

**SMP – 36/2022**



## **Madhya Pradesh Electricity Regulatory Commission**

**5th Floor, "Metro Plaza", Bittan Market, Bhopal - 462016**

**PRESENT:**

**S.P.S Parihar, Chairman**

**Mukul Dhariwal, Member**

**Gopal Srivastava, Member (Law)**

**IN THE MATTER OF:**

**DETERMINATION OF TARIFF FOR PROCUREMENT OF POWER BY  
DISTRIBUTION LICENSEES FROM BIOMASS BASED POWER  
PROJECTS IN THE STATE OF MADHYA PRADESH**

**September 2022**

## ORDER

(Passed on this day of 13<sup>th</sup> September' 2022)

### 1 Preamble

In exercise of the powers conferred under Sections 61(a), (h) and (i), 62 (1) (a), and 86 (1) (a), (b), and (e) of the Electricity Act, 2003, and all other powers enabling it in this behalf, the Madhya Pradesh Electricity Regulatory Commission (MPERC or 'the Commission') determines the tariff for procurement of power by Distribution Licensees from Biomass based power projects to be commissioned during control period of this order.

The Commission has considered various provisions of the following legislative /Policy documents, while determining tariff for biomass power projects:

#### 1.1 Legislative and Policy Provisions

##### Electricity Act, 2003

The following provisions of the Electricity Act 2003 provide enabling legal framework for promotion of Renewable Sources of energy by the State Electricity Regulatory Commissions (SERCs):

**Section 61 (h)** of the Electricity Act provides that, while specifying terms and conditions of determination of tariff, the Commission shall be guided by the objective of promotion of cogeneration and generation of electricity from renewable sources of energy.

**Section 62 (1) (a)** of the Act provides determination of tariff for supply of electricity by a generating company to a distribution licensee.

**Section 86 (1) (b)** of the Act regulates the procurement process of electricity by distribution licensees as under: "regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State;"

**Section 86 (1) (e)** of the Act mandates promotion of co-generation and generation of electricity from renewable sources of energy: "Promote co-generation and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of total consumption of electricity in area of a distribution licensee."

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**Tariff Policy (TP), 2016**

In compliance with Section (3) of the Electricity Act 2003, the Central Government has notified revised tariff policy on 28<sup>th</sup> January 2016. The tariff policy elaborates role of regulatory commissions, the mechanism for promoting renewable energy, timeframe for implementation, etc. Clause 6.4 of the tariff policy addresses various aspects associated with promoting and harnessing renewable sources of energy generation including Waste to Energy power projects. Provisions stated under Clause 6.4 of Tariff Policy are given below.

*“(1) Pursuant to provisions of section 86(1)(e) of the Act, the Appropriate Commission shall fix a minimum percentage of the total consumption of electricity in the area of a distribution licensee for purchase of energy from renewable energy sources, taking into account availability of such resources and its impact on retail tariffs. Cost of purchase of renewable energy shall be taken into account while determining tariff by SERCs. Long term growth trajectory of Renewable Purchase Obligations (RPOs) will be prescribed by the Ministry of Power in consultation with MNRE.*

*(i) -----.*

*(ii) Distribution Licensee(s) shall compulsorily procure 100% power produced from all the Waste-to-Energy plants in the State, in the ratio of their procurement of power from all sources including their own, at the tariff determined by the Appropriate Commission under Section 62 of the Act.*

*(iii) -----.*

*(iv) Appropriate Commission may also provide for a suitable regulatory framework for encouraging such other emerging renewable energy technologies by prescribing separate technology-based REC multiplier (i.e., granting higher or lower number of RECs to such emerging technologies for the same level of generation). Similarly, considering the change in prices of renewable energy technologies with passage of time, the Appropriate Commission may prescribe vintage based REC multiplier (i.e., granting higher or lower number of RECs for the same level of generation based on year of commissioning of plant).*

*(2) States shall endeavour to procure power from renewable energy sources through competitive bidding to keep the tariff low, except from the waste to energy plants. Procurement of power by Distribution Licensee from renewable energy sources from projects above the notified capacity, shall be done through competitive bidding process, from the date to be notified by the Central Government.*

*However, till such notification, any such procurement of power from renewable energy sources projects, may be done under Section 62 of the Electricity Act, 2003. While determining the tariff from such sources, the Appropriate Commission shall take into account the solar radiation and wind*

*intensity which may differ from area to area to ensure that the benefits are passed on to the consumers.*

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## **1.2 MPERC RE Tariff Regulations, 2017**

MPERC (Terms and Conditions of determination of tariff for sale of energy from RE sources) Regulations, 2017 has been notified on 07<sup>th</sup> July 2017 which is applicable till new Regulations is notified for all RE technologies.

## **2 Procedural History**

The Commission issued an Approach Paper elaborating principles, methodology and various financial and operating parameters for determination of tariff for procurement of power from Biomass based power projects by distribution licensees in the state. The Commission invited, comments/suggestions/objections in this matter from the stakeholders/ interested persons on Approach Paper through Public Notice published in Patrika- Bhopal (Hindi), The Times of India- Indore (English) and Pradesh Today- Jabalpur (Hindi) on 01.06.2022, in addition to uploading the same on the Commission's website.

The Commission has received written comments / suggestions/ objections from two stakeholders on the Approach paper. Public Hearing in this matter was held on 12.07.2022 to hear the comments/suggestions/ Objections of Stakeholders on Approach Paper. One of the stakeholders who offered comments/suggestions/objections also participated in public hearing and stated his suggestions /comments/objections, offered by him in writing before the Commission.

## **3 Tariff framework for procurement of power from Biomass based power projects**

### **3.1 Tariff Structure and Design**

#### **Proposed in Approach Paper**

MPERC RE Tariff Regulations, 2017 provides that generic tariff shall normally be determined on levelled basis. Levellisation shall be carried out for 'useful life' of renewable energy project. Further, MPERC RE Tariff Regulations, 2017 provides for single part tariff with two components for determination of generic tariff for Biomass based power projects.

Considering above regulatory provisions, the Commission in Approach Paper proposed to determine tariff on Cost- plus basis consisting of fixed cost and variable cost components. Fixed cost component is to be determined on following basis:

- a. Capital cost;
- b. Debt: Equity Ratio
- c. Return on equity;
- d. Interest on loan capital;
- e. Depreciation;
- f. Interest on working capital;
- g. O&M expenses

Variable component is to be determined on following basis: -

- a. Cost of feedstock/fuel
- b. Auxiliary Consumption
- c. Gross Station Heat Rate
- d. Gross Calorific value
- e. Plant Load Factor

### **Comments/Suggestions**

One of the stakeholders submitted that Tariff for procuring power from biomass generation sources should be determined through competitive bidding process only. He further submitted that Hon'ble Commission may decide a ceiling tariff for competitive bidding process for procurement of power from Biomass based Generators.

### **Commission's View**

MPPERC RE Tariff Regulations 2017, specifies that for Renewable Energy technologies having fuel cost component like Biomass projects, variable cost component shall be determined based on fuel cost. The Commission have also noted that the competitive bidding guidelines for procurement of power from biomass based power projects are not issued by the Ministry of Power, GoI till date. In past tariff orders, the Commission has determined the year-wise tariff with fixed cost and variable cost components.

In view of the above, Commission decides to determine year-wise tariff with two components i.e. fixed cost and variable cost components for each year. The Biomass based projects commissioned during control period of this order shall be allowed to recover the fixed cost and variable cost on the basis of actual energy generation as per year-wise fixed and variable cost determined by the Commission in this order.

Further, electricity generation over and above normative Plant Load Factor specified in this order shall be dealt according to 'Treatment for Over-generation' provided under Regulation 11 of CERC's RE Tariff Regulations, 2020, which provides as under:

*“In case a renewable energy project, in a given year, generates energy in excess of the capacity utilization factor or plant load factor, as the case may be, specified under these Regulations, the renewable energy project may sell such excess energy to any entity, provided that the first right of refusal for such excess energy shall vest with the concerned beneficiary. In case, the concerned beneficiary purchases the excess energy, the tariff for such excess energy shall be 75 percent of the tariff applicable for that year”.*

### **3.2 Useful Life of Plant**

#### **Proposed in Approach Paper**

The Commission in Approach Paper proposed 25 years as useful life for Biomass based power projects for tariff determination purpose.

#### **Comments/ Suggestions**

The Commission has not received any suggestions/comments from the stakeholders in this regard.

#### **Commission’s View**

CERC in its RE Tariff Regulations, 2020 provides the project life for Biomass based power projects as 25 years. Other SERCs also in their recent tariff order considered useful life for biomass-based projects as 25 years.

In view of aforesaid, the Commission decides to consider 25 years as useful life for Biomass based power projects for tariff determination in this order.

### **3.3 Control Period**

#### **Proposed in Approach Paper**

The Commission in the Approach Paper has proposed that control period of tariff order for Biomass based power project shall commence from date of issuance of new tariff order and shall be valid up to 31 March 2024 (i.e., end of FY 2023-24).

#### **Comments/ Suggestions**

The Commission has not received any suggestions/comments from the stakeholders in this regard.

#### **Commission’s View**

The Commission decides that Control period of this tariff order shall commence from date of issue of order till 31st March 2024 unless reviewed earlier or extended.

### **3.4 Tariff Period**

#### **Proposed in Approach Paper**

The Commission in the Approach Paper has proposed tariff period as 25 years which is equivalent to useful life of the Biomass based power projects for tariff determination purpose.

#### **Comments/ Suggestions**

The Commission has not received any suggestions/comments from the stakeholders in this regard.

#### **Commission's View**

The Commission decides to consider Tariff period equal to useful life of plant i.e., 25 years in this order.

### **3.5 Eligibility Criteria**

#### **Proposed in Approach Paper**

In the Approach Paper, it was proposed that Biomass based power projects that uses new plant and machinery based on Rankine cycle technology using biomass fuel sources and to be commissioned during new control period from date of issue of this order to 31/03/2024, shall be eligible to sell power to distribution licensees at the tariff determined by the Commission under this tariff order for useful life of project.

#### **Comments/ Suggestions**

The Commission has not received any suggestions/comments from the stakeholders in this regard.

#### **Commission's View**

The Commission decides to retain eligibility criteria as proposed in the Approach Paper in this order.

### **3.6 Benchmark Capital Cost for Tariff Determination**

#### **Proposed in Approach Paper**

The Commission in Approach Paper proposed to fix the benchmark capital cost of Rs 5.92 Cr/MW for biomass-based power projects having water cooled condenser after escalating the Capital Cost of Rs 4.63 Cr/MW as considered in last tariff order dated 30<sup>th</sup>

November 2016 by weighted average growth rate of 5.07%. Benchmark capital cost of Rs 6.04 Cr/MW was proposed for biomass-based power projects using air cooled condenser for tariff determination in control period of this tariff order.

In order to arrive at benchmark capital cost for the Biomass based power projects to be commissioned in new control period, the Commission has gone through the Biomass based power project's capital cost considered by CERC and other SERCs in their recent RE Regulations/ tariff orders.

### **Comments/ Suggestions**

The Commission has not received any suggestions/comments from the stakeholders in this regard.

### **Commission's View**

The normative capital cost proposed in the Approach Paper was based on analysis of growth rate of the normative capital cost in previous control period as well as study of approach followed by CERC and other SERC in respective tariff orders / Regulations.

In view of aforesaid, the Commission decides to fix the benchmark capital cost of Rs. 5.92 Cr/MW for biomass-based power projects having water cooled condenser and Rs 6.04 Cr/MW for biomass-based power projects having air cooled condenser for tariff determination for the control period in this order. The capital cost is inclusive of the cost towards (i) plant and machinery, (ii) land cost (iii) evacuation infrastructure up to interconnection point, and (iv) associated service charges if any.

## **3.7 Debt Equity Ratio**

### **Proposed in Approach Paper**

The Commission has proposed the debt-equity ratio of 70:30 in the Approach Paper. The MPERC RE Tariff Regulations, 2017 provides normative debt-equity ratio is 70:30. The CERC and other SERCs are also considered debt-equity ratio as 70:30 for tariff determination purpose. The Tariff policy, 2016 also mentions the same debt equity ratio for the tariff determination purpose.

### **Comments/Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders in this regard.

### **Commission's View**

The Commission decides to consider the debt-equity ratio of 70:30 for tariff determination purpose, which is in line with the MPERC RE Tariff Regulations, 2017 as well as CERC RE Tariff Regulations, 2020 and provisions in Tariff Policy 2016.



### **3.8 Return on Equity**

#### **Proposed in Approach Paper**

MPERC RE Tariff regulations, 2017 provides for the Return on Equity as 20% on Pretax basis. The Commission while proposing RoE in the Approach Paper reviewed the current market practices and norms followed by CERC and other SERCs. The CERC RE Tariff Regulations, 2020 as well as States like Chattisgarh, Karnataka, Haryana, and Rajasthan, provide the normative Return on Equity as 14%. The normative Return on Equity is to be grossed up by the applicable notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the applicable notified Corporate Tax rate for the remaining Tariff Period.

Accordingly, the Commission has proposed a normative Return on Equity as 14%. The normative Return on Equity to be grossed up by the applicable notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the applicable notified Corporate Tax rate for the remaining Tariff Period.

#### **Comments/Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders in this regard.

#### **Commission's View**

CERC RE Tariff Regulations, 2020 specifies 14% RoE to be grossed up as per applicable tax rate for the Renewable Energy projects including Biomass based power projects. Other SERCs in recent past have also considered 14% RoE for RE tariff determination purpose. The Commission observed that post tax 14 % RoE grossing up by the applicable notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the applicable notified Corporate Tax rate for the remaining Tariff Period is reasonable to strike a balance between the generator and procurer. In view of the above, the Commission decides to consider a normative Return on Equity as 14%. The normative Return on Equity shall be grossed up by the applicable notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the applicable notified Corporate Tax rate for the remaining Tariff Period in this order.

### **3.9 Loan Repayment Period**

#### **Proposed in Approach Paper**

The Commission in the Approach Paper proposed to consider the loan repayment equal to 15 years for tariff determination in this control period.

The MPERC RE Tariff Regulations, 2017 provides for the loan repayment period of 10 years. However, it has been noted that the CERC in its RE Tariff Regulations, 2020 has recommended the loan repayment period as 15 years. Presently, the RE project proponents are getting loan with 15 years' repayment period. In view of aforesaid, the loan repayment equal to 15 years was proposed for tariff determination in this control period.

### **Comments/ Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders in this regard.

### **Commission's View**

In view of above, the Commission decides to consider the loan repayment period equal to 15 years for tariff determination purpose in this order which is consistent with CERC RE Tariff Regulations, 2020 and present market conditions.

## **3.10 Interest on Term Loan**

### **Proposed in Approach Paper**

MPERC RE Tariff Regulations, 2017 provides that the Commission would decide the interest on term loan in the tariff order. CERC RE Tariff Regulations, 2020 has provided the norms of normative interest rate as two hundred (200) basis points above the average State Bank of India Marginal Cost of Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months. Accordingly, in the approach paper interest on term loan for tariff determination was normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months i.e., SBI MCLR rate of 7.0% (average of last six months) plus 200 basis points i.e. 9.0% (7.0% + 2.0%).

### **Comments/Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders in this regard.

### **Commission's View**

The normative Interest rate on term loan has been proposed by Commission based on the norms of normative interest rate of two hundred (200) basis point above the average State Bank of India Marginal Cost of Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months as recommended in CERC RE Tariff Regulations, 2020. Same norms are being followed by most of the SERCs for fixing the normative interest on term loan. Actual interest rate offered by IREDA and PFC for lending to RE project have also been examined and found to be in same range.

In view of above, the Commission preferred to follow CERC norms based on SBI MCLR rate (one-year tenor) prevalent during the last available six months. The Commission decides to consider a normative interest on loan equal to 9% considering SBI MCLR rate of 7.0% (average of last six months) plus 200 basis points for tariff determination purpose for the control period of this order.

### **3.11 Rate of Depreciation**

#### **Proposed in Approach Paper**

MPCR RE Tariff Regulations, 2017 provides that the capital cost of the asset admitted by the Commission would be the base value for the purpose of determination of depreciation. Further, the salvage value of the asset is considered as 10%, and depreciation is allowed up to a maximum of 90% of the capital cost of the asset. The Commission in the Approach Paper proposed depreciation rate of 4.67% per annum for the first 15 years and the remaining depreciation is spread over the remaining useful life of the plant. This is in line with the method followed by CERC and other SERCs wherein the depreciation is linked with the loan repayment period.

#### **Comments/ Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders in this regard.

#### **Commission's View**

In view of above, the Commission decides to retain the depreciation rate of 4.67% per annum for the first 15 years and then the remaining depreciation (20%) to be spread over the remaining useful life of 10 years as proposed in the Approach paper, for a maximum of 90 % of the Capital Cost of the assets.

### **3.12 Working Capital**

#### **Proposed in Approach Paper**

The MPCR RE Tariff Regulations, 2017 provides the following components of working capital for Biomass based power projects:

- i) O&M expenses for 1 month
- ii) Receivables equivalent to 2 months of energy charges
- iii) Maintenance spares @ 15% of O&M expenses.
- iv) Fuel cost for four months equivalent to normative PLF.

CERC and other SERCs like CSERC, RERC and HERC have also followed similar approach while deciding working capital requirements for Biomass based power projects. In view

of the above, it was proposed to consider working capital components as per MPERC RE Tariff Regulations, 2017.

### **Comments/ Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders in this regard.

### **Commission's View**

The Commission decides to consider the following components of working capital for tariff determination purpose as proposed in approach paper in accordance to the RE Tariff Regulations, 2017:

- i) O&M expenses for 1 month
- ii) Receivables equivalent to 2 months of energy charges
- iii) Maintenance spares @ 15% of O&M expenses.
- iv) Fuel cost for four months equivalent to normative PLF.

## **3.13 Interest on Working Capital**

### **Proposed in the Approach Paper**

CERC RE Tariff Regulations, 2020 has provided the norms for interest on working capital as three hundred and fifty (350) basis points above the average State Bank of India Marginal Cost of Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months. Accordingly, in the Approach Paper interest on working capital for tariff determination was proposed as SBI MCLR rate of 7.0% (average of last six months) plus 350 basis points i.e., 10.5% (7.0% + 3.5%).

### **Comments / Suggestions**

The Commission has not received any comments/ suggestions from the stakeholders in this regard.

### **Commission's View**

The Commission decides to consider the interest on working capital for tariff determination as 10.5% i.e., 350 basis points above SBI MCLR rate of 7.0% (average of last six months), similar to CERC RE tariff Regulations, 2020 in this order.

## **3.14 Operations and Maintenance Cost**

### **Proposed in Approach Paper**

The MPERC RE Tariff Regulations, 2017 defines Operations and Maintenance (O&M) expenses as the expenditure incurred on operation and maintenance of the project, or

part thereof, and includes the expenditure on manpower, repairs, spares, consumables, insurances, and overheads.

The Commission in the approach paper has proposed to fix O&M cost for Biomass based Power projects as 6% of the capital cost during first year of operation with an annual escalation factor of 3.84% over the useful life of the plant in line with CERC approach.

### **Comments/ Suggestions**

The Commission has not received any suggestions/comments from the stakeholders in this regard.

### **Commission's View**

The Commission in its earlier order dated 30<sup>th</sup> November 2016 had considered O&M expenses at the rate of 4% of the Capital Cost with annual escalation of 5.72 %. It has been observed that in CERC RE Regulations, 2020, the annual escalation rate is revised to 3.84% with respect to change in WPI and CPI during last 5 years and O & M expenses were considered at the rate of 6 % of the capital Cost. The O&M expenses considered by the other SERCs ranges between 4% to 9% of the capital cost. In view of this, the Commission decides to fix normative O&M cost as 6% of the capital cost during first year of operation with an annual escalation at the rate of 3.84% over the useful life of the plant for the projects commissioned during the control period of this order.

### **3.15 Plant Load Factor**

#### **Proposed in Approach Paper**

The Commission in the Approach Paper has proposed to consider plant load factor as 80% for tariff determination purpose.

### **Comments/ Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders.

### **Commission's View**

For Biomass based power plants, MPERC RE Tariff Regulations, 2017 provides a normative Plant Load Factor equal to 65% during 1st year of operation and 80% from 2nd year onward for tariff determination purpose. CERC RE Tariff Regulations, 2020 provides for a normative Plant Load Factor of 80% for Biomass power plants. Other SERC's has also followed the CERC approach while specifying PLF for the Biomass based power projects. In view of above, the Commission decides to consider the normative Plant Load Factor of 80 % for the Biomass based power project for tariff determination purpose in this order.

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### **3.16 Auxiliary Consumption**

#### **Proposed in Approach Paper**

The Commission in the Approach Paper has proposed normative auxiliary consumption at 10 % of gross generation for tariff determination purpose, according to MPERC RE Tariff Regulations, 2017.

The Commission in its earlier tariff order dated 30<sup>th</sup> November 2016 had considered the same normative value for the auxiliary consumption.

#### **Comments/ Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders.

#### **Commission's View**

The Commission decides to fix the normative value of auxiliary consumption as 10% of the gross generation for tariff determination purpose for the control period of this order, which is also in line with the MPERC RE Tariff Regulations, 2017 and earlier tariff order dated 30<sup>th</sup> November 2016.

### **3.17 Cost of Fuel**

#### **Proposed in Approach Paper**

The Commission in the Approach paper has proposed that the feedstock suitable for Biomass based power plants may comprise of rice husk, Soyabean or any other crop/forest residue available in the state. The Commission had proposed the fuel cost for determination of tariff during control period of this order by escalating the cost of biomass fuel in previous tariff order dated (30th November 2016) by an escalation factor of 5 % per annum.

Accordingly, biomass fuel cost of Rs 3365 /MT was proposed for FY 2022-23. An escalation factor of 5 % was proposed for determination of fuel cost from 2nd year onwards for determination of levelized tariff for the biomass-based projects during the control period.

#### **Comments/Suggestions**

One of the stakeholders has submitted that the actual landed cost of biomass fuel at one of the operational biomass power projects in the state is about of Rs 3800/per MT. Some recent bills in support of its contention for biomass fuel cost were submitted by the stakeholder. The stakeholder submitted that the Biomass fuel price should be considered

as Rs 3800/ MT for FY 2022-23 and it shall be escalated at the rate of 5% per annum during subsequent years of the control period.

### **Commission's View**

The Commission has noted that the biomass plant for which data is referred by the above stakeholder was not in operation for past few years. In such situation, the data with regard to biomass fuel submitted by the stakeholder cannot be considered as representative data for determination of generic tariff in the State.

The Commission is of the view that biomass fuel cost in the state depends on availability of biomass (agro waste) for power generation, which is mostly dependent on production of underlying crop based on cropping pattern and climatic conditions during the year.

In view of above, the Commission decides to fix the biomass fuel cost of Rs 3365 / MT for FY 2022-23 as proposed in approach paper with an escalation rate of 5% per annum from 2<sup>nd</sup> year onward for determination of tariff for the biomass-based power projects to be commissioned in this control period. Escalation rate of 5% per annum is considered for the following reasons:

- i. MPERC RE Tariff Regulations 2017 specifies annual escalation rate of 5% p.a. for biomass fuel cost from 2<sup>nd</sup> year onwards.
- ii. CERC has also recommended same escalation rate of 5% p.a. for revision of biomass fuel cost from 2<sup>nd</sup> year onwards in its RE tariff Regulations since year 2012.
- iii. Most of the SERCs have considered this escalation rate of 5% p.a. for levelized tariff computation.
- iv. The stakeholder also suggested the same escalation rate for tariff determination purpose.

### **3.18 Gross Calorific Value (GCV)**

#### **Proposed in Approach Paper**

The Commission in the Approach paper has proposed GCV of Biomass as 3100 kCal/kg. The Commission in its earlier tariff order dated 30<sup>th</sup> November 2016 had considered the same value of GCV of bagasse for tariff determination purpose. The CERC and most of SERCs have considered GCV of Biomass as 3100 kCal/kg.

#### **Comments/Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders.

#### **Commission's View**

The Commission in its earlier tariff order considered Gross Calorific Value of Biomass as 3100 kCal/kg. The Commission has observed that the CERC and other SERCs in their recent tariff orders have considered the same value of GCV for tariff determination.

In view of above, the Commission decides to consider the Gross Calorific Value of Biomass as 3100 kCal/kg for tariff determination purpose for control period of this order.

### **3.19 Station Heat Rate**

#### **Proposed in Approach Paper**

The Commission in the approach paper has proposed Station Heat Rate as 4200 kCal/kWh for tariff determination purpose, which is same as considered by CERC in its Regulations 2020 and other SERCs.

The Commission in its earlier tariff order dated 30<sup>th</sup> November 2016 had considered the same normative values for the Station Heat Rate.

#### **Comments/Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders.

#### **Commission's View**

Station Heat Rate depends on the plant design and operating conditions; it has been noted that the CERC and most of the SERCs have considered the normative value of Station Heat Rate as 4200 kcal/kWh.

In view of above, the Commission decides to fix the normative value of Station Heat Rate as 4200 kcal /kWh for tariff determination purpose for the control period of this order.

### **3.20 Specific Fuel Consumption**

#### **Proposed in Approach Paper**

The Commission in the approach paper has proposed that Specific Fuel consumption as 1.35 kg/kWh.

#### **Comments/Suggestions**

The Commission has not received any Comments/ suggestions from the stakeholders.

#### **Commission's View**

Specific fuel consumption is the resultant of Station Heat Rate and Gross Calorific Value of the fuel. With the above considered, Station Heat Rate at 4200 kCal/kWh and GCV at



3100 kCal/kg, the resultant specific fuel consumption works out to 1.35 kg/kWh. The Commission decides to consider specific fuel consumption of 1.35 kg/kWh for tariff determination purpose in this control period.

#### **4 Treatment for Subsidy or Incentive received from Central / State Government**

##### **Proposed in Approach Paper**

The MPERC RE Tariff Regulations, 2017 provides that the Commission shall indicate in the tariff order whether any subsidy or incentive offered by the Central or State Government is taken into consideration or not.

It has been noted that presently, no Financial Assistance in the form of back-ended subsidy is provided by the Central or State Government for installation of biomass-based energy projects. The Commission has not factored-in such subsidy / grant while determining the tariff for this control period. In case, the biomass project developer receives subsidy / grant from government in future during the control period of this order, the State Nodal Agency/ Project proponent/ generator shall inform the same to the MPPMCL / distribution Licensee on quarterly basis.

It was proposed that such subsidy / grant / incentive received by project proponent shall be adjusted in subsequent bills payable by the MPPMCL / distribution utility in suitable instalments or within such period as may be specified by the Commission.

To factor in the benefit of Accelerated Depreciation available from central government, the Commission proposed to specify separate tariff by taking into account the accelerated depreciation (AD) benefit as well as without considering the AD benefit.

Following principles was proposed to determine the per-unit AD benefit:

As per the current provisions under Income Tax Act, RE project owners can avail accelerated depreciation at the rate of 40% in the first year on a **written-down value (WDV)** basis. In addition to this 40% depreciation, an additional depreciation of 20% in the initial year is extended to new assets acquired by power generation companies vide amendment in the section 32, sub-section (1) clause (iia) of the Income Tax Act, 1961. With this, the projects can avail 60% depreciation in the first year of commissioning. From the second year onwards, depreciation at the rate of 40% on written-down-value (WDV) is available. The Commission has considered the above depreciation rate while calculating per unit AD benefit in this order.

Following principles have been considered for ascertaining Income Tax benefit on account of accelerated or additional depreciation for the purpose of tariff determination:

- a. The assessment of benefit shall be based on normative Capital Cost, book depreciation rate of 5.28% per annum, accelerated/ additional depreciation rate (i.e., 60% in the first year and 40% from Second year onwards) as per the relevant provisions of the Income Tax Act and the Corporate Income Tax rate.
- b. The Capitalisation of RE Projects for the full financial year;
- c. The Per-unit benefit shall be derived on levelled basis at a discounting factor equivalent to the post-tax weighted average cost of capital.

### **Comments/Suggestions**

The Commission has not received any comments/ suggestions from the stakeholders in this regard.

### **Commission's View**

The Commission decides to determine tariff without considering the subsidy /incentive. In case the project proponent / generator receives subsidy or incentive from Central/State government, which is not considered in tariff determination, same shall be adjusted in subsequent bills payable by the MPPMCL / distribution utility in equated monthly installment of Rs 5 lakh/per MW / per month till the subsidy received by generator is fully recovered.

The State Nodal Agency/ Project proponent/ generator shall inform the MPPMCL / distribution Licensee regarding any such grant, subsidy or incentives received by a Project proponent / generator on a quarterly basis. The MPPMCL shall confirm the receipt of such subsidy / incentive to Biomass based project proponent from the State Nodal Agency and accordingly execute the Power Purchase Agreement as per applicable Tariff specified in this order.

To factor-in the benefit of Accelerated depreciation available from central government, the Commission decides to specify separate tariff by taking into account the accelerated depreciation (AD) benefit as well as without considering the AD benefit.

Following principles shall be adopted to determine the per-unit AD benefit:

As per the current provisions under Income Tax Act, RE project owners can avail accelerated depreciation at the rate of 40% in the first year on a written-down value (WDV) basis. In addition to this 40% depreciation, an additional depreciation of 20% in the initial year is extended to new assets acquired by power generation companies vide amendment in the section 32, sub-section (1) clause (ia) of the Income Tax Act, 1961.

With this, the projects can avail 60% depreciation in the first year of commissioning. From the second year onwards, depreciation at the rate of 40% on WDV is available.

Following principles shall be adopted for ascertaining the Income Tax benefit on account of accelerated or additional depreciation for the purpose of tariff determination:

- a. The assessment of benefit shall be based on normative Capital Cost, book depreciation rate of 5.28% per annum, accelerated/ additional depreciation rate (i.e., 60% in the first year and 40% from Second year onwards) as per the relevant provisions of the Income Tax Act and the Corporate Income Tax rate.
- b. The Capitalisation of RE Projects for the full financial year;
- c. The Per-unit benefit shall be derived for each year and considered appropriately in tariff.

It is further clarified that in case the generating company is not claiming accelerated depreciation benefit, the Power Purchase Agreement entered into with the generating company shall include an undertaking by the generating company with certificate from the Chartered Accountant indicating that accelerated benefit would not be availed for the project.

Provided also that if accelerated or higher depreciation benefit has been claimed despite submission of the undertaking, then the MPPMCL / distribution licensee shall be entitled to recover amount wrongly claimed along with penal charges at the rate of 1.50% per month calculated on daily basis.

## 5 Computation of Tariff for Biomass based Power Projects

The operating and financial parameters considered by the Commission for tariff determination for the control period in this order are as given below:

Parameters for tariff determination of Biomass based Power projects

Parameters	Biomass Based Power Projects
	Project Cost and O&M
Total Project Cost:- Water Cooled (Rs. Lakh/MW) Without Subsidy	592
Total Project Cost:- Air Cooled (Rs. Lakh/MW) Without Subsidy	604
Normative O&M Cost for First Year (Rs. Lakh/MW)	6% of the Project Cost
Escalation in O&M (per annum from 2nd year)	3.84%
Performance Parameters	
PLF (%)	80%
Auxiliary Consumption (%)	10%

Determination of Tariff for Biomass based Power Projects

Parameters	Biomass Based Power Projects
Project Life in Years	25
Gross caloric value (kCal/kg)	3100 kCal/kg
Station Heat Rate (kCal/kWh)	4200 kCal/ kWh
Specific fuel consumption (Kg/kWh)	1.35 (Kg/kWh)
Financial Parameters	
Debt-Equity Ratio	70:30
Term of Loan in Years	15
Interest on Term Loan (%)	9 %
Interest on Working Capital Loan (%)	10.5 %
Depreciation (%)	4.67% (up to 15 years) 2% (16 to 25 years)
Base rate of Return on Equity * (%)	14 %
Biomass price (Rs/ MT)	Rs 3365/ MT
Fuel cost escalation (%)	5% per annum

\*Base rate grossed up by the applicable Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the applicable Corporate Tax rate for the remaining 5 years of Tariff Period.

Approved Tariffs are given below:

**Tariff for Biomass based power projects with water cooled condenser**

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fixed Charges (Rs/kWh)	2.37	2.37	2.36	2.36	2.36	2.37	2.37	2.38	2.39	2.40	2.41	2.42	2.44	2.46	2.48	2.27	2.34	2.41	2.48	2.56
Less: AD benefit (Rs / kWh)*	1.79	0.35	0.14	0.02	-0.06	-0.11	-0.13	-0.15	-0.16	-0.16	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.17	-0.01	0.00	0.00
Variable Charges (Rs/ kwh)	5.07	5.32	5.58	5.86	6.16	6.47	6.79	7.13	7.48	7.86	8.25	8.66	9.10	9.55	10.03	10.53	11.06	11.61	12.19	12.80

Year	21	22	23	24	25
Fixed Charges (Rs/kWh)	2.77	2.86	2.94	3.03	3.13
Less: AD benefit (Rs / kWh)*	0.00	0.00	0.00	0.00	0.00
Variable Charges (Rs/ kwh)	13.44	14.11	14.82	15.56	16.34

**Tariff for Biomass based power projects with air cooled condenser**

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fixed Charges (Rs/kWh)	2.41	2.41	2.41	2.40	2.40	2.41	2.41	2.42	2.43	2.44	2.45	2.46	2.48	2.50	2.52	2.31	2.38	2.45	2.52	2.60
Less: AD benefit (Rs / kWh)*	1.83	0.36	0.14	0.02	-0.06	-0.11	-0.13	-0.15	-0.16	-0.17	-0.17	-0.17	-0.17	-0.18	-0.18	-0.18	-0.18	-0.01	0.00	0.00
Variable Charges (Rs/ kwh)	5.07	5.32	5.58	5.86	6.16	6.47	6.79	7.13	7.48	7.86	8.25	8.66	9.10	9.55	10.03	10.53	11.06	11.61	12.19	12.80

Year	21	22	23	24	25
Fixed Charges (Rs/kWh)	2.81	2.90	2.99	3.08	3.18
Less: AD benefit (Rs / kWh)*	0.00	0.00	0.00	0.00	0.00
Variable Charges (Rs/ kwh)	13.44	14.11	14.82	15.56	16.34

\* Positive means to be deducted, and negative means to be added to tariff

## 6 Other Issues

### Proposed in Approach Paper

In the Approach Paper, the Commission has proposed arrangement for power purchase agreement between the Biomass based power project owner and MPPMCL, reactive energy charges applicable to Biomass based power project as per provisions under relevant regulations / code notified by MPERC/CEA / CERC depending on the case. The Commission in the Approach paper also proposed the mechanism of sharing of CDM benefits as per the provisions under the MPERC RE Regulations, 2017.

### Comments/ Suggestions

The Commission has not received any comments/ suggestions from the stakeholders in this regard.

### Commission's View

The Commission decides to deal with the power purchase arrangement, Reactive energy charges and sharing of CDM benefit sharing issues as provided below:

#### 6.1 Power Purchase Agreement

The energy generated from Biomass based power projects will be procured centrally by the M.P. Power Management Co. Ltd. (MPPMCL) at the applicable tariff determined by the Commission in this order. The Power Purchase Agreement shall be signed between developer and MPPMCL. The agreement will be for sale of electricity for a period of 25 years from the date of commissioning of the plant. The energy so procured will be allocated by MPPMCL to three distribution licensees on the basis of actual energy input in the previous financial year. MPPMCL will have a back-to-back power supply agreement with the Distribution Licensees. The developer may execute the agreement with MPPMCL before commissioning of the plant. The developer shall file Commissioning Certificate with all relevant documents to the Procurer separately.

The Biomass based power developers are required to get all the required statutory clearances/approvals/consents from the government before entering into agreement with M.P. Power Management Company Limited.

#### 6.2 Reactive Power Supply

The Biomass based power projects are deemed to be generating stations of a generating company and all functions, obligations, and duties assigned to such stations under the Electricity Act 2003 would be applicable to these power stations. These stations would be required to abide by all applicable codes notified by MPERC / CERC /CEA as the case may be.

The Commission determines the charges for KVARh consumption from grid from time to time and the same would be applicable to Biomass based power projects. Present applicable reactive energy charges are 27 paise per unit which would be payable by the developer till the revision in the rates, to the Distribution Licensees in whose territorial area the Biomass based power project is located.

### **6.3 Sharing of Clean Development Mechanism (CDM) Benefits**

Regulations 18 of MPERC RE Tariff Regulations, 2017 provides mechanism for sharing of CDM benefit by the generator with the power procurer.

#### **18. Sharing of CDM Benefits:**

- (1) The proceeds of carbon credit from approved CDM project shall be shared between generating company and concerned beneficiaries in the following manner, namely-*
- (a) 100% of the gross proceeds on account of CDM benefit to be retained by the project developer in the first year after the date of commercial operation of the generating station;*
  - (b) In the second year, the share of the beneficiaries shall be 10% which shall be progressively increased by 10% every year till it reaches 50%, where after the proceeds shall be shared in equal proportion, by the power generating company and the beneficiaries."*

The Commission decides to retain the above provisions for sharing of CDM benefits for this control period. However, Biomass based power projects availing CDM benefit shall share the CDM proceeds annually as per above, by 31<sup>st</sup> March of every year with an affidavit stating the annual energy generation (date of commissioning as starting point of the first year), carbon credits generated, and receipts in this regard.

## **7 Any Other Provisions**

### **Proposed in Approach Paper**

The Commission in the Approach Paper proposed that all other provisions which are not mentioned in the approach paper explicitly for Biomass based power projects like Renewable purchase obligation (RPO), scheduling, Wheeling charges for Third-Party sale/captive consumption, Metering & Billing, payment mechanism, Default Provisions for Third-Party Sale or sale to utility, etc. shall be guided by the relevant provisions of Madhya Pradesh Electricity Regulatory Commission (Co-generation and Generation from Renewable sources of Energy), Regulations as applicable.

### **Comments/Suggestions**

One of the stakeholders requested to specify separate Renewable purchase obligation (RPO) of 2% for biomass-based power projects within the notified non-solar Renewable purchase obligation (RPO) in line with practice followed by RERC.

### **Commission's View**

Fixing Renewable Purchase Obligation is not subject matter of the present proceedings. The Commission shall deal with the same appropriately in future.

## **8 Applicability of the Order**

The tariff determined in this order shall be applicable to all Biomass based power project commissioned during the control period of this order for sale of electricity to the distribution licensees in the state. The control period of this tariff order shall commence from the date of issue of this order till 31<sup>st</sup> March 2024 unless reviewed earlier or extended.

The tariff determined by the Commission under this order shall be the ceiling tariff, the distribution licensee may procure electricity from the Biomass based power project proponent / generator at a tariff lower than the tariff determined by the Commission. The Biomass based Power projects commissioned during the control period of previous Tariff order shall be governed by the terms and conditions given in the said tariff order.

**(Gopal Srivastava)**

**Member (Law)**

**(Mukul Dhariwal)**

**Member**

**(S.P.S Parihar)**

**Chairman**

**Place: Bhopal**

**Date: 13<sup>th</sup> September' 2022**

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