SMP-13/2013

M.P. Electricity Regulatory Commission
Bhopal

Tariff Order
for
procurement of power
from
Bagasse based cogeneration plants
in Madhya Pradesh

April 2013

1. LEGISLATIVE PROVISIONS

1.1 Section 86(1) (e) of the Electricity Act 2003 (EA,2003 or the Act), mandates the State Electricity Regulatory Commissions to 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. The Regulatory Commissions are also required to specify, for the purchase of electricity from such sources, a percentage of the total consumption of electricity in the area of a distribution Licensee. Further the Act, under Section 62, empowers the Commissions to determine the tariff for the supply of electricity by a generating company to a distribution Licensee in accordance with the provisions of the Act. Also, Section 61 provides that the Commission shall specify the terms and conditions for the determination of tariff, and in doing so, be guided by the principles listed in Clauses (a) to (i) of that Section. Section 61(h) and 61(i) are re-produced below:

"61(h) the promotion of co-generation and generation of electricity from renewable sources of energy;"

"61(i) the National Electricity Policy and tariff policy:"

1.2 Section 6.4 of the Tariff Policy dealing with Non-conventional sources of energy generation including co-generation provides as under:-

(1) Pursuant to provisions of section 86(1)(e) of the Act, the Appropriate Commission shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Such percentage for purchase of energy should be made applicable for the tariffs to be determined by the SERCs latest by April 1, 2006.

It will take some time before non-conventional technologies can compete with conventional sources in terms of cost of electricity. Therefore, procurement by distribution companies shall be done at preferential tariffs determined by the Appropriate Commission.

(2)Such procurement by Distribution Licensees for future requirements shall be done, as far as possible, through competitive bidding process under Section 63 of the Act within suppliers offering energy from same type of non-conventional sources. In the long-term, these technologies would need to compete with other sources in terms of full costs.

(3)The Central Commission should lay down guidelines within three months for pricing non-firm power, especially from non–conventional sources, to be followed in cases where such procurement is not through competitive bidding.

1.3 The Central Electricity Regulatory Commission has issued revised guidelines vide notification dated 06.02.2012 specifying the norms for various non-conventional sources of energy including power from non-fossil fuel based cogeneration projects such as bagasse based cogeneration plants.

1.4 Hence, in exercise of the powers vested in it under Section 86(1)(a), (b) ,(c) and (e); and Section 62(1) of the Act and all other powers enabling it in this behalf, the Madhya Pradesh Electricity Regulatory Commission (Commission), through this order, determines the tariff, procurement process and related dispensation for purchase of power by Distribution Licensees in the State from bagasse based cogeneration plants including terms and conditions for captive user or third party sale.

2. PROCEDURAL HISTORY

2.1 The Commission had issued a tariff order for procurement of power from bagasse based cogeneration plants on 03.09.2008. The control period expired on 31.03.2013.

3. REGULATORY PROCESS FOR NEXT CONTROL PERIOD

3.1 The Commission had issued a public notice on 26.02.2013 inviting comments/suggestions/objections from various stakeholders by 18.03.2013. A public hearing was held on 19.03.2013. None of stakeholders have submitted the comments either in writing or orally during the hearing.

3.2 While arriving at the new terms and conditions and consequently the tariff for generation of power from bagasse based cogeneration plants, the Commission has considered the Guidelines issued by CERC for determination of tariff for procurement of power from renewable energy sources.

4. APPLICABILITY OF THE ORDER

4.1 This tariff Order will be applicable to all new bagasse based cogeneration plants in Madhya Pradesh commissioned on or after 01.04.2013 for sale of electricity to the distribution licensees within the state. This order also specifies the terms & conditions (other than tariff) for captive user or for sale to third party.

4.2 It will be mandatory for the distribution licensees to submit to the Commission, quarterly progress reports on the capacity addition, purchase of energy and other relevant details in respect of bagasse based cogeneration projects commissioned in their licensed area, and also post them on their websites on a regular basis.

5. TARIFF REVIEW PERIOD/CONTROL PERIOD

5.1 The control period to which this order shall apply shall start from 01.04.2013 and will end on 31.03.2016 (i.e. end of FY 2015-16). The tariff decided in this order shall apply to all projects which come up during the above mentioned control period and the tariff determined shall remain valid for the project life of 20 years.

6. MECHANISM FOR TARIFF DETERMINATION

6.1 In its earlier tariff order, the Commission had adopted a year wise tariff approach. CERC has recommended levelized tariff approach. The Commission has, therefore, adopted levelized tariff approach in this order.

BENCHMARKING

6.2 Benchmarking generally requires evaluation, detailed scrutiny and determination of each cost parameter for each project separately. There is a considerable diversity in the value of various parameters across projects, such as plant capacity, project cost, fuel cost, financing plan etc.

6.3 A 'Benchmark Tariff Determination' approach has been used by the Commission and the cost of generation on benchmark performance norms has been arrived at.

SINGLE PART VS. TWO PART TARIFF

6.4 Normally, two part tariff is applied in order to separately recover fixed and variable costs through the fixed and variable components of tariff.

6.5 CERC has worked out single part tariff. The Commission has also adopted single part tariff approach.

PROJECT SPECIFIC OR GENERALIZED TARIFF

6.6 A Generalized tariff mechanism would provide an incentive to the investors for use of most efficient equipment to maximize returns and for selecting the most efficient site. The process of project specific tariff fixation will be cumbersome and time consuming. It has, therefore, been decided to use common tariff for all the bagasse based cogeneration plants using common benchmark technique.

FRONT/BACK LOADED OR LEVELIZED TARIFF

6.7 In case tariff is front loaded the developer may lose interest in the project after enjoying the benefits of front loading. In a back loaded tariff, the developer may not be able to meet his loan servicing liability due to inadequacy of cash flow. The Commission has, therefore, decided to adopt a levelized approach towards tariff determination so as to balance the interests and requirements of various stakeholders.

7. TARIFF DESIGN

7.1 The Working Group constituted by the Forum of Regulators (FOR) for Policies on Renewables have, in their recommendations, suggested that a cost-plus tariff based on reasonable norms should be adopted for Renewable Energy. Keeping in view the above recommendations, the Commission has adopted an approach of preferential treatment on a cost-plus basis for determining tariff for the bagasse based cogeneration plants. In a cost plus approach, the key elements that influence the determination of tariffs for such projects are:

- Capital Cost
- Plant Load Factor
- Operation & Maintenance Cost
- Plant life
- Depreciation
- Return on Equity
- Interest on debts
- Debt-Equity Ratio
- Fuel price
- Interest on working capital
- Station Heat Rate
- Gross Calorific Value
- Auxiliary consumption

Capital Cost (including cost of infrastructure)

7.2 Capital Cost is the most critical element in tariff determination. This comprises cost of land, plant and machinery, civil works, erection, commissioning, cost of power evacuation and other related expenses.

7.3 In the approach paper, the Commission had proposed capital cost of Rs. 5.75 Crs./MW inclusive of power evacuation cost, without indexation .

7.4 In its Regulations dated 06.02.2012, CERC has considered capital cost of Rs. 4.20 Crores/MW for 2012-13 with a provision of indexation for future years. In its order dated 25.10.2012, CERC has adopted Capital Cost of Rs. 4.36 Crores/MW for FY 2013-14.

Plant Load Factor

7.5 Plant load factor (PLF) depends on several factors such as quality, capacity and age of machines installed, availability of fuel etc.

7.6 In its Regulations 06.02.2012, CERC suggested PLF as 53%. In its earlier order, the Commission had considered PLF as 55%. In the approach paper, the Commission had proposed plant load factor of 53%.

O & M expenses

7.7 The operation and maintenance expenses comprise manpower expenses, insurance expenses, spares and repairs, consumables and other expenses (statutory fees etc.). Normally, the maintenance of bagasse based cogeneration plant is carried out through a maintenance system of main plant which results in a lower amount of manpower expenses as well as administrative and general expenses. In its earlier tariff order, the Commission had considered O&M expenses as 3% of Capital Cost for the first year and thereafter with an annual escalation at 5%.

7.8 In the approach paper, the Commission had proposed operation and maintenance expenses as 3% of Capital Cost for the first year and thereafter an escalation of 5.72 % per year.

7.9 In its Regulations dated 06.02.2012, CERC has considered O&M expenses as 16 lakhs per MW per annum with escalation @ 5.72% per annum.

Plant Life

7.10 In the approach paper, the Commission had proposed plant life as 20 years. In its Regulations dated 06.02.2012,CERC have also taken plant life as 20 years.

Depreciation

7.11 In the approach paper, the Commission had proposed depreciation @ 7% per annum for the first 10 years and remaining 20% to be spread over the useful life of the plant from 11^{th} year onwards. In its Regulations dated 06.02.2012, CERC considered the depreciation @ 5.83 % for first 12 years and balance in 8 years.

Return on equity

7.12 In the approach paper, the Commission had proposed return on equity as 20% pre-tax. In its Regulations dated 06.02.2012, CERC considered the return on equity @ 20 % for the first 10 years and @ 24 % from 11^{th} year onwards. In its earlier order, the Commission had allowed return on equity (RoE) @ 16% pre-tax.

Interest on Debt

7.13 In the approach paper, the Commission had proposed interest on debt @ 13% per annum. In its Regulations dated 06.02.2012, CERC has recommended interest on debt for computation purposes as average State Bank of India Base rate prevalent during the first six months of the previous year plus 300 basis points, which works out to 13 %.

Debt - Equity Ratio

7.14 In its approach paper, the Commission had proposed debt-equity ratio of 70:30. The Clause 5.3(b) of the Tariff Policy also stipulates a debt-equity ratio of 70:30 for financing power projects. In its earlier tariff order, the Commission had considered debt-equity ratio of 70:30. In its Regulations dated 06.02.2012, CERC also considered debt-equity ratio of 70:30.

Fuel cost

7.15 In the approach paper, the Commission had proposed the fuel cost @ Rs. 1583 per tonne with an escalation @ 5% per annum. In its Regulations dated 06.02.2012, CERC also considered the fuel cost @ Rs. 1583 per tonne and linked to indexation formula with an alternative of escalation @ 5% per annum at the option of the project developer.

Interest on Working Capital

7.16 In the approach paper, the Commission had proposed an interest on working capital @ 13.5% per annum. In its Regulations dated 06.02.2012, CERC has recommended interest on working capital for computation purposes as average State Bank of India Base rate prevalent during the first six months of the previous year plus 350 basis points, which works out to 13.5 % and the amount of working capital to be calculated using the following norms:

a) O&M expenses for 1 month

b) Receivables equivalent to 2 months of energy charges

c) Maintenance spares @ 15% of O&M expenses.

d) Fuel cost for four months equivalent to normative PLF.

Auxiliary consumption

7.17 In the approach paper, the Commission had proposed auxiliary consumption @ 8.5 %. In its Regulations dated 06.02.2012, CERC also considered auxiliary consumption @ 8.5%. In its earlier tariff order, the Commission has taken auxiliary consumption @ 8%.

Station Heat Rate

7.18 In the approach paper, the Commission had proposed the Station Heat Rate @ 3600 kCal/Kwh. In its Regulations dated 06.02.2012, CERC also considered the Station Heat Rate @ 3600 kCal/kwh. In its earlier tariff order, the Commission has taken Station Heat Rate @ 3700 kCal/kwh.

Gross Calorific Value

7.19 In the approach paper, the Commission had proposed the Gross Calorific Value@ 2250 kCal/kg. In its Regulations dated 06.02.2012, CERC also considered the Gross Calorific Value @ 2250 kCal/kg. In its earlier tariff order, the Commission has taken Gross Calorific Value @ 2300 kCal/kg.

8. FIXATION OF NORMS AND DETERMINATION OF TARIFF

Commission's views:

Capital cost:

8.1 As brought out earlier, capital cost depends on various factors and therefore a reasonable capital cost shall have to be considered on a uniform basis for the purpose of tariff determination.

8.2 The Commission is of the view that it would be reasonable to adopt the norms used by CERC at Rs. 4.36 Cr./MW including cost of power evacuation system for the control period without indexation.

Return on Equity:

8.3 Keeping in view requirements of the tariff policy for preferential tariff for renewable sources of energy, the Commission has decided to allow RoE @ 20 % pre-tax.

O&M expenses:

8.4 Considering the CERC norms and the fact that the maintenance of such plants require lower expenses, the Commission has decided that it would be appropriate to allow 3% of the capital cost of the project as O&M expenses in the first year with an escalation of 5% for each year thereafter.

Interest on debt:

8.5 Considering the CERC norms and taking the present average base rate of SBI at 10%, the Commission has decided that it would be appropriate to allow interest on debt at a fixed rate of 13 %.

Interest on working capital:

8.6 Considering the CERC norms and taking the present average base rate of SBI at 10%, the Commission has decided that it would be appropriate to allow interest on debt at a fixed rate of 13.5 % and the amount of working capital to be calculated using the following norms:

e) O&M expenses for 1 month

f) Receivables equivalent to 2 months of energy charges

g) Maintenance spares @ 15% of O&M expenses.

h) Fuel cost for four months equivalent to normative PLF.

Depreciation:

8.7 The Commission has decided that for the purpose of tariff determination, it would be prudent to assume depreciation @ 7% per annum for the first 10 years so that the debt is repaid and balance 20 % to be depreciated in the next 10 years so that the assets are depreciated to a residual value of 10% of the initial value over its life of 20 years.

Other norms:

8.8 The Commission has decided that it would be appropriate to adopt the norms as specified by the CERC in its Regulations 06.02.2012 in respect of the following:

(i) Plant Load Factor

(ii) Plant Life

(iii) Debt-Equity Ratio

(iv) Fuel Price

(v) Station Heat Rate

(vi) Gross Calorific Value

(vii) Auxiliary Consumption

8.9 In view of the foregoing discussions, the Commission decides to fix the following norms for determination of tariff:

S. No.	Parameters	As decided by the Commission
1	Capital Cost (Rs. Lakhs per MW) including cost of power evacuation	436
2	Plant Load Factor (%)	53
3	Operation & Maintenance Expenses(Rs. Lakhs per annum))	3% of the capital cost in first year with an escalation of 5 % for each year thereafter.
4	Plant life (years)	20
5	Depreciation (%)	7% per annum for the first 10 years and balance 20% in the next 10 years
6	Return on Equity (%)	20% pre-tax
7	Interest on Debt (%) per annum	13
8	Debt-equity ratio	70:30
9	Interest on working capital on (%) (i) O&M expenses for 1 month (ii) Receivables equivalent to 2 months of energy charges based on normative CUF (iii) Maintenance spares @ 15% of O&M expenses (iv) Fuel cost for four months equivalent to normative PLF	13.5
10	Fuel Cost (Rs./MT)	1583
11	Fuel cost escalation (per annum)	5%

12	Station Heat Rate (kCal./kwh)	3600
13	Gross Calorific Value (kCal./kg.)	2250
14	Auxiliary consumption (%)	8.5

Discounting Factor:

8.10 In its order dated 25.10.2012, CERC has considered a discounting factor @ 10.95 % based on the post tax weighted average cost of capital on the basis of normative debt: equity ratio (70:30) for the purpose of working out the levelized tariff. The Commission has decided that it would be appropriate to use discounting rate of 10.20%.

8.11 Considering the above parameters, the Commission sets the levelized tariff **@ Rs. 6.28 per unit** for generation from new bagasse based cogeneration projects to be commissioned on or after 01.04.2013 for project life of 20 years.

9. OTHER TERMS AND CONDITIONS

9.1 The Tariff determined for the licensee shall be exclusive of taxes and duties as may be levied by the State Government.

9.2 A review of the Tariff Rate before the expiry of the control period may be undertaken by the Commission under exceptional circumstances, if the need for such review is clearly demonstrated with adequate supporting material.

9.3 The Tariff Rates shall be firm for the project life and will not vary with fluctuations in exchange rate etc.

Power Purchase Agreement and Tenure

9.4 The energy generated by the bagasse based cogeneration projects will be procured centrally by the M.P. Power Management Co. Ltd. at the rates specified in this order. The energy so procured will be allocated by M.P. Power Management Co. Ltd. to the three distribution licensees on the basis of actual energy input in the previous financial year. Accordingly, the Power Purchase Agreements will be signed between the developer and the M.P. Power Management Co. Ltd. The M.P. Power Management Company Limited, Jabalpur, in turn, will have back to back power supply agreement with the Distribution Licensees. The agreements will be for exclusive sale of electricity for a period of 20 years from the date of commissioning of plant. The developer may execute agreement with M.P. Power Management Co. Ltd. before commissioning of plant and the Commissioning Certificate may form a part of the agreement. The M.P. Power Management Company Limited, Jabalpur is directed to develop the model agreement accordingly.

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

Scheduling

9.6 The bagasse based cogeneration projects are presently out of the purview of 'scheduling'. However, they may be subjected to 'scheduling' as and when a decision is taken by the Commission in this regard.

Reactive Power Supply

9.7 The bagasse based cogeneration 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.

9.8 The Commission determines the charges for KVARh consumption from the grid as 27 paise/unit i.e. the rate which is already prevalent in the State and which may be revised as and when necessary.

9.9 Reactive energy charges would be paid by the developer to the Distribution Licensees in whose territorial area the bagasse based cogeneration project is located.

Wheeling charges for third party sale/captive consumption

9.10 The Distribution Company in whose area the energy is consumed (irrespective of the point of injection) shall deduct 2% of the energy injected towards wheeling charges in terms of units. The M.P. Power Management Company Limited shall also claim subsidy from the State Government towards wheeling charges @ 4% of the energy injected at the rate of prevailing energy charges for the user in terms of provisions made in Government of M.P. Policy for encouraging generation of power in M.P. through Non-conventional Energy Sources notified on 17.10.2006 as amended from time to time. This amount of subsidy shall then be passed on to the Distribution Licensees in whose area the energy is consumed on the basis of allocation indicated in the agreement. Wheeling charges are not applicable where generation and consumption of energy are at the same premises without involving the system network of the licensees.

Metering & Billing

9.11 Metering arrangement is to be done at site.

9.12 Billing of metered energy will be carried out on a monthly basis.

9.13 Meter reading will be carried out by the respective Distribution Licensees where the energy is injected into the system.

Payment Mechanism

9.14 The Commission specifies a settlement period of 30 days from the date of submission of the bill to the concerned Distribution Licensees where the power is injected in order to ensure that the developer has an assurance of cash inflow for the energy, which he delivers to the grid.

9.15 The bills favouring M.P. Power Management Company Limited, Jabalpur shall be submitted to the concerned distribution licensee in whose area the power is injected. The distribution licensee shall then verify the bills and send the same within 7 days of receipt of bills to the M.P. Power Management Company Limited, Jabalpur for making payment to the developer. The M.P. Power Management Company Limited in turn, would raise the bills on the distribution licensees on the basis of allocation. In case any dispute arises on the bills for payment then the M.P. Power Management Co. Ltd. is required to make the payment of such bill in full within the stipulated time and then refer the dispute to the Commission.

9.16 In case of delay beyond the 30 days payment period, the M.P. Power Management Co. Ltd. will pay **delayed payment surcharge on outstanding amount at the rate of 2% p.a. over and above the short term lending rate of the State Bank of India** (known as Prime Lending Rate) prevailing on the first day of the month when the payment became due.

9.17 In case the M.P. Power Management Co. Ltd. makes the payment within 15 days from the date of submission of bill by developer, an **incentive of 1% of billed amount** shall be allowed by the developer towards prompt payment. Alternatively, if the payment is made by the M.P. Power Management Co. Ltd. to the developer through irrevocable letter of credit on presentation of bill, **an incentive of 2% of billed amount** shall be allowed by the developer.

9.18 The delayed payment surcharge/incentive will also be passed on to the Distribution Licensees by the M.P. Power Management Co. Limited.

9.19 The M.P. Power Management Co. Ltd., Jabalpur shall submit by 15th of the month following the end of the quarter to the Commission(ending June, September, December and March) the details of bills pending for payment at the end of the quarter along with reasons thereof.

Default Provisions for Third Party Sale or sale to utility

9.20 In case payment is not made within 60 days of presentation of bill (i.e. thirty days more than the specified limit of thirty days for normal payment), the developer may issue fifteen clear days' notice to the M.P. Power Management Company Limited to make the payment. This, however, will not absolve M.P. Power Management Company Limited from payment of delayed payment surcharge as provided in clause 12.16 of this order. In case, M.P. Power Management Company Limited still does not make the payment, the developer shall have the liberty to approach the Commission for allowing sale of power to third party.

9.21 Where the developer has an arrangement for third party supply or for captive consumption and desires to terminate such agreement with third party and to supply to the utility, the utility with the prior permission of the Commission, will purchase the power at the rate as applicable to inadvertent flow of energy mentioned in para 9.22 below. In such cases, the developer shall be required to execute the Power Purchase Agreement with the licensee for the remaining period of project life.

9.22 In case of inadvertent flow of energy into the system by the generator, the licensee shall pay to the developer for the energy received at **Rs. 2.25 per unit**.

9.23 The project developer is required to obtain Short/ Long Term Open Access permission in case of captive use/ third party sale. Open access charges, as applicable, shall be levied. In case of sale of power to the Distribution Licensee, such permission is not applicable and is not required to be obtained.

Drawing of Power during Shutdown

9.24 The plant would be entitled to draw power from the Distribution Licensee's network during shutdown period or during other emergencies. The supply availed would be billed at the temporary rate applicable to HT Industrial category. The drawl by the Plant would not normally be expected to exceed 10% of the MW capacity it delivers to the Distribution licensee.

Other applicable conditions

9.25 All statutory clearances and necessary approvals, if any, are to be obtained by the developer for setting up of project through Department of Non-conventional Energy Sources. The developer is also responsible for compliance and renewals as may be required from time to time.

9.26 The developer would ensure that the proposed location of the plant is in accordance with the policy guidelines of the Union/State Government.

9.27 Other conditions in respect of minimum purchase requirement, banking and reduction in contract demand shall be applicable as per MPERC (Cogeneration and Generation of Electricity from Renewable Sources of Energy) Regulations, 2008 as amended from time to time.

9.28 In its Regulations dated 06.02.2012, the CERC has specified the sharing of Clean Development Mechanism benefits which is as under.

" The CDM benefits should be shared on a gross basis, starting from 100% to developers in the first year after commissioning and thereafter reducing by 10% every year till the sharing becomes equal (50:50) between the developers and the consumers, in the sixth year. Thereafter, the sharing of CDM benefits should remain equal till the time that benefit accrues."

The Commission is of the view that there are uncertainties associated with bagasse based cogeneration projects such as fixed tariff for entire life of the plant, availability of raw material, withdrawal of advance against depreciation etc. The Commission is also guided by the fact that it would be in the larger interest of the State that available potential for generation of power from renewable energy sources is exploited to the maximum extent so that all Obligated Entities are able to fulfill their Renewable Purchase Obligations. This would also avoid or minimize the need for purchase of RECs (Renewable Energy Certificates).

In view of the above, the Commission has decided that the generator may retain 100 % benefits without sharing these with the consumers during the currency of the present control period namely 01.04.2013 to 31.03.2016.

9.29 In case the point of injection and drawl fall within the jurisdiction of any of the Distribution Licensees involving transmission network, permission for bulk power transmission shall be obtained from M.P. Power Transmission Co. by the developer before executing the agreement with M.P. Power Management Co. and the developer shall not be required to execute a separate agreement with M.P. Power Transmission Company Limited.

9.30 All existing projects i.e. projects commissioned before 01.04.2013 shall continue to be governed by the terms and conditions applicable at the time of their commissioning.

Ordered accordingly.

sd/-	**sd/-**	**sd/-**
(Alok Gupta)	**(A.B.Bajpai)**	**(Rakesh Sahni)**
Member	**Member**	**Chairman**

Place : Bhopal
Date : 01.04.2013