SMP – 27/2021

Madhya Pradesh Electricity Regulatory Commission

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

PRESENT:

S.P.S Parihar, Chairman

Mukul Dhariwal, Member

Shashi Bhushan Pathak, Member

IN THE MATTER OF:

DETERMINATION OF TARIFF FOR PROCUREMENT OF POWER BY DISTRIBUTION LICENSEES FROM BAGASSE BASED CO-GENERATION PROJECTS IN THE STATE OF MADHYA PRADESH

August 2021

ORDER

(Passed on this day of 19.08.2021)

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 Bagasse based Co-generation projects to be commissioned during control period of this order.

The Commission has issued the previous generic tariff order for procurement of power from Bagasse based Co-generation plants in Madhya Pradesh on 01 April 2013 (in SMP 13/2013). The control period of the said order was up to 31 March 2016 which was subsequently extended by the Commission till issuance of further order in the subject matter.

The Commission had duly considered various provisions of the following legislative /Policy documents, while determining tariff in this order.

1.1 Legislative and Policy Provisions

Electricity Act, 2003

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

Section 61 (h) of the Act provides that, while specifying the 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 for 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 the distribution licensees as under: "regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State;"

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 the grid and sale of electricity to any person, and also specify, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee."

National Electricity Policy (NEP)

Clause 5.12 of the NEP stipulates several conditions for promotion and harnessing of renewable energy sources. The salient features of the said provisions of NEP are reproduced below.

*"**5.12.1**: Non-conventional sources of energy being the most environment friendly, there is an urgent need to promote generation of electricity based on such sources of energy. For this purpose, efforts need to be made to reduce the capital cost of projects based on non-conventional and renewable sources of energy. Cost of energy can also be reduced by promoting competition within such projects. At the same time, adequate promotional measures would also have to be taken for development of technologies and a sustained growth of these sources.*

***5.12.2**: The Electricity Act, 2003 provides that co-generation and generation of electricity from non-conventional sources would be promoted by the SERCs by providing suitable measures for connectivity with the grid and sale of electricity to any person and also by specifying, for purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution licensee. Such percentage for purchase of power from non-conventional sources should be made applicable for the tariffs to be determined by the SERCs at the earliest. Progressively, the share of electricity from non-conventional sources would need to be increased as prescribed by State Electricity Regulatory Commissions. Such purchase by distribution companies shall be through competitive bidding process. Considering the fact that it will take some time before non-conventional technologies compete, in terms of cost, with conventional sources, the Commission may determine an appropriate differential in prices to promote these technologies."*

Tariff Policy (TP), 2016

In compliance with Section (3) of the Act, the Central Government has notified the revised tariff policy on 28 January 2016. The tariff policy elaborates the role of regulatory commissions, the mechanism for promoting renewable energy, the 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 Co-generation from renewable energy sources. The provisions stated under Clause 6.4 of TP 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.

Provided that, cogeneration from sources other than renewable sources shall not be excluded from the applicability of RPOs.

(i) Within the percentage so made applicable, to start with, the SERCs shall also reserve a minimum percentage for purchase of solar energy from the date of notification of this policy which shall be such that it reaches 8% of total consumption of energy, excluding Hydro Power, by March 2022 or as notified by the Central Government from time to time.

(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) It is desirable that purchase of energy from renewable sources of energy takes place more or less in the same proportion in different States. To achieve this objective in the current scenario of large availability of such resources only in certain parts of the country, an appropriate mechanism such as Renewable Energy Certificate (REC) would need to be promoted. Through such a mechanism, the renewable energy-based generation companies can sell the electricity to local distribution licensee at the rates for conventional power and can recover the balance cost by selling certificates to other distribution companies and obligated entities enabling the latter to meet their renewable power purchase obligations. The REC mechanism should also have a solar specific REC.

(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.

(3) The Central Commission should lay down guidelines for pricing intermittent power, especially from renewable energy sources, where such procurement is not through competitive bidding. The tariff stipulated by CERC shall act as a ceiling for that category…………………………………………………..

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………. (6) In order to further encourage renewable sources of energy, no inter-State transmission charges and losses may be levied till such period as may be notified by the Central Government on transmission of the electricity generated from solar and wind sources of energy through the inter-state transmission system for sale.

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 07th July 2017. The control period of the said Regulations is up to 31st March 2022, unless reviewed earlier or extended. The general tariff related provisions provided in the Regulations, applicable for all RE technologies are summarised below:

- Applicability – apply in all cases where the tariff is to be determined by the Commission under Section 62 read with Section 86 of the Act.
- Tariff determined for the projects commissioned during the control period, shall continue to be applicable for the entire duration of the 'useful life' as specified in these regulations.
- Tariff structure would be fixed and /or variable cost, as applicable.
- Generic tariff will be determined on levellised basis on useful life, and discount factor is the post-tax weighted average cost of capital.
- The Commission shall indicate in the order whether the subsidy is considered or not.

- The preferential tariff as determined by the Commission for RE technologies/sources other than Solar shall also be subject to bidding after the date of issue of notification by the Central Government in terms of Tariff Policy, 2016.

The MPERC RE Regulations do not explicitly provide technology-specific parameters for determination of tariff for procurement of power from Bagasse based Co-generation projects.

2 Procedural History

The Commission issued an Approach Paper elaborating the principles, methodology and various financial and operating parameters for determination of tariff for procurement of power from Bagasse based Co-generation plants by the distribution licensees in the state. The Commission invited, comments/suggestions/views from the Stakeholders/Interested persons on the Approach Paper through Public Notice published in the subject matter in the Dainik Bhaskar – Indore (Hindi), Raj Express - Jabalpur (English) and Nav Dunia – Bhopal (Hindi) on 09.06.2021, in addition to uploading the same on the Commission's website.

Public Hearing in this matter was held on 06.07.2021 to hear the comments/suggestions of Stakeholders on the Approach Paper. The Commission has not received any written comments / suggestion on the Approach paper. No one appeared on behalf of the stakeholders in the public hearing.

3 Tariff framework for procurement of power from Bagasse based Co-generation 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 levellised basis. Levellisation shall be carried out for the 'useful life' of the renewable energy project.

CERC RE Tariff Regulations 2020 provides that for renewable energy projects having single part tariff with two components, fixed cost component shall be determined on levellised basis considering the year of commissioning of the project while fuel cost component shall be determined on year of operation basis. For the purpose of levelized tariff computation, discount factor equivalent to post-tax weighted average cost of capital shall be considered.

The CERC RE Regulations 2020 provides treatment for over-generation from RE project. In case a renewable energy project, in a given year, generates energy in excess of the capacity utilization factor/ plant load factor, in such case 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.

Considering above regulatory provisions, the Commission in the Approach paper proposed to determine single part levellised 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

Fuel cost for the Bagasse based Co-generation project is to be determined as variable cost component based on following parameters

a. Gross Calorific Value (GCV)
b. Station Heat Rate
c. Fuel Price
d. Plant Load Factor
e. Auxiliary Consumption

Comments/Suggestions

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

Commission's View

The Commission decides to determine single part levellised tariff on Cost-plus basis consisting of fixed cost and variable cost components over the useful life of the plant. The Bagasse based Co-generation project owner / generator shall be allowed to recover the fixed cost and variable cost on the basis of actual energy generation as per the levellised fixed and variable tariff specified by the Commission. The electricity generation over and above the normative Plant Load Factor specified in this order shall be dealt according to the 'Treatment for Over-generation' provided under CERC's RE Regulations 2020.

3.2 Useful Life of Plant

Proposed in Approach Paper

The Commission in the Approach paper proposed 25 years as useful life for the Bagasse based Co-generation projects for tariff determination purpose.

Comments/ Suggestions

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

Commission's View

CERC in its RE Tariff Regulation 2020 has considered the project life for Bagasse based Co-generation projects as 25 years. Other SERCs (Maharashtra, Karnataka) have also considered the useful life of Bagasse based Cogeneration projects as 25 years.

In view of above, the Commission decides to consider 25 years as useful life for the Bagasse based Co-generation projects for tariff determination.

3.3 Control Period

Proposed in Approach Paper

The Commission in the Approach paper has proposed that the control period of the tariff order under discussion shall commence from the date of issuance of the 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 suggestion/comments from the stakeholders in this regard.

Commission's View

The Commission decides that the Control period of this tariff order shall commence from the date of issue of order till 31st March 2024 (i.e., end of FY 2023-24) 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 plant for the Bagasse based Co-generation projects for tariff determination purpose.

Comments/ Suggestions

The Commission has not received any suggestion/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.

3.5 Eligibility Criteria

Proposed in Approach Paper

In the approach paper, it was proposed that the Bagasse based Co-generation projects commissioned during new control period from the 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 the project.

Comments/ Suggestions

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

Commission's View

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

3.6 **Benchmark Capital Cost for Tariff Determination**

Proposed in Approach Paper

The Commission in the Approach paper proposed to fix benchmark capital cost of **Rs 4.66 Cr/MW** for Bagasse based Co-generation power projects for tariff determination in the control period of this tariff order.

The benchmark capital cost considered by the Commission in the previous tariff order dated 01 April 2013 (in SMP 13/2013 was Rs 4.36 Cr/MW.

In order to arrive at benchmark capital cost for the Bagasse based Co-generation projects to be commissioned in new control period, the Commission has gone through the Bagasse based Co-generation project capital cost considered by CERC and other SERCs in their recent RE regulations/ tariff orders. The Commission has also examined the technology trend especially the high-pressure efficient boilers together with condensing extraction steam turbines being used for the Bagasse based Co-generation power projects.

The Commission has also looked into the change in WPI of steel and E&M during the year 2013 to 2019, the extended control period of previous tariff order and corresponding growth rate based on the data published by the Office of Economic Advisor, Ministry of Commerce, and Industry, GOI. The capital cost reported by the three Bagasse based Co-generation projects set up in the state of Madhya Pradesh during FY 2017-18 had also been considered while arriving at the benchmark capital cost for the new control period.

Comments/ Suggestions

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

Commission's View

In view of above, the Commission decides to fix the benchmark capital cost of **Rs 4.66 Cr/MW** for Bagasse based Co-generation power projects for tariff determination for the control period of 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 considered 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 SERCs are also considered debt-equity ratio as 70:30 for tariff determination purpose. The Tariff policy, 2016 also mentions the same ratio.

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.

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 provides the 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. It is further observed that in States like Gujarat, Rajasthan, and Kerala, the rate of RoE in the case of RE projects is allowed at 14%.

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

In view of above, the Commission decides to consider 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.

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 for 15 years' repayment period. In view of aforesaid, the loan repayment equal to 15 years is 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.

3.10 Interest on Term Loan

Proposed in Approach Paper

MPERC RE Tariff Regulations 2017 provides 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 proposed as SBI MCLR rate of 7.0% (average of last six months) with a spread of 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

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 as elaborated below:

SBI MCLR (one-year tenure) for last six months

Effective rate	Interest rate
10 January 2021	7.0%
10 December 2020	7.0%
10 November 2020	7.0%
10 October 2020	7.0%
10 September 2020	7.0%
10 August 2020	7.0%

The Commission decides to consider a normative interest on loan equal to 9% as SBI MCLR rate of 7.0% (average of last six months) with a spread of 200 basis points for tariff determination purpose for the control period of this order.

3.11 Rate of Depreciation

Proposed in Approach Paper

MPERC 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 in 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.

3.12 Working Capital

Proposed in Approach Paper

The MPERC RE Tariff Regulations 2017 provides the following components of working capital for Bagasse based Cogeneration 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.

The Commission in the approach paper proposed to not consider the fuel cost component as part of working capital since bagasse is the by-product of sugar making process and the same is available in the premises of the sugar industry during the crushing / operational period. The Commission observed that few other SERCs are taken similar stand in recent tariff order which the Commission feels appropriate to balance the interest of the generator and power procurer.

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:

i) O&M expenses for 1 month
ii) Receivables equivalent to 2 months of energy charges
iii) Maintenance spares @ 15% of O&M expenses.

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 (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) with a spread of 300 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% ie SBI MCLR rate of 7.0% (average of last six months) with a spread of 350 basis points.

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 Bagasse based Co-generation projects as 3% of the capital cost during first year of operation with an annual escalation factor of 3.84% over the useful life of the plant.

The CERC in its RE Tariff Regulations 2020 provides for annual escalation factor of 3.84% for O&M cost escalation over useful life of plant. This has been derived by CERC based on changes in WPI and CPI during the last five years (FY 2014-15 to FY 2018-19).

Comments/ Suggestions

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

Commission's View

The Commission in its earlier order dated 1st April 2013 had considered O&M expenses at the rate of 3% of the Capital Cost with annual escalation of 5 %.. It has been observed that in CERC RE regulation 2020 the annual escalation rate is revised to 3.84% with respect to change in WPI and CPI during last 5 years. In view of this, the Commission decides to fix normative O&M cost as 3% 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 control period of this order.

3.15 **Gross Calorific Value (GCV)**

Proposed in Approach Paper

The Commission in the Approach paper has proposed GCV of Bagasse as 2250 kCal/kg. The Commission in its earlier tariff order dated 01 April 2013 (in SMP 13/2013) had considered the same values of GCV of bagasse for tariff determination purpose. The CERC and most of SERCs have considered GCV of Bagasse as 2250 kCal/kg.

Comments/Suggestions

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

Commission's View

The Commission recognise that Bagasse is a process waste of sugar factory with the moisture content of around 50%.

The CERC and most of SERCs have considered GCV of Bagasse as 2250 kCal/kg. In view of above, the Commission decides to consider the Gross Calorific Value of Bagasse as 2250 kCal/kg for tariff determination purpose for control period of this order.

3.16 Specific Fuel Consumption

Proposed in Approach Paper

The Commission in the Approach paper has proposed specific fuel consumption of 1.6 Kg/kWh for tariff determination purpose.

The Commission in its earlier tariff order dated 01 April 2013 (in SMP 13/2013) had considered the same values of specific fuel consumption.

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.

In view of above, the Commission decides to consider the specific fuel consumption equal to 1.6 kg/kWh for tariff determination purpose for control period of this order.

3.17 Station Heat Rate

Proposed in Approach Paper

The Commission in the approach paper has proposed Station Heat Rate as 3600 kCal/kWh for tariff determination purpose, which is same as considered by CERC in its Regulations 2020.

The Commission in its earlier tariff order dated 01 April 2013 (SMP 13 /2013) 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 depend 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 3600 kcal/kWh.

In view of above, the Commission decides to fix the normative value of Station Heat Rate as 3600 kcal /kWh for tariff determination purpose for the control period of this order.

3.18 Cost of Fuel

Proposed in Approach Paper

The Commission in the Approach paper has proposed fuel cost of Rs 1435 /MT for first year of control period (FY 2021-22) for determination of tariff for the Bagasse based Co-generation projects to be commissioned in control period of this order. The fuel cost was proposed to be escalated at the rate of 5% per annum over the life of the plant. The Commission has noted the fuel cost provided by CERC for 'other state' category in its RE Tariff Regulations 2020. Similarly, the approach followed by other SERCs in their states has also been noted.

In absence of information on the alternative use of bagasse and the market thereof, the Commission feels it more appropriate to determine the fuel cost for determination of tariff of Bagasse based Co-generation project by linking the same with the landed cost of sugarcane at sugar factories in the state. Accordingly, the cost of Bagasse was proposed by linking it to the administered price of sugarcane in the state. Considering 50% of the administered price (FRP) of sugarcane as the cost of bagasse, the cost of fuel was proposed as Rs 1435/MT for FY 2021-22.

Comments/Suggestions

Vide Commission's letter dated 15.06.2021, the Cane Commissioner, Directorate of Farmer Welfare & Agriculture Development, GoMP was asked to provide inputs on parameters proposed in approach paper especially for the cost of Bagasse. The Commission has received no comments in this regard.

Commission's View

The Commission decides to fix the fuel cost as Rs 1435/MT for the first year of control period (FY 2021-22) for tariff determination purpose. The fuel cost shall be escalated at the rate of 5% per annum over the tariff period.

3.19 Plant Load Factor

Proposed in Approach Paper

The Commission in the Approach paper has proposed to consider PLF of 53% for the projects to be commissioned in the control period this order. In the earlier control period tariff order also it was considered 53%. The normative PLF was arrived based on estimated operational period of typical sugar factory in the state i.e. 210 days (150 days of crushing season and 60 days of off-season). The CERC RE Tariff Regulations 2020 provides 53% PLF for the Bagasse based Co-generation projects in the 'Other states' category.

Comments/ Suggestions

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

Commission's View

In view of above, the Commission decides to consider the normative Plant Load Factor of 53% for tariff determination purpose for the control period of this order.

3.20 Auxiliary Consumption

Proposed in Approach Paper

The Commission in the approach paper has proposed normative auxiliary consumption at 8.5 % of gross generation for tariff determination purpose, similar to CERC Regulations.

The Commission in its earlier tariff order dated 01 April 2013 (SMP 13 /2013) had considered the same normative values for the auxiliary consumption.

Comments/ Suggestions

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

Commission's View

In view of above, the Commission decides to fix the normative value of auxiliary consumption as 8.5% of the gross generation for tariff determination purpose for the control period of this order.

3.21 Discount Factor

Proposed in Approach Paper

The MPERC RE Tariff Regulations 2017 define the discount factor as post-tax weighted average cost of capital (WACC). The CERC RE tariff Regulations 2020 also provides for same definition of discount factor. In line with above provisions, the Commission in the approach paper computed the discount factor as given below:

WACC = Cost of Debt + Cost of Equity
Cost of Debt =0.70 x (Market Rate of Interest) x (1- Corporate tax)
Cost of Equity = 0.30 x Return on Equity (i.e., normative 14%)

Interest Rate considered for the loan component (i.e., 70% of the capital cost) is 9%. For the equity component (i.e., 30% of the capital cost), the rate of Return on Equity (ROE) is considered at a post-tax rate of 14%, as a normative factor. Further, the Corporate Tax rate has been considered as 34.94% (30% for domestic companies, plus applicable surcharge (12%) and Health and Education Cess (4%)). The computation is given below:

Discount Factor (WACC) = [{(0.70 x 9%) x (1 – 34.94%)} + (0.30 x14%)] = 8.30%

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 discount factor as 8.30% for levellized tariff calculation in this order.

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

Proposed in Approach Paper

The Commission in the Approach Paper proposed to determine tariff without considering the subsidy /incentive by the Central / State Government. 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 suitable installments or within such period as may be specified by the Commission. 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.

For 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% to the projects during the first year of project commissioning is also available under the Income Tax Act. 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. The Commission has considered the above depreciation rate while calculating per unit AD benefit.

Following principles have been considered 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 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 levellised 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 by the Central / State Government. 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. MPPMCL shall incorporate appropriate provision in the Power Purchase Agreement executed with such project proponent /developer

For 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% to the projects during the first year of project commissioning is also available under the Income Tax Act. 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 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 levellised basis at a discounting factor equivalent to the post-tax weighted average cost of capital.

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 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 Bagasse based Co-generation Projects

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

Parameters for tariff determination of Bagasse based Co-generation projects

Parameters	Bagasse based Co-generation Projects
	Project Cost and O&M
Total Project Cost (Rs. Lakh/MW) Without Subsidy	466
Project Life in Years	25
Normative O&M Cost for First Year (Rs. Lakh/MW)	3% of Project Cost
Escalation in O&M (per annum from 2nd year)	3.84%
Performance Parameters	
PLF	53%
Auxiliary Consumption	8.5%
Station Heat Rate kCal/kWh	3600

Parameters	Bagasse based Co-generation Projects
Gross Calorific Value of Fuel kCal/kg	2250
Cost of Fuel Rs/Kg	1.435
Fuel Cost Escalation	5%
Financial Parameters	
Debt-Equity Ratio	70:30
Term of Loan in Years	15
Interest on Term Loan	9 %
Interest on Working Capital	10.5 %
Depreciation	4.67% (up to 15 years) 2% (16 to 25 years)
Base rate of Return on Equity	14 %
Minimum Alternate Tax (MAT)	17.47%
Corporate Tax rate	34.94%
Bagasse based Co-generation Power Projects Tariff without capital subsidy	
Levelized Fixed tariff (without AD)	Rs 1.91 kWh
AD Benefit	Rs 0.14 kWh
Levelized Fixed Tariff (with AD)	Rs 1.77 kWh
Levelized Variable Tariff	Rs 3.94 kWh
Total Levelized Tariff (without AD)	Rs 5.85 kWh
Total Levelized Tariff (with AD)	Rs 5.71 kWh

Detailed tariff computation sheet is enclosed as Annexure – I with this order.

6 Other Issues

Proposed in Approach Paper

In the Approach paper, the Commission has proposed arrangement for power purchase agreement between the Bagasse based Cogeneration project owner and MPPMCL, reactive energy charges applicable to Bagasse based Cogeneration projects as per provisions under relevant regulations / code notified by MPERC/CEA / CERC depending on the case. The Commission in the Approach paper also proposed 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 by the Bagasse based Co-generation projects will be procured centrally by the M.P. Power Management Co. Ltd. (MPPMCL) at the tariff determined by the Commission. The Power Purchase Agreement will be signed between the developer and the MPPMCL. The agreements will be for the 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 the 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 and the Commissioning Certificate may form a part of the agreement.

The 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 Bagasse based Co-generation 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 apply 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 the grid time to time. A rate of 27 paise per unit is prevalent presently in the state and the same would be applicable to Bagasse based Co-generation projects. Reactive energy charges as applicable would be paid by the developer to the Distribution Licensees in whose territorial area the Bagasse based Co-generation 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, Bagasse based Co-generation projects availing CDM benefit shall share the CDM proceeds annually as per above, by 31st 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 Bagasse based Co-generation projects like scheduling, Wheeling charges for Third-Party sale/captive consumption, Metering & Billing, payment mechanism, Default Provisions for Third-Party Sale or sale to utility, 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

No Comments/ suggestions were received from the stakeholders.

Commission's View

All other provisions which are not mentioned in this tariff order explicitly for Bagasse based Co-generation projects like scheduling, Wheeling charges for Third-Party sale/captive consumption, Metering & Billing, payment mechanism, Default Provisions for Third-Party Sale or sale to utility, Default Provisions for Third-Party Sale or sale to utility, etc. shall be guided by the provisions under the relevant Regulations of the Commission.

8 Applicability of the Order

The tariff determined in this order shall be applicable to all Bagasse based Cogeneration power project commissioned on or after the date of issue 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 31st March 2024 (i.e., end of FY 2023-24) 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 interested Bagasse based Co-generation project proponent/ generator at a tariff lower than the tariff determined by the Commission. The Bagasse based Co-generation projects commissioned during the control period of the previous Tariff order dated 1 April 2013 (in SMP 13/2013) shall be governed by the terms and conditions given in the said tariff order.

The Commission shall endeavour to adopt the tariff to be determined through transparent process of competitive bidding as and when such guidelines are notified by the Central Government.

(Shashi Bhushan Pathak)	(Mukul Dhariwal)	(S.P.S Parihar)
Member	Member	Chairman

Place: Bhopal

Date: 19 /08/2021

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Annexure – I

Tariff Computation for Bagasse based Co-generation Power Projects

Year	1	2	3	4	5	6	7	8	9	10	11	12	13
MW	1	1	1	1	1	1	1	1	1	1	1	1	1
Net Energy sold (lakh kWhs)	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51
O&M	13.98	14.52	15.07	15.65	16.25	16.88	17.53	18.20	18.90	19.62	20.38	21.16	21.97
Depreciation	21.75	21.75	21.75	21.75	21.75	21.75	21.75	21.75	21.75	21.75	21.75	21.75	21.75
Interest on term loan	28.38	26.42	24.47	22.51	20.55	18.59	16.64	14.68	12.72	10.76	0.73	0.57	0.41
Interest on working capital	3.81	3.90	3.98	4.08	4.18	4.29	4.40	4.52	4.65	4.79	4.79	4.97	5.17
Return on equity	23.72	23.72	23.72	23.72	23.72	23.72	23.72	23.72	23.72	23.72	23.72	23.72	23.72
Fixed cost (Rs Lakh)	91.63	90.30	88.99	87.70	86.45	85.22	84.03	82.86	81.73	80.64	71.36	72.17	73.01
Variable cost (Rs Lakh)	106.67	112.01	117.61	123.49	129.66	136.14	142.95	150.10	157.60	165.48	173.76	182.44	191.57
Fixed cost (Rs/kWh)	2.16	2.12	2.09	2.06	2.03	2.00	1.98	1.95	1.92	1.90	1.68	1.70	1.72
Variable Cost (Rs/kWh)	**2.51**	2.63	2.77	2.90	3.05	3.20	3.36	3.53	3.71	3.89	4.09	4.29	4.51
Discounting Factor		8.30%											

Year	14	15	16	17	18	19	20	21	22	23	24	25
MW	1	1	1	1	1	1	1	1	1	1	1	1
Net Energy sold (lakh kWhs)	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51	42.51
O&M	22.82	23.69	24.60	25.55	26.53	27.55	28.60	29.70	30.84	32.03	33.26	34.54
Depreciation	21.75	21.75	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32	9.32
Interest on term loan	0.24	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	5.37	5.59	5.59	5.83	6.08	6.34	6.61	7.01	7.31	7.63	7.96	8.31
Return on equity	23.72	23.72	23.72	23.72	23.72	23.72	23.72	30.08	30.08	30.08	30.08	30.08
Fixed cost (Rs Lakh)	73.89	74.82	63.23	64.41	65.64	66.92	68.25	76.12	77.56	79.06	80.62	82.25
Variable cost (Rs Lakh)	201.15	211.20	221.76	232.85	244.49	256.72	269.55	283.03	297.18	312.04	327.64	344.03
Fixed cost (Rs/kWh)	1.74	1.76	1.49	1.52	1.54	1.57	1.61	1.79	1.82	1.86	1.90	1.93
Variable Cost (Rs/kWh)	4.73	4.97	5.22	5.48	5.75	6.04	6.34	6.66	6.99	7.34	7.71	8.09
Discounting Factor												

Levellised Cost Tariff	Tariff
Levelized Fixed tariff (without AD)	Rs 1.91 kWh
AD Benefit	Rs 0.14 kWh
Levelized Fixed Tariff (with AD)	Rs 1.77 kWh
Levelized Variable Tariff	Rs 3.94 kWh
Total Levelized Tariff (without AD)	Rs 5.85 kWh
Total Levelized Tariff (with AD)	Rs 5.71 kWh