.00 | Dt.11.02.2011 | |
| 3 | Const. of Ganol | No.PE.129/2005/Pt.III/22 Dt.31.03.2014 | 3,88,89,000.00 | | 35,00,00,000.00 | 38,88,89,000.00 | Dt.13.05.2014 | |
| 4 | Const. of Ganol | No.PE.129/2005/Pt.III/53 Dt.30.03.2015 | | | 23,00,00,000.00 | 23,00,00,000.00 | Dt.29.05.2015 | |
| 5 | Const. of Ganol | Same as Above | | | 2,00,00,000.00 | 2,00,00,000.00 | Dt.29.05.2015 | |
| 6 | Const. of Ganol | No.POWER.129/2005/Pt.III/99 Dt.28.03.2016 | 34,50,00,000.00 | | | 34,50,00,000.00 | Dt.31.03.2016 | |
| 7 | Const. of Ganol | No.POWER.129/2005/Pt.I/527 Dt.06.12.2016 | 13,30,000.00 | | 1,19,75,000.00 | 1,33,05,000.00 | Dt.23.12.2016 | |
| 8 | Const. of Ganol | No.POWER.129/2005/Pt.I/526 Dt.06.12.2016 | 1,15,20,000.00 | | | 1,15,20,000.00 | Dt.23.12.2016 | |
| 9 | Const. of Ganol | Same as Above | | | 8,36,82,000.00 | 8,36,82,000.00 | Dt.23.12.2016 | |
| 10 | Const. of Ganol | Same as Above | | | 2,00,00,000.00 | 2,00,00,000.00 | Dt.15.02.2017 | |
| 11 | Const. of Ganol (NABARD) | No.POWER.129/2005/Pt.III/266 Dt.10.08.2018 | 26,24,32,000.00 | | | 26,24,32,000.00 | Dt.16.08.2018 | |
| 12 | Const. of Ganol | No.POWER.129/2005/Pt-IV/25 Dt.30.03.2019 | | | 54,25,78,000.00 | 54,25,78,000.00 | Dt.17.04.2019 | |
| 13 | Const. of Ganol | No.POWER.123/2020/113 Dt.04.11.2020 | 10,00,00,000.00 | | | 10,00,00,000.00 | Dt.05.11.2020 | |
| 14 | Const. of Ganol | No.POWER.123/2020/131 Dt.14.12.2020 | 10,00,00,000.00 | | | 10,00,00,000.00 | Dt.21.12.2020 | 40,00,00,000.00 |
| 15 | Const. of Ganol | Same as Above | 9,00,00,000.00 | | | 9,00,00,000.00 | Dt.05.03.2021 | |
| 16 | Const. of Ganol | Same as Above | 10,00,00,000.00 | | | 10,00,00,000.00 | Dt.24.02.2021 | |
| 17 | Const. of Ganol | Same as Above | 11,00,00,000.00 | | | 11,00,00,000.00 | Dt.31.03.2021 | |
| 18 | Const. of Ganol | No.POWER.43/2012/40 Dt.09.12.2021 | 50,00,00,000.00 | | | 50,00,00,000.00 | Rs.20,00,00,000.00 on Dt.15.12.2021 & 30,00,00,000.00 on 23.12.2021 | |
| 19 | Const. of Ganol | No.POWE/0079/2223/GEN Dt.22.11.2022 | | | 15,00,00,000.00 | 15,00,00,000.00 | Dt.08.12.2022 | |
| 20 | Const. of Ganol | No.POWE/0079/2223/GEN Dt.30.03.2023 | | | 10,00,00,000.00 | 10,00,00,000.00 | Dt.30.03.2023 | |
| | **Sub-Total (A)** | | **1,67,20,24,000.00** | - | **1,62,39,14,000.00** | **3,29,59,38,000.00** | | |
| | | | | | | | | |
| 21 | Loan from PFC Ltd. | | 1,73,11,00,000.00 | - | | 1,73,11,00,000.00 | | |
| 22 | Grant/Subsidy from MNRE | | | 18,00,00,000.00 | | 18,00,00,000.00 | | |
| | | | | | | - | | |
| | Grand Total | | 3,40,31,24,000.00 | 18,00,00,000.00 | 1,62,39,14,000.00 | 5,20,70,38,000.00 | | |

**Annexure-II**

**List of Participants in the Public Hearing on Tariff for Ganol SHP under RE Regulations filed by MePGCL**

**Date: 5th March 2024|Heard through video conferencing| Time: 13:00 Hours**

**Present :**

1. Shri. P. W, Ingty, IAS (Retd), Chairman, MSERC.
2. Shri. R.K. Soni, District Judge (Retd.), Member, MSERC.
3. Shri. E. Slong, Secretary, MSERC.

**MeECL/MePGCL**

1. Shri. R. Majaw, Director Generation, MePGCL.
2. Shri. H.W.L.Mawnai, Chief Engineer (M&SH),MePGCL.
3. Shri. B. Wahlang, Chief Engineer(HP&HC),MePGCL.
4. Shri. H.F.Shangpliang,Chief Engineer(Generation),MePGCL
5. Shri. G.S.Mukherjee, Company Secretary, MeECL.
6. Shri. K. Thangkhiew, Additional Chief Engineer(C),O/o the Director Generation, MePGCL
7. Smti. M.Lyngdoh, Superintending Engineer(C),P&RM, O/o the Director Generation, MePGCL.
8. Shri.L. Pyngrope, Superintending Engineer(C),PM,O/o the Director Generation,MePGCL.
9. Shri. R. Laloo, Sr. Accounts Officer,MeECL.
10. Smti.B. Nongkhlaw, Account Officer, MeECL.
11. Smti. L. Kharpran, Account Officer,MeECL.
12. Shri. G.A.Dkhar, Law Officer,MeECL.
13. Smti. B. Lyngdoh Mawphlang,AEE(C), O/o the Director Generation MePGCL.
14. M/s Mercados Energy Markets India Pvt. Ltd. Consultant, MePGCL.
15. M/s Dentons Link Legal.

**Byrnihat Industries Association (BIA)**

1. Shri. Ghanshyam. Thakkar, Consultant BIA.
2. Smti. Mandakini. Ghosh, Advocate BIA.