

SMP-45/2010

M.P. Electricity Regulatory Commission Bhopal



Tariff Order for Solar Energy Based Power Generation in Madhya Pradesh

JULY 2010

A1: BACKGROUND

- 1.1 In February 2004, MPERC had issued a discussion paper entitled “Approach Paper on Tariff-Setting and Support to Renewable Energy Sources”.
- 1.2 The above Approach Paper had noted that conventional electricity pricing does not take into account the costs corresponding to negative externalities such as pollution, depletion of resources, displacement of people, damage to fragile ecosystems, etc. In this regard, the Paper had emphasized the importance of investments in renewable energy.
- 1.3 Broadly, the Approach Paper had covered the following areas.
 - (a) Mechanisms to determine Minimum Purchase Requirements for the Licensees.
 - (b) Identification of issues that may arise as a result of increasing production from renewable sources.
 - (c) Mechanisms to supplement Minimum Purchase Requirements and address issues that arise as a result of increasing production from renewable sources.
 - (d) Suitable tariff for wind energy
- 1.4 Apart from countering the negative externalities inherent in fossil fuel based conventional power generation, it is also important to promote renewable for the purpose of augmenting overall power availability. The power supply position in Madhya Pradesh remains a matter of concern. Peak power as well as energy deficits are already significant and could to grow rapidly over future years unless substantial capacity addition takes place in short term.
- 1.5 Energy from the sun is the earliest source of energy known to the mankind, and is also the origin of other forms of energy used by man. Other renewable sources of energy, such as, wind, hydro power, biomass and ocean energy are the indirect forms of solar energy. Solar energy has many salient features, which make it an attractive proposition. These features include its wide-spread distribution, environment friendliness and virtually inexhaustible supply.
- 1.6 India receives solar energy equivalent to over 5000 trillion kWh/year, which is far more than the total energy consumption of the country. The daily average of incident solar energy in India ranges 4-7 kWh/m² depending upon the location. With the annual mean daily global solar radiation of 5.4 to 5.8 kWh/Sq.m/day, the state of Madhya Pradesh has ample solar energy based electricity generation potential.

A2: POLICY & LEGAL CONTEXT

2.1 Electricity Act, 2003

- 2.1.1. Sections 86(1) and 61(h) of the Electricity Act, 2003, provide the legal framework for the involvement of the Commission in renewable energy:

Section 86 (1) - *The State Commission shall discharge the following functions, namely: -*

(e) promote cogeneration 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 licence;

Section 61 - *The Appropriate Commission shall, subject to the provisions of this Act, specify the terms and conditions for the determination of tariff, and in doing so, shall be guided by the following, namely:-*

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

2.2 National Electricity Policy, Tariff Policy & National Action Plan on Climate Change

- 2.2.1. The National Electricity Policy (NEP), 2005 reasserts the Government's intent to promote renewable energy. Select extracts from the NEP are presented hereunder:

5.2.20 *“Feasible potential of non-conventional energy resources, mainly small hydro, wind and bio-mass would also need to be exploited fully to create additional power generation capacity. With a view to increase the overall share of non-conventional energy sources in the electricity mix, efforts will be made to encourage private sector participation through suitable promotional measures.”*

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 “... 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.”

2.2.2. The Tariff Policy (2006) also emphasizes the importance of the renewable energy generation and its subsequent benefits for the country. Some key extracts are presented below:

5.3 (i) “ Tariff fixation for all electricity projects (generation, transmission, and distribution) that results in lower Green House Gas emissions than the relevant base line should take into account the benefits obtained from the Clean Development Mechanism into consideration, in a manner so as to provide adequate incentive to the project developers.”

6.4 (1) “..... 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.....”

6.4 (2) “ Such procurement by Distribution Licensees for future requirement shall be done as far as possible through competitive bidding process under section 63 of the Act within the suppliers offering energy from same type of non conventional sources. ”

2.2.3. National Action Plan on Climate Change is the national strategy of India to achieve a sustainable development path that simultaneously advances economic and environmental objectives. The National Action Plan hinges on the development and use of new technologies. National Solar Mission is one of the eight national missions which form the core of the National Action Plan.

The objective of National Solar Mission is to significantly increase the share of solar energy in the total energy mix while recognizing the need to expand the scope of other renewable and non-fossil options.

2.3 Incentive Policy for encouraging generation of power through non-conventional energy sources

2.3.1. The Government of Madhya Pradesh issued this policy on 17.10.2006 to encourage generation of power from non-conventional energy sources in Madhya Pradesh. As per this policy, renewable energy projects will be entitled to get all benefits under Industrial Promotion Policy, 2004. Also, this policy provides incentives such as

exemption from open access charges, reduction in contract demand, and exemption of non-conventional energy equipment from commercial taxes, etc. to non-conventional power generation.

2.4 CERC Regulation on renewable energy sources

- 2.4.1. CERC issued Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2009 on 16th September 2009. Subsequently, an amendment to the above Regulations was issued on 25.2.2010 and following was inserted as clause(2);

“(2) Notwithstanding anything contained in these regulations,

the generic tariff determined for Solar PV projects based on the capital cost and other norms applicable for the year 2010-11 shall also apply for such projects during the year 2011-12; and

the generic tariff determined for Solar thermal projects based on the capital cost and other norms for the year 2010-11 shall also apply for such projects during the years 2011-12 and 2012-13,

provided that (i) the Power Purchase Agreements in respect of the Solar PV projects and Solar thermal projects as mentioned in this clause are signed on or before 31st March, 2011; and (ii) the entire capacity covered by the Power Purchase Agreements is commissioned on or before 31st March, 2012 in respect of Solar PV projects and on or before 31st March, 2013 in respect of Solar thermal projects.”

- 2.4.2. These Regulations apply to the projects, for which tariff is to be determined by the CERC under Section 62 read with Section 79 of the Act. However the Commission has considered these Regulations as a guideline in determination of solar tariff for the projects located in the State of Madhya Pradesh for which MPERC tariff is applicable.

2.5 National Solar Mission

- 2.5.1. The Government of India has issued a document on Jawaharlal Nehru National Solar Mission towards building SOLAR INDIA in November, 2009. The objective of the Solar Mission is to create conditions, through rapid scale-up of capacity and technological innovation to drive down costs so that solar generation achieves grid parity. The Mission anticipates achieving grid parity by 2022 and to ramp up capacity of grid-connected solar power generation to 1000 MW within three years—by 2013. The NTPC Vidyut Vyapar Nigam Limited (NVTN) is designated as nodal agency by Ministry of Power for entering into a Power Purchase Agreement with Solar Power Developers to purchase solar power fed to 33 kV and above grid in accordance with the tariff and PPA duration as fixed by the CERC. The Ministry of Power shall allocate to NVTN, equivalent megawatt capacity, from the Central unallocated quota, from NTPC power stations, at the rate notified by the CERC for bundling together with solar power. NVTN will undertake the sale of the bundled power to State

Utilities at the rates determined as per CERC Regulations. The above arrangement will be limited to utility scale Solar Power generated from a minimum anticipated capacity of 1000 MW in the first phase. When NVVN supplies bundled power to State utilities at the rates determined as per CERC regulations, those State utilities will be entitled to use the solar part of the bundled power for meeting their Renewable Purchase Obligations (RPO) under the Electricity Act, 2003.

2.5.2. Recently, the Ministry of New and Renewable Energy(MNRE) has proposed to launch a programme on generation based incentives hereinafter shall be referred to as “Rooftop PV & Small Solar Power Generation Programme”(RPSSGP). The key features of the programme are as under :-

- (a) There shall be two categories of projects
 - (i) connected at HT but below 33 kV with installed capacity of 100 kW and up to 2 MW.
 - (ii) connected at Low voltage up to 400 Volts with installed capacity lower than 100 kW.
- (b) Projects should be designed for completion before 31.3.2013.
- (c) Present guidelines are applicable to projects with installed capacity of 100 kW and up to 2 MW with grid connectivity at HT.
- (d) The Local distribution company shall sign a Power Purchase Agreement with the developer at a levelised tariff determined by the Commission for 25 years.
- (e) Generation based incentive will be payable to the Distribution Company for power purchased equal to the difference between that tariff determined by CERC and the base rate (Rs. 5.50 per unit for FY 2010-11 escalated by 3% every year.) The base rate shall remain constant over the project life of 25 years.

2.6 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 solar based generators in the State.

A3: REGULATORY PROCESS

3.1 The Commission had issued another discussion paper on 26.11.2008 titled “Determination of Tariff for Solar Energy Based Power Projects in Madhya Pradesh” inviting comments/suggestions from all stakeholders by 11.01.2009. Since this was much before the inception of Jawaharlal Nehru National Solar Mission, therefore, the guidelines issued by MNRE under Solar Mission could not be made a part of the discussion paper . In response to the above, comments from following stakeholders were received:

- (a) M.P. Electricity Consumers Society, Indore
- (b) Acme Tele Power Limited, Gurgaon
- (c) M.P. Power Transmission Company Limited, Jabalpur
- (d) M.P. Power Trading Company Limited, Jabalpur

3.2 A public hearing was held on 19.02.2009. The representatives of all the above stakeholders attended the hearing and offered their comments/suggestions on the norms specified in the discussion paper. As CERC came out with draft Regulations at the time of public hearing, the Commission awaited for final regulations of CERC in the matter of determination of solar tariff, which was issued on 16.9.2009. Apart from this, tariff orders have also been issued by other State Electricity Regulatory Commissions. The field of solar generation is in an evolutionary stage. The Commission, therefore, attempted to collate available information to come up with a sustainable tariff.

3.3 The Commission has kept in view the tariff orders issued by other State Electricity Regulatory Commissions, comments/suggestions from various stakeholders, data on solar energy based power generation from various sources, and guidelines for determination of tariff for procurement of power from renewable energy sources. The Commission has also referred the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2009 issued on 16th September 2009 and guidelines for Rooftop and other small power plants connected to distribution network (below 33 kV) as guidelines in finalization of solar tariff. Accordingly, the Commission issues the following order to meet the requirements of the Electricity Act, 2003.

A4: APPLICABILITY OF THE ORDER

4.1. The tariff determined by the Commission in this order shall be applicable to the following Projects located in the State of Madhya Pradesh and selling electricity to the distribution licensees within Madhya Pradesh only:--

- (a) Solar PV Power Plants for which Power Purchase Agreements are signed by 31.3.2011 and the projects are commissioned by 31.3.2012.
 - (b) Solar Thermal Power Plants for which Power Purchase Agreements are signed by 31.3.2011 and the projects are commissioned by 31.3.2013.
 - (c) Rooftop and other small Solar Power Plants of capacity up to 2MW connected to distribution network (below 33 kV) for which Power Purchase Agreements are signed by 31.3.2011 and the projects are commissioned by 31.3.2013.
- 4.2. It shall be 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 solar power generation projects commissioned in their licensed area, and also post the same on their websites on a regular basis.
- 4.3. For the purpose of this tariff order, unless the context otherwise requires;
- (a) 'Control Period' means the period during which the norms for determination of tariff specified in this Order shall remain valid;
 - (b) 'Hybrid Solar Thermal Power Plant' means the solar thermal power plant that uses other forms of energy input sources alongwith solar thermal energy for electricity generation, and wherein not less than 75% of electricity is generated from solar energy component.
 - (c) 'Inter-connection Point' shall mean interface point of renewable energy generating facility with the transmission system or distribution system, as the case may be, in relation to Solar Photovoltaic Projects shall be line isolator on outgoing feeder on HV side of the pooling sub-station and in relation to Solar Thermal Power it shall be line isolator on outgoing feeder on HV side of generator transformer;
 - (d) 'MNRE' means the Ministry of New and Renewable Energy of the Government of India.
 - (e) 'Solar PV power' means the Solar Photo Voltaic power project that uses sunlight for direct conversion into electricity through Photo Voltaic technology.
 - (f) 'Solar Thermal power' means the Solar Thermal power project that uses sunlight for direct conversion into electricity through Concentrated Solar Power technology based on either line focus or point focus principle.
 - (g) 'Tariff period' means the period for which tariff is to be determined by the Commission on the basis of norms specified in this Order.

(h) 'Useful Life' in relation to a unit of a generating station including evacuation system shall mean the duration for which it remains functional from the date of commercial operation (COD) of such generation facility.

- 4.4. Save as aforesaid words and expressions used in this Order and not defined, but defined in the Act, or the Code or Regulations of MPERC shall have the meanings assigned to them respectively in the Act or the Code or the Regulations of MPERC.

A5: CONTROL PERIOD AND TARIFF PERIOD

- 5.1 The Control Period will start from the date of issue of this order and will end on **31.03.2011**. The tariff determined in this order shall apply to all projects as mentioned in clause 4.1 of this order and the tariff determined shall remain valid for the project life of **25 years** from the date of commissioning.

- 5.2 Project specific tariff, on case to case basis, shall be determined by the Commission for the project, if a project developer opts for project specific tariff:

Provided that the Commission, while determining the project specific tariff for Solar PV and Solar Thermal, shall be guided by the principles laid down in this Order and such terms and conditions as stipulated under relevant Regulations or Orders of the Commission.

A6: APPROACH FOR TARIFF DETERMINATION

- 6.1 Tariff determination generally requires evaluation, detailed scrutiny and determination of each cost parameter for each Project separately. There are likely to be considerable diversity in the value of parameters across the Projects, such as in respect of plant capacity, location, project cost, financing plan etc. In absence of availability of such extensive data in Madhya Pradesh, the Commission has considered the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2009.

- 6.2 Since solar power is not amenable to merit order dispatch principles because of infirm nature and almost all the costs of solar power generators are fixed in nature, single part tariff appears best suited for the solar power generators and the same has been adopted.

- 6.3 A generalized tariff mechanism would provide an incentive to the investors for use of most efficient equipment and technology 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 decided to use one single part tariff for all the solar power projects using common benchmark technique, subject to provisions of clause 5.2.

6.4 Tariff Design:

6.4.1 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 Solar Power. In a cost plus approach, the key elements that influence the determination of tariffs for a project are mentioned below:

- (a) Capital Cost;
- (b) Debt Equity ratio;
- (c) Return on equity;
- (d) Interest on loan capital;
- (e) Depreciation and Useful plant life;
- (f) Operation and maintenance expenses;
- (g) Interest on working capital;
- (h) Capacity Utilization Factor(CUF);

6.5 Overview of Solar Thermal Power Technology

6.5.1 The Solar Parabolic Trough Technology and Power Tower Technology are considered by the Commission as given in the following clauses. However the Commission has determined the tariff for solar thermal as a whole considering CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2009.

6.5.2 Parabolic Trough Technology:

- (a) This technology is used to design power generation systems in a power range of up to 150MW. Solar Thermal Power Plants using this technology consist of large field of single-axis tracking parabolic trough solar collectors. Each solar collector has a linear parabolic shaped reflector that focuses the solar radiation on a linear receiver located at the focus of the parabola. The collectors track the sun during the day to ensure that the sun is continuously focussed on the linear receiver. A heat transfer fluid (HTF) is heated as it circulates through the receiver and returns to a series of heat exchangers in the power generation block, where the fluid is used to generate high pressure super heated steam. The super heated steam is then

fed to a steam turbine to generate electricity. The exhaust steam from the turbine is condensed in a condenser and returned to heat exchangers to be transformed back into steam. After passing through the heat exchangers, the cooled HTF is re-circulated through the solar field to be reheated. Parabolic troughs operate at temperatures ranging from 100⁰ C-400⁰C.

- (b) This technology is the most mature Concentrated Solar Power (CSP) technology and systems utilising this technology give the highest efficiency among CSP technologies.

6.5.3 Power Tower Technology:

- (a) Power generation plants utilizing this technology generate electricity by focussing concentrated solar radiation on a tower-mounted heat exchanger. This system uses several sun tracking mirrors called heliostats to reflect the incident sunlight onto the receiver. The high energy at the receiver due to concentrated sunlight is transferred to a substance like liquid sodium that can store the heat for later use. That energy can be used to generate steam to produce electricity by running steam turbines. These plants are best suited for utility scale applications of up to 400MW range.
- (b) The presence of thermal storage capability makes this technology unique among solar technologies by promising dispatch able power at load factors of up to 65%.

6.6 Tariff Design for Solar Thermal Power Generation Plants

6.6.1 Capital cost:

- (a) The 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 charges. The Commission had proposed Rs. 15 Crore/MW and Rs. 16 Crore/MW for Solar trough and solar tower plants respectively. The views of various stakeholders regarding capital cost of solar thermal power plants are:
 - (i) Acme Tele Power Limited, Gurgaon stated that the capital cost per MW for solar thermal power plants of capacity 5 MW (the maximum capacity that a developer can set up in the country) may be 20% higher than that of solar thermal power plants of higher capacity due to lower efficiency of smaller turbines.
 - (ii) M.P. Power Transmission Company Limited, Jabalpur stated that the grid interconnection cost for grid interactive solar power projects should be borne by the developer (as per Govt. of M.P. incentive policy for power generation from non-conventional energy sources) and hence project cost considered by the Commission for determination of tariff should include the grid interconnection cost.

- (iii) M.P. Power Trading Company Limited, Jabalpur stated that capital cost of Rs. 12 Crore per MW for solar tower plant (previously proposed by ACME Tele Power Limited) should be considered by the Commission to determine tariff.
- (b) The CERC in their Regulations dated 16.09.2009 with subsequent first amendment dated 25.2.2010 mentioned in clause 2.4.1 of this order has adopted Capital Cost of Rs. 13 Crores/MW up to FY 2011-12 . RERC has taken Rs. 14 Cr/MW as Capital Cost whereas GERC has taken Rs. 13 Cr/MW.
- (c) 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 has to be an integral part of the project and all expenses for power evacuation facility shall be borne by the developer.

Commission's decision:

The Commission takes note of the input given by Acme Tele Power Limited and observes that the capital cost proposed in the discussion paper is higher than that suggested by Acme Tele Power Limited. Hence the Commission is of the view that the capital cost of Rs. 13.0 Cr/MW is reasonable for solar thermal power plants. However, to fund power evacuation cost which is to be borne by the project developer as per Government of Madhya Pradesh policy, an additional Rs. 0.25 Cr. Per MW is being allowed. The Commission decides not to differentiate between Solar trough and Solar tower plants and determines the tariff for solar thermal projects with the capital cost of Rs. 13.25 Crore/MW.

- 6.6.2 Useful Plant life:** The Commission had proposed plant life as 20 years in its discussion paper. Various stakeholders have suggested plant life of 25 years. The CERC in its Regulations dated 16.09.2009 have also taken plant life as 25 years. Some other SERCs have also taken plant life as 25 years.

Commission's decision:

It may be mentioned that useful plant life of a coal based thermal generating station is considered as 25 years. Considering the fact that Solar Power Plants are not being subjected to as onerous operating conditions as thermal power plants, it is, therefore, appropriate to adopt plant life at least equal to that of coal based thermal plants. The Commission has, therefore, considered the plant life as 25 years for both solar trough and solar tower power plants for tariff determination.

- 6.6.3 Return on Equity:** The Commission had proposed return on equity as 16% pre-tax in its discussion paper. M/s Acme Tele Power Limited have asked for 15.50% post-tax return on equity for calculation of tariff. The CERC in its Regulations dated 16.9.2009 recommended return on equity as 19 % for the first 10 years and 24% for the next 15 years.

Commission's decision:

The Commission has allowed RoE of 15.5% pre-tax for thermal and hydro generating plants for the tariff period 2009-10 to 2011-12. This could undergo change at the time of determination of tariff for subsequent tariff periods. Keeping in view the requirements of the tariff policy for preferential tariff for renewable sources of energy and also after considering the views expressed by various stakeholders, the Commission has decided to allow RoE @ 16% pre-tax.

- 6.6.4 Capacity Utilization Factor:** The Capacity Utilization Factor (CUF) depends on several factors such as location of the project, quality and capacity and type of panels installed, technology adopted, conversion efficiency etc. The Commission in its discussion paper had proposed 22-24% as CUF. M/s Acme Tele Power Limited submitted that in the absence of heat storage, both trough and tower technology would have the same CUF of 24.00%. As per CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2009, the CUF shall be 23 %. RERC has taken CUF of 24% with deration of 0.25% each year after 4 years. GERC has taken CUF of 25%.

Commission's decision:

As the Capacity Utilization Factor depends on various variable factors, it would be difficult to compute it specifically for each project at each site. In view of this and after duly considering the stakeholders' views during the public hearing as well as the provisions in CERC/other ERCs, the Commission has considered adopting capacity utilization factor of 23% with derating @ 0.5% of CUF(23%) each year after two years of operation for tariff determination.

- 6.6.5 Depreciation:** The Commission in its discussion paper had proposed depreciation @ 7% per annum for the first 10 years and remaining 20% to be spread over the balance life of the plant of 10 years from 11th year onwards. Various stakeholders have also suggested depreciation @ 7% per annum for the first 10 years and balance 20% in next 15 years. The CERC recommendations are also the same.

Commission's decision:

In order to facilitate repayment of debt by project developers and considering loan repayment period of 10 years (no moratorium period), the Commission decides to provide depreciation rate of 7.00% for the first ten years of plant life with the rest of the asset value being depreciated equally during the rest of the plant life of 15 years. The Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.

- 6.6.6 O&M expenses:** The operation and maintenance expenses comprise of manpower expenses, insurance expenses, spares and repairs, consumables and other expenses (statutory fees etc.). Normally, the maintenance of Solar Power Plants results in a lower amount of manpower expenses as well as administrative and general expenses.

The Commission had proposed operation and maintenance expenses as 1.2% of Capital Cost for the first year and thereafter an escalation of 5.00 % per year in its discussion paper. Various stakeholders have suggested operation and maintenance expenses within the range of 1 % to 2 % with an escalation ranging from 5% to 6% per year.

The CERC in its Regulations dated 16.09.2009 has suggested O&M expenses as 13 lacs per MW for 1st year operation with escalation @ 5.72% per annum. GERC has provided 1 % O&M expenses with 5% per annum escalation and 0.3 % insurance charges on depreciated value. RERC has provided O&M expenses as Rs. 15 lakh in first year with 5.72% escalation and 0.3 % insurance on depreciated value of assets.

Commission's decision:

Considering views of the stakeholders and recommendations of CERC and tariff orders of other ERCs, the Commission has decided that it would be appropriate to allow 1 % of the capital cost of the project as O&M expenses in the first year with an escalation of 5.72% for each year thereafter. Insurance charges of 0.3% on depreciated value of assets is also allowed additionally.

6.6.7 Interest on Debt: The Commission had proposed interest on debt @ 10.50% p.a. in its discussion paper. Various stakeholders have suggested annual rate of interest on debt ranging from 12.25% to 14.29% or as per CERC recommendations. The CERC in its Regulations dated 16.09.2009 have recommended interest on debt at Long Term Prime Lending Rate of SBI plus 150 basis points.

Commission's decision:

The Commission considers that the interest rates for both deposit and loans are changing from time to time frequently. The Commission therefore, considers the annual interest rate on debt at 12.75% for tariff determination purposes. The investor is allowed to retain benefits, if any, by taking a cheaper loan.

6.6.8 Debt-Equity Ratio: The Commission had proposed debt-equity ratio of 70:30 in its discussion paper. Various stakeholders have also suggested 70:30 ratio. The Clause 5.3(b) of the Tariff Policy also stipulates a debt-equity ratio of 70:30 for financing power projects.

Commission's decision:

The Commission has, therefore, considered a debt-equity ratio of 70: 30.

6.6.9 Interest on working capital: The Commission in its discussion paper has provided 13.75% towards interest on working capital. The CERC in its Regulations dated 16.09.2009 has recommended interest on working capital at the rate of Short Term Prime Lending Rate of SBI plus 100 points 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.

Various stakeholders have suggested interest on working capital as proposed by CERC.

Commission's decision:

The Commission, after considering suggestions of various stakeholders including Licensees, decided that the amount of working capital shall be calculated adopting the following norms and interest thereon shall be calculated by using a simple rate of 13.25% per annum:

- a) O&M expenses for one month
- b) Receivables equivalent to two months of energy charges based on normative CUF.
- c) Maintenance spares @ 15% of O&M expenses

6.6.10 Auxiliary Consumption: The Commission in its discussion paper has provided auxiliary consumption at the rate of 10%. The CERC in its Regulations dated 16.09.2009 has also recommended the same. Various stakeholders have also suggested the same rate. RERC has allowed auxiliary consumption as 6.5 % noting that such activities as coal handling, coal crushing, ash disposal etc. necessary in coal plants are not required in these plants. GERC has allowed 10% auxiliary consumption.

Commission's decision:

The Commission concurs with the view expressed in RERC order that auxiliary consumption in these plants should be much lower than conventional coal based plants and hence allows 6.5 % auxiliary consumption.

6.6.11 Discounting Rate: In pursuance of clause 5.6 (vi) of Ministry of Power Notification dated 19.01.2005 (as amended from time to time) on Guidelines for determination of tariff by bidding process, the CERC notifies every half yearly the discounting rate to be used for the purpose of bid evaluation. This discounting rate is, however, not used for payment purpose. The Commission has looked into the discounting rate notified by the CERC for three years and finds that the discounting rate was 10.49% for 2008-09, 10.19% for 2009-10 and 9.35% for 2010-11. The Commission has, therefore, used discounting rate of 10.01% being the average of three years for the purpose of calculation of levelised tariff.

6.7 The summary of various parameters considered by the Commission to determine tariff for solar thermal power generation are:

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Parameters	Solar Thermal
Project Life	25 Years
Debt-Equity Ratio	70:30
Project Cost (Rs. Cr per MW)	13.25
Pre-tax return on equity	16%
Interest on debt	12.75%
Working capital	<p>a) Operation & Maintenance expenses for one month;</p> <p>b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;</p> <p>c) Maintenance spare @ 15% of operation and maintenance expenses</p>
Interest on working capital	13.25%
Salvage value (% of asset value)	10.00%
Depreciation (% of project cost per annum)	<p>7.00% (for first 10 years)</p> <p>1.333% (for 11-25 years)</p>
O&M Cost (% of project cost)	1% for 1 st year of operation escalated at the rate of 5.72% p.a. from 2 nd year onwards plus 0.3% of value of depreciated assets as insurance charges
Capacity Utilization Factor (CUF)	23% derated at the rate of 0.5% of CUF each year from 3rd year onwards.
Auxiliary Consumption	6.5 %

6.8 Determination of Tariff for Solar Thermal Generation Plants

- 6.8.1** The Commission determines the levelised tariff of **Rs. 11.26 per unit** for 25 years for sale of electricity from Solar Thermal Power Generation Plants taking discounting factor @ 10.01%.
- 6.8.2** The Commission intends to prescribe a separate minimum purchase obligation for Solar Based Generation. Notwithstanding the Commission's recommendations in clause 6.15.1, the tariff determined by the Commission shall be applicable to the extent of minimum purchase requirement fixed by the Commission.

6.9 Overview of Solar Photovoltaic Technology

- 6.9.1** In this technology, sunlight is directly converted into electricity with the help of photovoltaic cells. These cells are made up of a variety of materials like monocrystalline silicon, polycrystalline silicon, amorphous silicon, Cadmium telluride (CdTe), Copper Indium/Gallium Selenide (CIGS) etc. These materials are used to prepare photo-diodes which produce electricity (due to photovoltaic effect) in presence of sun light. These photo-diodes are called solar cells. Several solar cells are electrically connected and encapsulated as a module. These modules are used for generating electricity using solar power.
- 6.9.2** The electricity generated from Solar Photovoltaic modules is direct current (DC). Inverters are used to convert direct current into alternating current (AC).

6.10 Tariff Design for Solar Photovoltaic Power Generation Plants with capacity more than 2 MW

The Commission did not receive any suggestions/comments from stakeholders regarding either the parameters or the tariff proposed for solar PV based power generation in the discussion paper. However, the Commission has looked into the parameters given in the CERC's guidelines as well as those adopted by some of the SERCs and decided to adopt the parameters as discussed below:-

6.10.1 Capital cost:

- (a) The 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 charges. The Commission had proposed Rs. 20 Crore/MW for Solar Photovoltaic Power Generating Plant.
- (b) The CERC in their Regulations dated 16.09.2009 with subsequent first amendment dated 25.2.2010 have adopted Capital Cost of Rs. 17 Crores/MW up to FY 2011-12 as mentioned in clause 2.7 of this order. RERC has allowed a capital cost of Rs. 16 Cr. Per MW whereas GERC has allowed a capital cost of Rs. 16.50 Cr. Per MW.

- (c) 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 has to be an integral part of the project and all expenses for power evacuation facility shall be borne by the developer.

Commission's decision:

The Commission observes that the capital cost proposed in the discussion paper was higher than that recommended by CERC in its Regulations, 2009 and subsequent amendment dated 25.2.2010 as also that accepted by other State Electricity Regulatory Commission. Hence, the Commission is of the considered view that the capital cost may be considered as per CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2009. However, to fund power evacuation cost, an additional Rs. 0.25 Cr. Per MW is being allowed. The Commission, therefore, determines the tariff for solar PV Generating Projects taking the capital cost of Rs. 17.25 Crore/MW.

- 6.10.2 Useful Plant life:** The Commission had proposed plant life as 20 years in its discussion paper. The CERC in its Regulations dated 16.09.2009 have taken plant life as 25 years. RERC and GERC have also taken plant life as 25 years.

Commission's decision:

It may be mentioned that useful plant life of a coal based thermal generating station is considered as 25 years. Considering the fact that Solar Power Plants are not being subjected to as onerous operating conditions as thermal power plants, it is, therefore, appropriate to adopt plant life at least equal to that of coal based thermal plants. The Commission has, therefore, considered the plant life as 25 years for Solar PV Generating plants for tariff determination.

- 6.10.3 Return on Equity:** The Commission had proposed return on equity as 16% pre-tax in its discussion paper. The CERC in its Regulations dated 16.9.2009 recommended return on equity as 19 % for the first 10 years and 24% for the next 15 years.

Commission's decision:

The Commission has allowed RoE of 15.5% pre-tax for thermal and hydro generating plants for the tariff period 2009-10 to 2011-12. This could undergo change at the time of determination of tariff for subsequent tariff periods. Keeping in view the requirements of the tariff policy for preferential tariff for renewable sources of energy, the Commission has decided to allow RoE @ 16% pre-tax.

6.10.4 Capacity Utilization Factor: The Capacity Utilization Factor (CUF) depends on several factors such as location of the project, quality, capacity and type of panels installed, technology adopted, conversion efficiency etc. The Commission in its discussion paper had proposed 20% with derating factor @1% per annum as CUF. As per CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2009, the CUF shall be 19 %. RERC has accepted CUF as 20.50% with deration of 0.50% every year after two years of operations. GERC has accepted a CUF of 20 %.

Commission's decision:

As the Capacity Utilization Factor depends on various variable factors, it would be difficult to compute it specifically for each project at each site. In view of this and considering provisions made by CERC and other State Electricity Regulatory Commissions, the Commission has considered adopting capacity utilization factor of 20% with derating @ 1% of CUF per annum after two years of operations for working out tariff.

6.10.5 Depreciation: The Commission in its discussion paper had proposed depreciation @ 7% per annum for the first 10 years and remaining 20% to be spread over the balance life of the plant of 10 years from 11th year onwards. The CERC in its Regulations, 2009 has recommended depreciation rate of 7.00% for the first ten years of plant life with the rest of the asset value i.e. 20% being depreciated equally during the rest of the plant life of 15 years after considering 10% salvage value.

Commission's decision:

In order to facilitate repayment of debt by project developers and considering loan repayment period of 10 years (no moratorium period), the Commission decides to provide depreciation rate of 7.00% for the first ten years of plant life with the rest of the asset value being depreciated equally during the rest of the plant life of 15 years. The Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset.

6.10.6 O&M expenses: The operation and maintenance expenses comprise of manpower expenses, insurance expenses, spares and repairs, consumables and other expenses (statutory fees etc.). Normally, the maintenance of Solar Power Plants results in a lower amount of manpower expenses as well as administrative and general expenses.

The Commission had proposed operation and maintenance expenses as 0.2% of Capital Cost for the first year and thereafter an escalation of 5.00 % per year in its discussion paper.

The CERC in its Regulations dated 16.09.2009 has suggested O&M expenses as 9 lacs per MW for 1st year operation with escalation @ 5.72% per annum. GERC has provided 0.5 % O&M expenses with 5% per annum escalation and 0.35 % insurance charges on depreciated value. RERC has provided O&M expenses as Rs. 9.5 lakh in first year with 5.72% escalation and 0.3 % insurance on depreciated value of assets.

Commission's decision:

Considering recommendations of CERC and provisions by other State Electricity Regulatory Commissions, the Commission has decided that it would be appropriate to allow 0.5 % of the capital cost of the project as O&M expenses in the first year with an escalation of 5.72% for each year thereafter and 0.3% of depreciated cost of assets as insurance charges.

6.10.7 Interest on Debt: The Commission had proposed interest on debt @ 10.50% p.a. in its discussion paper. The CERC in its Regulations dated 16.09.2009 have recommended interest on debt at Long Term Prime Lending Rate of SBI plus 150 basis points.

Commission's decision:

The Commission considers that the interest rates for both deposit and loans are changing from time to time frequently. The Commission therefore, considers the annual interest rate on debt at 12.75% for tariff determination purposes. The investor is allowed to retain benefits, if any, by taking a cheaper loan.

6.10.8 Debt-Equity Ratio: The Commission had proposed debt-equity ratio of 70:30 in its discussion paper. The Clause 5.3(b) of the Tariff Policy also stipulates a debt-equity ratio of 70:30 for financing power projects.

Commission's decision:

The Commission has, therefore, considered a debt-equity ratio of 70: 30.

6.10.9 Interest on working capital: The Commission in its discussion paper has provided 13.75% per annum towards interest on working capital. The CERC in its Regulations dated 16.09.2009 has recommended interest on working capital at the rate of Short Term Prime Lending Rate of SBI plus 100 points 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.

Commission's decision:

The Commission, after considering the recommendations of CERC vide its Regulations, 2009, decided that the amount of working capital shall be calculated adopting the following norms and interest thereon shall be calculated by using a simple rate of 13.25% per annum:

- (a) O&M expenses for one month
- (b) Receivables equivalent to 2 months of energy charges based on normative CUF.
- (c) Maintenance spares @ 15% of O&M expenses

6.10.10 Auxiliary Consumption: The CERC in its Regulations dated 16.09.2009 has not recommended for auxiliary consumption. RERC has allowed auxiliary consumption as 0.25 %. GERC has not allowed auxiliary consumption.

Commission's decision:

The Commission is of the view that some equipments in the plant shall require supply to be consumed and also to promote these technologies, an auxiliary consumption of 0.25 % is allowed.

6.10.11 Discounting Rate: In pursuance of clause 5.6 (vi) of Ministry of Power Notification dated 19.01.2005 (as amended from time to time) on Guidelines for determination of tariff by bidding process, the CERC notifies every half yearly the discounting rate to be used for the purpose of bid evaluation. This discounting rate is, however, not used for payment purpose. The Commission has looked into the discounting rate notified by the CERC for three years and finds that the discounting rate was 10.49% for 2008-09, 10.19% for 2009-10 and 9.35% for 2010-11. The Commission has, therefore, used discounting rate of 10.01% being the average of three years for the purpose of calculation of levelised tariff.

6.11 The summary of various parameters considered by the Commission to determine tariff for Solar PV based power generation with project capacity of more than 2 MW are :

Parameters	Considered by MPERC
Project Life	25 years
Debt: Equity	70:30
Capital Cost (Rs. Crore per MW)	17.25
Pre-tax return on equity	16%
Interest on debt	12.75% p.a.
Working capital	<p>a) Operation & Maintenance expenses for one month;</p> <p>b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;</p> <p>c) Maintenance spare @ 15% of operation and maintenance expenses</p>
Interest on working capital	13.25% p.a.
Depreciation (% of project cost per annum)	<p>7 % (for 1-10 years)</p> <p>1.333% (for 11-25 years)</p>
O&M Cost (% of project cost)	0.5% for 1 st year of operation escalated at the rate of 5.72% p.a. from 2 nd year onwards plus 0.3% of value of depreciated assets as insurance charges
Capacity Utilization Factor (Clear sunny days 320 days)	20% derated at the rate of 1% of CUF each year from 3rd year onwards.
Auxiliary Consumption	0.25%

6.12 Determination of Tariff for Solar Photovoltaic Power Generation Plants

- 6.12.1** The Commission determines the levelised tariff of **Rs. 15.35 per unit** for 25 years for sale of electricity from Solar Photovoltaic Power Generation Plants of more than 2 MW capacity.
- 6.12.2** The Commission intends to prescribe a separate minimum purchase obligation for Solar Based Generation. Notwithstanding the Commission's recommendations in clause 6.15.1, the tariff determined by the Commission shall be applicable to the extent of minimum purchase requirement fixed by the Commission.

6.13 Tariff Design and Determination of Tariff for Rooftop PV and other small Solar Power Plants with capacity up to 2 MW

Various parameters adopted by the Commission for the purpose of tariff determination are discussed below:

6.13.1 Capital cost:

- (a) In case of Rooftop PV, cost of land, water facilities, land development, roads, security, illumination, civil structures, initial infrastructure for supply etc. will not be needed, which would result in lower costs in upfront investment. The modules can be installed on the public buildings and on private buildings. However, being a smaller capacity project, the overall cost is expected to be more on per MW basis.
- (b) The CERC in their draft Tariff Guidelines dated 9.6.2010 have adopted Capital Cost of Rs. 17.40 Crores/MW for 2010-11 for projects with a capacity limit up to 1 MW provided that the generic tariff determined based on capital cost and other norms applicable for the year 2010-11 shall also apply for such projects during the year 2011-12 subject to the conditions that the Power Purchase Agreement (PPA) in respect of such solar projects are signed on or before 31.3.2011 and entire capacity covered by PPAs is commissioned on or before 31.3.2012.

Commission's decision:

The Commission is of the view that the capital cost may be considered as per CERC draft guidelines dated 9.6.2010. The Commission, therefore, determines the tariff for Rooftop PV and other small Solar Power Projects with the capital cost of Rs. 17.40 Crore/MW.

6.13.2 Other parameters:

For other parameters like O&M expenses, CUF, Interest cost, depreciation etc., the Commission feels it appropriate to consider similar norms as applicable to the Solar PV Power Generation Projects.

6.14 Determination of Tariff :

6.14.1 The Commission determines the levelised tariff of **Rs. 15.49 per unit** for 25 years for sale of electricity from Rooftop PV and other small Solar Power Projects with capacity limited to 2 MW covered in MNRE's "Rooftop PV & Small Solar Power Generation Programme(RPSSGP)".

6.15 Determination of Tariff for the solar power projects not covered under MNRE scheme issued in March, 2008:

6.15.1 The views of stakeholders regarding solar power projects not covered under the above MNRE scheme are:

- (a) M.P. Electricity Consumer's Society stated that tariff should be issued for solar thermal power projects of size less than 1 MW and projects which do not come under the above scheme.
- (b) Acme Tele Power Limited too has stated that tariff determination process similar to that adopted for wind; biomass etc. projects may be considered for determining tariff for projects which are not covered under the above scheme.

Commission's decision:

The Commission is of the view that power procurement from such solar power projects, which are not covered under MNRE scheme issued in March, 2008, may be very costly. However, considering that there is a large potential in the State of Madhya Pradesh for solar power, the Government of Madhya Pradesh may consider providing subsidy / incentives for power generation from such plants so that the cost payable by the licensee is reasonable.

6.16 Summary of Solar Power Tariff:

The generic tariff levelised for 25 years for different technologies (Solar PV & Solar Thermal) and for Rooftop and other small Solar Power Plant is determined as under :-

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S.No.	Particulars	Tariff (Rs./unit)
1.	Solar PV Power Plants for which Power Purchase Agreements are signed by 31.3.2011 and the projects are commissioned by 31.3.2012.	15.35
2.	Solar Thermal Power Plants for which Power Purchase Agreements are signed by 31.3.2011 and the projects are commissioned by 31.3.2013.	11.26
3.	Rooftop and other small Solar Power Plants of capacity up to 2MW connected to distribution network (below 33 kV) for which Power Purchase Agreements are signed by 31.3.2011 and the projects are commissioned by 31.3.2013.	15.49

Note:-- Projects availing benefits of accelerated depreciation, the tariff as determined above shall be reduced as provided in clause 7.4.

A7: OTHER ISSUES

7.1 Bidding for Power Procurement

The tariff indicated above is the maximum tariff and the state nodal agency, M.P. Urja Vikas Nigam Limited or M.P. Power Trading Co. on behalf of the Distribution Licensee, as the case may be, shall be free to invite bids from developers. The developer bidding the lowest tariff will be allowed to install the power plant and sell the generated power to state utilities.

7.2 The tariff rates are inclusive of all charges on account of taxes/duties/cess/octroi etc. except Electricity Duty/Cess on sale of power. The Electricity Duty/Cess, if payable by the generators on sold energy to the Licensee, shall be payable by the Licensee in addition to the above tariff charges.

7.3 The tariff rates 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.

7.4 Accelerated Depreciation and Consequential Tariff

The above determined tariffs shall apply to projects that do not avail benefit of accelerated depreciation. The Commission further decides that for projects availing benefits of accelerated depreciation of the above tariff as determined, shall be reduced by **Rs. 0.97 per unit** for Solar Thermal and **Rs. 1.41 per unit** for Solar PV & for roof top PV and other small Solar Power Plants.

7.5 Power Purchase Agreement

7.5.1. The State Government has transferred and vested the functions, properties, interest, rights and obligations of the MPSEB relating to Bulk Purchase and Bulk Supply of Electricity along with the related agreements and arrangements in the State Government and re-transferred and re-vested there in the M.P. Power Trading Company Ltd. Therefore, the Commission directs that the energy generated by the solar based power generating units will be procured centrally by the M.P. Power Trading Co. Ltd. at the rates specified in this order. The energy so procured will be allocated by M.P. Power Trading Co. Ltd. to the three distribution licensees in the ratio of their actual energy input in each financial year. Accordingly, the Power Purchase Agreements will be signed between the developer and the M.P. Power Trading Co. Ltd., Jabalpur. The M.P. Power Trading Company Limited, Jabalpur in turn will have back to back power supply agreement with the Discoms. The agreements will be for exclusive sale/purchase of electricity for a period of 25 years

from the date of commissioning of plant. The M.P. Power Trading Company Limited, Jabalpur is directed to submit to the Commission a model agreement within one month from the date of the order.

- 7.5.2. The developers are required to get all the required statutory consents before entering into agreement with M.P. Power Trading Company Limited, Jabalpur.

7.6 Scheduling:

Solar based power generation plants have been presently kept out of the purview of 'scheduling' and 'merit order dispatch principles'.

7.7 Metering and billing:

- 7.7.1. The metering arrangement is 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.
- 7.7.2. Billing of the metered energy will be carried out on a monthly basis.
- 7.7.3. The meter reading will be carried out by the respective Discom where the energy is injected into the system.

7.8 Payment mechanism:

- 7.8.1. The Commission prescribes that a settlement period of 30 days from the date of submission of the bill to the concerned Discom where the power is injected, 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.
- 7.8.2. The bills favouring M.P. Power Trading 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 Trading Company Limited, Jabalpur for making payment to the developer. The M.P. Power Trading 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 Trading 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.
- 7.8.3. In case of delay beyond the 30 days payment period, the M.P. Trading Co. Ltd. will pay delayed payment surcharge on outstanding amount at the rate of 1.25% per month or part thereof.
- 7.8.4. In case the M.P. Trading 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 Trading Co. Ltd. to the developer through the irrevocable letter of credit on presentation of bill, an incentive of 2% of billed amount shall be allowed by the developer.

- 7.8.5. The delayed payment surcharge/incentive will also be passed on to the Distribution Licensees by the M.P. Power Trading Co. Limited.
- 7.8.6. The M.P. Power Trading Co. Ltd., Jabalpur shall submit by 15th of the following month of quarter to the Commission quarterly (ending June, September, December and March) the details of bills pending for payment at the end of quarter alongwith reasons thereof.

7.9 Default provisions for sale to utility:

- 7.9.1. In case payment is not made within 60 days of presentation of bill (i.e. thirty days more than the prescribed limit of thirty days for normal payment), the developer may issue fifteen clear day's notice to the M.P. Power Trading Company Limited to make the payment. This, however, will not absolve M.P. Power Trading Company Limited from payment of delayed payment surcharge as provided in clause 7.8.3 of this order. In case, M.P. Power Trading Company Limited still does not make the payment, the developer shall have the liberty to approach the Commission for allowing selling of power to a third party.

7.10 Other applicable conditions:

- 7.10.1. All statutory clearances and necessary approvals, if any, shall be obtained by the developer, for setting up of the project through Department of Non-conventional Energy Sources. The developer is also responsible for their compliance and their renewals as may be required from time to time.
- 7.10.2. The developer would ensure that the proposed location of the plant is in accordance with the policy guidelines of the Union/the State Government.
- 7.10.3. Other conditions in respect of minimum purchase requirement, banking, reduction in contract demand and drawing power during shut down period shall be applicable as per MPERC (Cogeneration and Generation of Electricity from Renewable Sources of Energy) Regulations, 2008 as amended from time to time.
- 7.10.4. The sharing of Clean Development Mechanism benefits shall be as per the provisions in CERC (Tariff for Renewable Energy Sources) Regulations, 2009 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.”

7.10.5. The distribution licensee is required to pass the same amount on to the consumers through the Annual Revenue Requirement. The developer is also required to inform to the distribution licensee by 15th April of each financial year regarding benefit received through Clean Development Mechanism during the previous financial year.

7.11 Specific terms and conditions applicable to Captive use/Third party sale:

7.11.1. The transmission charges to be levied for power from these projects will be decided by the Commission from time to time. This is in line with Government of M.P order dated 17th October, 2006.

7.11.2. The project developer is required to obtain Short/ Long Term Open Access permission in case of captive use/ third party sale. The 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. In case the point of injection and drawl fall within the jurisdiction of any of the Distribution Licensees involving the 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 Trading Co. and the developer shall not be required to execute a separate agreement with M.P. Power Transmission Company Limited.

7.11.3. 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 Trading 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 clause 11 of the Government of M.P. Policy for encouraging generation of power in M.P. through Non-conventional Energy Sources notified on 17.10.06. 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 licensees system network.

7.11.4. Reactive power supply:

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. Reactive energy charges would be paid by the

developer to the Distribution Licensees in whose territorial area the generator unit is located.

7.11.5. Where the developer has an 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, will purchase the power at the rate as applicable to inadvertent flow of energy mentioned in clause 7.11.6 below. In such cases, the developers are required to execute the Power Purchase Agreement with the licensee for the remaining period of project life.

7.11.6. 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. 4.35 per unit** being tariff rate applicable for wind electric generators.

Ordered accordingly.

Sd/-
(C.S.Sharma)
Member (Eco.)

Sd/-
(K.K.Garg)
Member (Engg.)

Place : Bhopal

Date : 6th July, 2010