M. P. Electricity Regulatory Commission

Tariff Order
for procurement of power from
Biomass based generation

7th August 2007

LEGISLATIVE PROVISIONS

1.1 Section 86(1) (e) of the Electricity Act 2003, 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 Commissions specify the terms and conditions for the determination of tariff and, in so doing, be guided by the principles listed in Clauses (a) to (i) of that Section.

1.2 As per the Proviso 6, of section 6.4 of National Tariff Policy, it has been recognised that it will take some time for the non-conventional energy sources to compete with conventional sources of energy, hence its procurement shall be done at preferential tariffs to be determined by the Commissions and states as under:

(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.

Although the Central Electricity Regulatory Commission has issued a concept paper, it has not issued the guidelines so far.

1.3 Hence, in exercise of the powers vested in it under Section 86(1)(a), (b) and (c) read with (e), and Section 62(1) of the Electricity Act, 2003 (EA, 2003) 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 the purchase of power by Licensees in Madhya Pradesh from biomass based generators in the State.

2. REGULATORY PROCESS

2.1 The Commission had issued an Approach Paper on 12.10.06 towards “Installation of Bio-mass Power Plant and Fixation of unit rate of Energy for sale to the Licensee” to invite comments/suggestions from all stakeholders by 31.10.06. Further, a Public hearing was held on 29.11.06 at the Commission’s Office. The following organisations had participated in the hearing and gave their comments on the norms specified in the Approach paper:

Serial Number	Name of organisation
1	M.P Electricity Consumers Society , Indore
2	Consolidated Energy Consultants Limited , Bhopal
3	Anant Spinning Mills
4	Shalivahana Group, Secunderabad
5	Saurabh Power Generation Pvt. Ltd.(SPG) , Bhopal
6	Hema Sri Power Projects Ltd. , Suryapet (A.P.)
7	M.P. Power Transmission Company Ltd , Jabalpur
8	M.P. Power Trading Company Ltd , Jabalpur
9	M.P. Paschim Kshetra Vidyut Vitran Co. Ltd. ,Indore

2.2 The State Nodal Agency, Madhya Pradesh Urja Vikas Nigam Limited (M.P.Urja Vikas Nigam Ltd.) also submitted its views on the draft paper and suggested parameters for the calculation of tariff for electricity procured from Biomass based energy projects.

2.3 The Commission has analysed the tariffs issued by other State Electricity Regulatory Commissions, comments/objections from different stakeholders, facts on biomass based generation from various sources including M.P.Urja Vikas Nigam Ltd., current market costs for coal (of a typical thermal plant within the State of M.P.) and guidelines of Central Electricity Regulatory Commission and Central Electricity Authority for the determination of tariff for procurement of power from renewable energy sources. Accordingly, the Commission issues the following order to meet the requirements of the Electricity Act, 2003.

3. APPLICABILITY OF THE ORDER

3.1 The tariff Order issued by the Commission will be applicable to all biomass based power generation projects in the State of Madhya Pradesh commissioned on or after the date of issue of this order and intended for sale of electricity to the distribution licensees within Madhya Pradesh.

3.2 It is made mandatory for the Licensees to submit to the Commission quarterly progress reports on the capacity addition, purchase of energy and other relevant details in respect of biomass based generation projects commissioned in their licensed area, and also post them on their websites on a regular basis.

4. TARIFF REVIEW PERIOD/CONTROL PERIOD

4.1 The control period shall be of five years. The first control period will start from the date of issue of this order and will close at the end of FY11-12 i.e. 31.3.2012. The tariff determination process may be reviewed nine months before the end of the control period. The tariff decided in a particular control period shall apply to all projects which come up within that control period and the tariff determined for a project shall remain in effect for the whole project life of 20 years from the date of grid connectivity.

5. MECHANISM FOR TARIFF DETERMINATION

5.1 The Commission has adopted the cost plus approach to determine tariff for procurement of power from biomass based generation. The cost-plus approach to tariff determination would ensure that the investors are protected for the cost and associated risks.

5.2 Consequent to this, the Commission adopts benchmarking of costs as detailed below.

Benchmarking

5.3 This approach generally requires evaluation, detailed scrutiny and determination of each cost parameter for each Project separately. There will be considerable diversity in the value of parameters across the Projects, such as in respect of plant capacity, configuration, boiler technology (pressure levels), biomass fuel mix and availability, SHR, fuel procurement and storage plan, project cost, financing plan, etc.

5.4 In absence of availability of such extensive data in Madhya Pradesh , owing to very less biomass based power capacity, the approach for benchmarking was done by following means:

a) Normative benchmarking based on guidelines of Central Electricity Authority and Central Electricity Regulatory Commission.

b) Analysis of tariff orders issued by various State Electricity Regulatory Commissions.

c) M.P.Urja Vikas Nigam Ltd.'s response to approach paper on procurement of electricity from Biomass based power stations.

d) Cost details received from project proponents.

e) Indian Renewable Energy Development Agency, Ministry of New and Renewable Energy Sources and Appellate Tribunal for Electricity.

5.5 Regulatory clarity and certainty in Tariff setting is necessary from the perspective of the developers, investors and lenders, in order to support investments in non-fossil fuel energy projects such as those based on biomass, which are still at the nascent stage of growth in Madhya Pradesh. Thus, while there is merit in setting a uniform tariff level for the biomass based power Projects, it is also necessary to set out clearly its premises and rationale. A 'Benchmark Tariff Determination', based on performance standards in terms of specific fuel consumption, auxiliary consumption, Plant Load Factor, prices of fuel, etc. has been made by the Commission and the cost of generation on benchmark performance norms has been arrived at by the Commission.

Single Part vs. Two Part Tariff

5.6 Normally, two part tariff is applied in order to recover fixed and variable costs through the fixed and variable components of tariff separately. Two part tariff is also used where the proportion of variable components in tariff is quite large.

5.7 For the ***Biomass***, taking into consideration their contribution to the total generation handled by the State Grid, **single part tariff appears appropriate** as the Commission believes that the implementation of two part Tariff may involve a large administrative machinery for monitoring & settlement.

Project Specific or Generalized Tariff

5.8 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 is proposed to use a generalized benchmark tariff for all the biomass based power plants.

Front Loaded or Back Loaded tariff

5.9 In case tariff is front loaded the developer can switch to third party sale etc. after enjoying the benefits of front loading. In a back loaded tariff, the developer may not be able to meet his loan liability. The Commission, therefore, decides to adopt the cost plus approach towards tariff determination so as to balance the requirement of various stakeholders.

6. TARIFF DESIGN

6.1 In a cost plus approach, the tariff would depend upon the assumptions on investment costs, operating costs, financing costs and the operating parameters. The key elements that influence the determination of tariffs are mentioned below :

- Capital Cost
- O&M Cost
- Fuel Cost
- Gross Calorific Value
- Debt-Equity Ratio
- Interest Cost
- Depreciation
- Interest on working capital
- Return on Equity

Capital Cost

6.2 Various stakeholders have submitted following views:

a) Consolidated Energy Consultants Limited , Bhopal states that the Capital cost along with cost of plantation of fuel wood tree (to ensure availability of wood) shall be Rs. 4.5 Cr/ MW

b) Shalivahana Group, Secunderabad (A.P.) suggested capital cost of Rs. 4.10/ MW

c) Hema Sri Power Projects Ltd. Suryapet (A.P.) suggests Rs. 4.25 – 4.50 crores/MW (due to use of sophisticated machinery and updates)

6.3 As per incentive policy for encouraging generation of power in Madhya Pradesh through Non-conventional Energy sources (solar, wind, bio-energy etc.) issued vide notification dated 17.10.06 by the Government of Madhya Pradesh, the power evacuation will be an integral part of the project and all expenses for power evacuation facility shall be borne by the unit.

6.4 As per M.P. Urja Vikas Nigam Ltd., the cost of infrastructure has to be included in the cost of project itself under the new biomass policy of the State Government. It has proposed Rs. 25 lakhs towards cost of infrastructure for Biomass power plants in M.P.

Commission's views

6.5 The project cost varies on account of various factors including location of the project, capacity, technology etc. There are very few biomass based power plants in Madhya Pradesh and not much data are available.

6.6 The Commission considers Rs. 4.25 Crs. per MW as a reasonable project cost including infrastructure cost (cost of transmission/distribution lines etc.) for computation of tariff.

Use of Fossil Fuel by Projects

6.7 In Madhya Pradesh, the biomass fuel availability is likely to vary from year to year and also over a period. Biomass availability is critically dependent on several factors such as variations in cropping patterns and rainfall in different areas, improvements in irrigation techniques, consumption/surplus utilisation patterns, etc. Therefore, in order to augment the fuel required and to optimally utilise the power plant assets by maximizing electricity generation round the year, it is necessary to allow the use of fossil fuel to a limited extent due to the cyclical and seasonal nature of the crop residues.

6.8 The Ministry Of Non-Conventional Energy Sources guidelines (3/4/2003-CPG Biomass Energy and Co-generation Programmes – Administrative Approval for the year 2003-04) also state that -

"Fossil fuel up to 25% will be allowed in biomass power and Bagasse cogeneration projects as support fuel to achieve extended operating days in a year."

6.9 The order given by Appellate Tribunal in the case of Chhattisgarh Biomass power developers " *Biomass mainly Rice-husk could be considered to be available for purchase in the market at Rs. 850/- per M.T. The price of supplementary fuel permissible at 25% of coal of the total fuel quantity be also priced along with 75% rice-husk to obtain the aggregate cost of fuel. An escalation on fuel cost at the rate of 5% p.a. be provided. However, the commission may also develop a mechanism of fuel cost adjustment (FCA) so that the* variation in cost of the fuel could be extended on actual basis, as and when it occurs"

6.10 M.P.Urja Vikas Nigam Ltd. has also proposed to allow use of 25 % coal for Biomass based power plants. It also pointed out that the landed cost of coal would be Rs. 2 / kg (as procured from traders) with a calorific value of 3400 kcal/ kg.

Commission's views

6.11 Keeping in mind the availability of biomass, the Commission approves 25% usage of Coal as a fuel for biomass based power projects.

Monitoring of Fossil fuel

6.12 If the usage of coal as fuel is provided, then it will be necessary to identify a suitable agency to monitor coal consumption beyond the stipulated 25 % limit. The agency will allot the required quantity to each Project based on its capacity and Ministry of Non-Conventional Energy Sources' guidelines. Based on this allotment, the Project holders approach the specified coal company for procurement of coal.

6.13 The Project holder shall submit a monthly Fuel Usage Statement of actual fuel quantity used during the month (with break-up of all fuels – biomass and fossil fuels) and cumulative quantity till the end of the month, to the concerned Licensee along with the monthly energy bill, with a copy to Monitoring agency for record, monitoring and verification purposes. Non-compliance of the same by a Project holder and also use of fossil fuel in excess of the specified percentage during any year shall result in withdrawal of all the benefits given to Biomass based power projects.

6.14 The Commission proposes that M.P.Urja Vikas Nigam Ltd., the State Nodal Agency for Madhya Pradesh, would be the appropriate agency to monitor the uses of coal by generators.

7. OPERATING PARAMETERS

Plant Load Factor

7.1 M.P Electricity Consumers' Society, Indore suggested that Plant Load Factor can't be more than 60 % because of following reasons:

a) Seasonal fuel supplies

b) Limited storage facilities

It further proposed to increase it after sufficient capacity addition & fuel supply management.

7.2 Shalivahana Group, Secunderabad proposed Plant Load Factor of 80% (330 Days) whereas Saurabh Power Generation Pvt. Ltd.(SPG) , Bhopal suggested that Plant Load Factor should be 60% and incentive above this Plant Load factor should be made available. Hema Sri Power Projects Ltd. Suryapet (A.P.) proposed 90% Plant Load Factor for biomass plants.

7.3 M.P.Urja Vikas Nigam Ltd. has stated that due to non- availability of fuel throughout the year, the Plant Load Factor of 80 % will be difficult to achieve. It proposed 70 % Plant Load Factor.

Commission's views

7.4 There seems a lot of variation in the Plant Load Factor proposed by petitioners, which is varying from 60% to 90 %. Most of the State Electricity Regulatory Commissions have taken it around 80 %.

7.5 As per the survey done by Madhya Pradesh Urja Vikas Nigam, mustard husk is having a potential of 100 MW of power generation. Looking to availability of biomass in the State and other factors, a Plant Load Factor of 70 % is considered appropriate by the Commission.

Auxiliary Consumption

7.6 Anant Spinning Mills proposed that auxiliary consumption shall be limited to 8%, whereas Shalivahana Group, Secunderabad (A.P.) limited it to 12.5 % and Hema Sri Power Projects Ltd. Suryapet (A.P) suggested 9%.

7.7 Central Electricity Authority has recommended an auxiliary consumption to be taken as 10%.

7.8 M.P. Urja Vikas Nigam Ltd. has also proposed auxiliary consumption of 10 %.

Commission's views

7.9 The auxiliary consumption is a function of its efficiency and the energy conservation methods adopted by the generators. The Commission considers the auxiliary consumption for the biomass power plants as 10 % based on recommendations of M.P.Urja Vikas Nigam Ltd. and the Central Electricity Authority.

Cost of Fuel

7.10 M.P. Electricity Consumers' Society, Indore suggested that at the present stage the cost of fuel can't be less than Rs 1800/ton. Consolidated Energy Consultants Limited, Bhopal said that the transportation of low density Biomass is quite costly. Logical assumption may be Rs. 1500/ ton.

7.11 Shalivahana Group, Secunderabad (A.P.) has proposed

a) Main Biomass 100% Rs. 950 /ton

b) Supplementary Biomass coal (25%) at Rs. 1500/ton. The average cost of fuel suggested is Rs. 1087.50/ton.

7.12 Hema Sri Power Projects Ltd., Suryapet (A.P.) proposed Rs. 1300-1500/ton because of processing costs related to bring down moisture level in raw bio-mass.

7.13 According to M.P.Urja Vikas Nigam Ltd., the cost of biomass at source is Rs. 900/tonne and including transportation cost, the landed cost at site comes out to be Rs. 1250/ tonne. It has suggested taking biomass (75%) & Coal (25%) as fuel for biomass power projects. The cost of Biomass is taken Rs. 1500/MT (including 2% transit loss, 10% moisture loss, 5% foreign matter) and cost of Grade C coal is taken as Rs. 2000/MT. The average cost proposed is Rs. 1625 / MT.

7.14 Recently, a consultation paper was prepared by Tata Energy Research Institute for Central Electricity Regulatory Commission on "Pricing of power from non-conventional sources", which suggests that the approach of linking the fuel cost with equivalent coal cost can be followed in States where there is limited experience of biomass power generation.

Commission's views

7.15 The fuel collection and transportation is largely in the un-organised sector and prices are influenced by local factors. In the given context fuel cost determination for biomass projects is a complex exercise as it depends upon the nature of fuel and its availability, combination of fuels used by different plants, location of the plants near to the fuel source, etc. The prices quoted by various agencies vary widely.

7.16 In the absence of any past trend of fuel prices, the Commission adopts to calculate price of fuel in equivalent heat terms. Considering the fact that most of the Projects would be based on a variety of biomass fuels with differing characteristics and calorific values, used in varying proportions, it would be appropriate to determine the biomass fuel price on an equivalent heat value basis.

7.17 For this purpose the Commission considers the cost of Coal for grade D & E as approved by the Commission for Generation Tariff for FY07 to FY09 based on the tariff application made by Madhya Pradesh Power Generating Company Limited (MPPGCL) under Multi Year Tariff Principles.

7.18 Two plants considered for cost calculation are ATPS Chachai & STPS Sarni. A premium of 5% on the cost of fuel (coal) for biomass generation is considered since the requirement is too small as compared to ATPS Chachai and STPS Sarni and they have to purchase coal from open market. The weighted average price of coal at these stations comes to Rs 1218 /MT which becomes Rs. 1279/MT after a premium of 5%.

7.19 Taking into account, use of 25% of coal and 50% and 25% uses of Biomass fuel A and B respectively, weighted average cost of fuel works out to Rs1181/MT as illustrated in the table below.

Station	Price (Rs./MT)		Weighted average Price (Rs./MT) if taken 50% of each grade
	Coal Grade "D"	Coal Grade "E"	
ATPS Chachai	1164.63	1066.02	1115.325
STPS Sarni	1455.11	1185.86	1320.485
Weighted average Price (Rs./MT)			1218
With 5% premium Price (Rs./MT)			1279
Gross calorific value of coal (Kcal./Kg.)			3600
Price in Heat terms (Rs. /K.Cal.)			0.000355

Fuel (1)	Calorific Value (Kcal./Kg.) (2)	Price (Rs./MT) $ (3)	Ratio (%) (4)	Weighted average of fuel Price (Rs./MT) (5=3*4/100)
Biomass "A"	3400	1207.75	50	604
Biomass "B"	2900	1030.15	25	257
Coal	3600	1278.80	25	320
Total Price (Rs./MT)				1181

$ = Price in heat terms (Rs./Kcal.) X calorific value (Kcal./Kg.) X 1000

Fuel Price Escalation

7.20 Shalivahana Group, Secunderabad (A.P.) has suggested an escalation of 10% on fuel prices.

7.21 M.P. Urja Vikas Nigam Ltd. has proposed an escalation of 4 % on average cost of fuel.

7.22 Appellate Tribunal for Electricity had stated in Chhatisgarh case that an escalation at 5% p.a. be provided.

Commission's views

7.23 The Commission considers the fuel cost escalation of 5% on compounded basis for future years as appropriate.

Fuel Consumption

The Commission considers it necessary to determine the gross calorific value and station heat rate for biomass generating units in order to calculate the fuel consumption:

Gross Calorific Value

7.24 Calorific value denotes the heat content of the fuel per kg. The calorific value would therefore, depend upon the fuel constituents to be used by the Biomass plant.

7.25 Central Electricity Authority has recommended a calorific value of 3300 Kcal/Kg for the fossil fuel to be used for Generation of electricity from biomass.

7.26 M.P. Urja Vikas Nigam Ltd. has suggested the calorific value for Biomass to be 3200kcal/kg and for coal to be 3400 kcal/kg. The average calorific value of the fuel proposed is 3250 kcal/kg.

Commission's views

7.27 MPERC expects that the developers of the State are likely to use Rice Husk, Soya Husk, Mustard Husk, Cotton stock, Ground Nut residue & Woody Biomass. The calorific value of these items of biomass is expected to be around 3325 Kcal/Kg.

7.28 The Commission proposes the following calorific value :

a)	Biomass Fuel A:	3400 kCal/kg), (50%) ----	1700 Kcal./Kg.
b)	Supplementary Biomass Fuel B:	2900 kCal/kg), (25%) ----	725 Kcal./Kg.
c)	Coal :	3600 kCal/kg), (25%) ----	900 Kcal./Kg.
			3325 Kcal./Kg.

Gross calorific value adopted by the Commission is, therefore, 3325 Kcal./Kg.

Station heat rate

7.29 The Station Heat Rate is another key performance parameter. The Station Heat Rate is dependent on plant capacity, plant design and configuration, technology (boiler type and pressure levels etc.), plant operation practices and maintenance philosophy adopted, quality of fuel received and operational performance over varying load conditions.

7.30 M.P.Urja Vikas Nigam Ltd. has proposed a station heat rate of 3700 kcal/kwh.

Commission's views

7.31 Central Electricity Authority has recommended that the plant heat rate of 4500 Kcal/Kwh may be considered. However considering the norms adopted by other Commissions and as proposed by M.P.Urja Vikas Nigam Ltd. station heat rate for tariff computation can be taken as 3600 Kcal/Kwh.

O & M expenditure

7.32 Shalivahana Group, Secunderabad (A.P.) suggested an O & M cost of 5 %.

7.33 The recommendation of Central Electricity Authority is to consider O&M expenses including insurance as 7% of capital cost whereas the Commission in its draft notification considered the O&M expenses for Biomass power plants as 4% of the capital cost with an escalation of 5 %.

7.34 M.P. Urja Vikas Nigam Ltd.has also proposed O&M as 4% with an escalation of 5 %.

Commission's views

7.35 Taking into consideration the various norms adopted by other State Electricity Regulatory Commissions and as proposed by M.P.Urja Vikas Nigam Ltd., the O&M expenses including insurance at 4% of the capital cost with an escalation of 5% on O&M expenses per annum can be considered for tariff determination of biomass based power project.

Working capital

7.36 The fuel storage requirement depends on factors such as type of fuel, its availability on a continuous basis round the year, the storage facilities available, procurement arrangements, the price during season / off-season, etc.

Commission's views

7.37 In view of seasonal variation in availability of fuel, the Commission has considered a higher working capital for fuel stock. The Commission has provided working capital for the biomass based power projects as stated below:

a) 3 months of fuel stock ,

b) 1 month of O& M cost and

c) 2 months of receivables.

8. FINANCIAL PARAMETERS

Interest on working capital

8.1 Shalivahana Group, Secunderabad (A.P.) has suggested interest on working capital to be 13%.

8.2 Benchmark Prime Lending Rate (referred to as State Bank Annualised Rate) is revised upwards by 50 basis points from 12.25% p.a. to 12.75% p.a. with effect from 9th April 2007.

8.3 The interest rate admissible for conventional thermal plants is equal to the short term Prime Lending Rate of State Bank of India as on 1st April of the relevant year plus 1%. The Commission in its tariff Order for M.P. Generating Company for FY07 to FY09 has considered a rate 11.25% for computing interest cost on working capital borrowings.

Commission's views

8.4 The Commission has considered the interest rate at State Bank of India Prime Lending Rate + 1%. For computation of present tariff, interest on working capital is taken at 13.75%. It will be reviewed if Prime Lending Rate varies by more than +_2 % in any financial year.

Depreciation

8.5 Shalivahana Group, Secunderabad (A.P.) has suggested depreciation of 5.28%

8.6 Central Electricity Authority has recommended depreciation at the rate of 7.84% p.a. until the debt is repaid. Beyond that 20% is to be spread over the remaining life of the plants.

Commission's views

8.7 The Commission is of the view that 90 % of the plant cost be depreciated during its life period. The depreciation rate is computed on a Straight Line Method wherein the asset historical value of 70 % is to be depreciated for first 10 yeaRs with a rate of 7 % p.a. Rest 20 % of asset historical value is depreciated over next 10 years on straight line method.

Return on equity

8.8 Shalivahana Group, Secunderabad (A.P.) has proposed 20% as return on equity.

8.9 M.P.Urja Vikas Nigam Ltd.has suggested 16 % as return on equity.

Commission's views

8.10 Central Electricity Regulatory Commission for conventional plants allows a return of 14%. Most of the Commissions have allowed higher returns to encourage investment in renewable sources and have given the freedom to investors to manage their tax liability within this allowed return. The Commission has allowed rate of return @ **16% pre-tax.**

Interest on Debt & loan

8.11 Shalivahana Group, Secunderabad (A.P.) has suggested 12 % whereas Hema Sri Power Projects Ltd. Suryapet (A.P.) has proposed interest and finance charges to 13%.

8.12 M.P.Urja Vikas Nigam Ltd. has proposed interest rate of 12 % on the long term debt for 10 years.

8.13 The present lending rate of Indian Renewable Energy Development Agency is 10.25% (interest to be computed quarterly) for a term loan for 10 years.

Commission's views

8.14 The Loans have been considered at an interest rate of 11 % on annual basis for 10 years duration.

Year of Operation

8.15 Year of operation shall be reckoned from the date of *commercial operation.*

Debt - Equity Ratio

8.16 Shalivahana Group, Secunderabad (A.P.) has suggested 70:30 ratio.

Commission's views

8.17 Debt-equity ratio is mainly determined by the Financial Institutions for approving project loans. As these projects are mainly financed by Financial Institutions and they insist on debt-equity ratio of 70: 30, a debt-equity ratio of 70: 30 is assumed.

9. COMMISSION'S ORDER: TARIFF RATE AND STRUCTURE

Determination of Tariff Rate and Structure

9.1 Considering the above parameters, the Commission sets the tariff for generation from 1 MW biomass based power plant to be commissioned after issue of this order for its project life of 20 years in the manner shown below :

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Tariff (Rs/unit)	3.33	3.36	3.39	3.43	3.48	3.53	3.59	3.65	3.71	3.79
	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Tariff (Rs/unit)	3.51	3.65	3.81	3.97	4.15	4.33	4.52	4.71	4.92	5.14

10. OTHER TERMS AND CONDITIONS

10.1 The Tariff Rate for the licensee is inclusive of all charges (tax liabilities included).

10.2 The Project holder shall be entitled to recover the above charges for generation up to a threshold Plant Load Factor level of 70%. For actual generation (excluding deemed generation) at Plant Load Factor of 75% or more calculated for the financial year, the Project holder shall be entitled to an additional incentive component at the rate of Rs. 0.25 per unit. The quantum due for payment as incentive charges shall be determined at the end of the financial year based on actual generation during that financial year.

10.3 An earlier review of the Tariff Rate before the control period of five years may be undertaken under exceptional circumstances, if the need for such review is clearly demonstrated with adequate supporting material.

10.4 The Tariff Rate and Structure shall be firm, and will not vary with fluctuation in exchange rate variations or on account of changes in law or in taxes.

Power Purchase Agreement Tenure

10.5 The Commission directs that the developer and the Distribution Licensee enter into a Power Purchase Agreement for a period of 20 years from the date of the Commissioning of the plant.

10.6 The Distribution Licensees are directed to prepare a model Power Purchase Agreement in this regard for exclusive sale of electricity to them and would be required to submit the same before the Commission within 30 days of the order for approval.

10.7 The developers are required to get all the required environmental and pollution control consents.

Scheduling

10.8 The power generation from biomass is not infirm in nature. The fuel availability and the power generation can be predicted and thus can be considered as capable of supplying firm power. However, the individual capacity of biomass generation is typically in the range of 5-20 MW, is comparatively much smaller than that of the conventional thermal or hydro power plants. Further, there could be a large number of such small capacity plants, which due to practical considerations cannot be brought under scheduling.

10.9 The Commission also keeps the generation from biomass resources out of the purview of 'merit order dispatch principles'.

Reactive Power Supply

10.10 The Biomass Generators would be deemed to be the generating station 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.

10.11 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, which may be revised from time to time as and when necessary.

10.12 Reactive energy charges would be adjusted in the bill of the developer for energy sold to the Distribution Licensees.

Wheeling charges

10.13 Wheeling charges and applicable surcharge on wheeling charges shall be levied as decided by the Commission from time to time for third party sale.

Metering & Billing

10.14 The metering arrangement to be done at site as per the provisions of the Government of M.P. incentive policy for encouraging generation of power in M.P. through Non-conventional Energy Sources notified on 17.10.06.

10.15 Billing of the metered energy to be carried out on a monthly basis.

10.16 State Load Dispatch Center shall be responsible for energy accounting if the point of injection is the substation of the Transmission Licensee or the transfer involves two or more Distribution Licensees. In other case the concerned Distribution Licensee would be responsible.

Payment Mechanism

10.17 The Commission prescribes that a settlement period of 30 days should be followed in order to ensure that the developer has an assurance of cash inflow for the energy, which he delivers to the grid.

10.18 In case of delay beyond the 30 days payment period, the utility will pay penal interest on outstanding amount at the rate of 2% p.a. 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 payment becomes due.

Default Provisions – Third Party Sale or sale to utility

10.19 In case of continuing default for more than three months by the distribution Licensee, the developer can sell power to the third party. In such cases, no wheeling charges would be paid for the network of the concerned Distribution Licensee but all other conditions of open access would be applicable. This condition of third party sale is being proposed to provide comfort to the investor in case the Distribution licensee defaults in paying the due amount.

10.20 Where the developer has an existing arrangement for third party supply or for captive consumption and in case the developer desires to terminate the agreement with third party and to supply to the utility, the utility with the prior permission of the Commission may purchase the power at the rate as would be determined by the Commission in which case the developers are required to execute the Power Purchase Agreement with the licensee for the remaining period of plant life of 20 years.

Drawing of Power during Shutdown

10.21 The plant would be entitled to draw power from the Distribution Licensee's network during shutdown period of its plant or during other emergencies. The energy consumed would be billed at the temporary rate applicable to HT Industrial category. The drawal by the Plant would not exceed 10% of the MW capacity it delivers to the Distribution licensee.

Other applicable conditions

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

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

Minimum Purchase Requirements

10.24 Section 86(1)(e) of the Electricity Act,2003 states that the State Commission shall specify a percentage of the total consumption of electricity in the area of a distribution licensee for purchase of electricity from renewable sources

10.25 The Commission, therefore, fixes a target of 10% of total annual consumption (including third party sale and own use) in the area of supply for all licensees, subject to availability, as the minimum purchase requirement from all Non-conventional Sources of Energy including Bio-mass, wind, small hydro, co-generation etc. for the distribution licensees. The inter-se allocation between the various non-conventional sources of energy will be specified by the Commission based on the installed capacity of each source in the course of annual retail tariff determination.

10.26 If the Distribution Licensee fulfils the minimum purchase requirements and still has offers from the renewable energy generators, then either the Distribution Licensee or the developers can approach the Commission for approval of such procurement offers. The Commission is presently not inclined to prescribe the maximum limit, as it does not foresee that in the immediate future, there would be offers from investors in renewable sources exceeding the prescribed minimum limit.

10.27 The condition of minimum purchase requirement for the Distribution Licensee would not be applicable under Force Majure Conditions such as war, strike, lockout, riots, act of God or natural calamity etc. so as to enable the Distribution Licensee to maintain the supply to its consumers and public services under emergency conditions.

Banking

10.28 Banking in respect of captive generator and third party suppliers shall be allowed in terms of provisions made in the Government of M.P. incentive policy for encouraging generation of power in M.P. through Non-conventional Energy Sources notified on 17.10.06. The distribution licensees are directed to submit a proposal to the Commission on the methodology of banking within three months from the date of the order.

Reduction in contract demand

10.29 Reduction in contract demand shall be allowed in terms of provisions made in the Government of M.P. incentive policy for encouraging generation of power in M.P. through Non-conventional Energy Sources notified on 17.10.06.

Tariff for existing biomass power projects

10.30 Existing projects are those, which have their date of commissioning before the date on which this current order comes into effect. These projects were set up under the guidelines existing at the time of such investments.

10.31 The price payable to this group of projects for sale to the licensees shall be Rs. 2.99 per unit. This tariff would remain constant for the remaining period of operation of the project considering the life of project as 20 years. However, wheeling charges as per provisions made in the incentive policy of the Government of Madhya Pradesh will be applicable to such sale.

Power to amend

10.32 The Commission reserves the right to alter, modify or amend any provisions of the order any time. The Commission feels that this provision is necessary so that any fact which has been over-looked or any new situation emerges due to experience gained during the operation of the order can be incorporated subsequently in the interest of all the stakeholders.

Ordered accordingly.

Sd/-	Sd/-	Sd/-
(R.Natarajan)	**(D.Roybardhan)**	**(Dr. J.L.Bose)**
Member(Econ.)	**Member(Engg.)**	**Chairman**

Place : Bhopal

Date : 7th August,2007