MAHARASTHRA ELECTRICITY REGULATIORY COMMISSION

ELECTRICITY ACT, 2003.

No. MERC/Legal/2015/0333.—In exercise of the powers conferred under Sections 61, 66 and 86 read with Section 181 of the Electricity Act, 2003 and all other powers enabling it in this behalf, and after previous publication, the Maharashtra Electricity Regulatory Commission hereby makes the following Regulations, namely :—

1. Short title and commencement

1.1 These Regulations may be called the Maharashtra Electricity Regulatory Commission (Terms and Conditions for Determination of Renewable Energy Tariff) Regulations, 2015.

1.2 These Regulations shall come into force from the date of their publication in the *Official Gazette*.

2. Definitions and Interpretation

2.1 In these Regulations, unless the context otherwise requires,—

(*a*) 'Act' means the Electricity Act, 2003 (36 of 2003);

(*b*) 'Auxiliary energy consumption', means the quantum of energy consumed by auxiliary equipment of the Generating Station and transformer losses within the Generating Station, expressed as a percentage of the sum of gross energy generated at the generator terminals of all the Units of the Generating Station;

(*c*) 'Average Power Purchase Cost' or 'APPC' means the weighted average price at which the Distribution Licensee has purchased or is expected to purchase electricity (excluding procurement from RE sources), including the cost of self-generation, if any, as approved by the Commission in the relevant Tariff Order or any other general or specific Order;

(*d*) 'Biogas' means a gas created when organic matters like crop residues, sewage and manure breaks down in an oxygen-free environment;

(*e*) 'Biomass' means wastes produced during agricultural and forestry operations (such as straws and stalks, etc.) or produced as a by-product of processing operations of agricultural produce (such as husks, shells, de-oiled cakes, etc.); wood produced in dedicated energy plantations or recovered from wild bushes/weeds; and the wood waste produced in some industrial operations;

(*f*) 'Biomass gasification' means a process of incomplete combustion of biomass resulting in production of combustible gases consisting of a mixture of Carbon Monoxide (CO), Hydrogen (H_2) and traces of Methane (CH_4), which is called 'producer gas';

(*g*) 'Capacity Utilisation Factor' or 'CUF' means the ratio of actual gross energy generated by the project to the equivalent energy output at its rated capacity over the year;

(*h*) 'Central Commission' or 'CERC' means the Central Electricity Regulatory Commission referred to in sub-section (*1*) of Section 76 of the Act;

(*i*) 'CERC RE Tariff Regulations' means the Regulations of the Central Commission governing Renewable Energy ('RE') Tariff determination;

(*j*) 'Commission' or 'MERC' means the Maharashtra Electricity Regulatory Commission referred to in Section 82 of the Act;

(*k*) 'Conduct of Business Regulations' means the Maharashtra Electricity Regulatory Commission (Conduct of Business) Regulations, 2004 as amended from time to time;

(*l*) 'Date of Commissioning' means the date of commissioning declared by a Generating Company in relation to a Unit of its Generating Station;

(*m*) 'Eligible Project' means a—

i. Wind Power Project commissioned using new or re-powered wind turbine generators after notification of these Regulations;

ii. Small Hydro Power Project commissioned after notification of these Regulations and located at a site approved by the State Nodal Agency/State Government using new plant and machinery, and with installed power Project capacity of 25 MW or less at a single location;

iii. Mini Hydro Power Project commissioned after notification of these Regulations and located at a site approved by the State Nodal Agency/State Government using new plant and machinery, and with installed power Project capacity of 1000 kW or less, but above 500 kW;

iv. Micro Hydro Power Project commissioned after notification of these Regulations and located at a site approved by the State Nodal Agency/State Government using new plant and machinery, and with installed power Project capacity of 500 kW or less;

v. Biomass-based Power Project commissioned after notification of these Regulations, with new plant and machinery based on Rankine Cycle technology and using biomass fuel sources, provided the use of fossil fuel is restricted as stipulated under Regulation 45 of these Regulations;

vi. Non-Fossil Fuel-based Co-Generation Project commissioned after notification of these Regulations using new plant and machinery, and satisfying the following definitions and qualifying requirements;

Topping Cycle mode of Co-Generation – Any facility that uses non-fossil fuel input for power generation and which also utilizes the thermal energy generated for useful heat applications in other industrial activities simultaneously;

Provided that the use of fossil fuel is restricted as stipulated under Regulation 63 of these Regulations;

Provided further that the sum of useful power output and one half the useful thermal output should be greater than 45% of the facility's energy consumption, during season;

Explanation - For the purposes of this Clause 'useful power output' shall mean the gross electricity output (in kWh) from the generator. (The gross electricity is derived by adding the Auxiliary Consumption in the Co-Generation Project (e.g. in the boiler feed pump and the FD/ID fans) to the net electricity output);

'Useful Thermal Output' is the useful heat (steam) that is provided to the process by the Co-Generation Project;

'Energy Consumption' of the Co-Generation Project is the useful energy input that is supplied by the fuel ;

vii. Non-Fossil Fuel-based Non-Qualifying Co-Generation Project that does not fulfill the eligibility criteria and is commissioned after notification of these Regulations ;

viii. Solar PV, Solar Roof-top PV and Solar Thermal Power Project based on technologies approved by MNRE and commissioned after notification of these Regulations ;

ix. Waste to Energy Project based on technologies approved by MNRE and commissioned after notification of these Regulations ;

x. Hybrid RE Project based on RE technologies approved by MNRE, such as Wind-Solar Hybrid, Solar-Biomass Hybrid, Solar-Co-Generation Hybrid, Solar Thermal Hybrid, within the same premises and commissioned after notification of these Regulations.

xi. Biomass Gasifier and Biogas-based Project based on technologies approved by MNRE and commissioned after notification of these Regulations.

(*n*) 'Existing RE Project' means a Renewable Energy Project commissioned prior to the notification of these Regulations;

(*o*) 'Gross Calorific Value' or 'GCV', in relation to a fuel used in a Generating Station, means the heat produced in kCal by complete combustion of one kilogram of solid fuel or one litre of liquid fuel or one standard cubic meter of gaseous fuel, as the case may be;

(*p*) 'Hybrid Renewable Energy Project' means a Renewable Energy Project that uses a combination of Renewable Energy technologies approved by MNRE for electricity generation within the same premises;

(*q*) 'Installed Capacity' means the summation of the name plate capacities of all the Units of a Generating Station or the capacity of a Generating Station, reckoned at the generator terminals;

(*r*) 'Inter-connection Point' means the interface point of a Renewable Energy generating facility with the transmission system or distribution system, as the case may be, and

1. in relation to Wind Energy and Solar Photo Voltaic Projects, the inter-connection point shall be the line isolator on the outgoing feeder on the HV side of the Pooling sub-Station;

Explanation.—A Pooling sub-Station is a sub-Station, consisting of a step-up transformer and associated switchgear, to the LV side of which multiple generating Units (Wind Turbine Generators or Solar PV modules /arrays/inverter units) are connected.

2. in relation to Mini/Micro Hydro, Small Hydro, Biomass and Biomass gasification, Non-Fossil Fuel-based Co-Generation, Biogas-based, Hybrid Renewable Energy, Municipal Solid Waste and Solar Thermal Power Projects, the inter-connection point shall be the line isolator on the outgoing feeder on the HV side of the generator transformer;

(*s*) 'Micro Hydro Power Project' means a Hydro Power Project with a Station capacity up to and including 500 kW;

(*t*) 'Mini Hydro Power Project' means a Hydro Power Project with a Station capacity of 1 MW or less, but above 500kW;

(*u*) 'MNRE' means the Ministry of New and Renewable Energy of the Government of India;

(*v*) 'New RE Project' means a Renewable Energy Project commissioned after notification of these Regulations;

(*w*) 'Non-firm power' means the power generated from renewable sources as approved by MNRE from time to time, the hourly variation of which is dependent upon nature's phenomena, like sun or wind, that cannot be accurately predicted;

(*x*) 'Non fossil fuel-based Co-Generation' means the process in which more than one form of energy (such as steam and electricity) are produced in a sequential manner by use of biomass;

(*y*) 'Operation and maintenance expenses' or 'O&M expenses' means the expenditure incurred on operation and maintenance of a project, or part thereof, and includes the expenditure on manpower, repairs, spares, consumables, insurance and overheads;

(*z*) 'Project' means a Generating Station and the evacuation system up to the inter-connection point, as the case may be; and, in case of a Small Hydro Power Generating Station, includes all components of the generating facility such as the intake water conductor system and generating Units of the Scheme, as apportioned to power generation;

(*aa*) 'Renewable Energy' or 'RE' means the grid quality electricity generated from Renewable Energy sources;

(*bb*) 'Renewable Energy Power Project' means a power project, other than a conventional power Project, generating grid quality electricity from Renewable Energy sources;

(*cc*) 'Renewable Energy Sources' means the renewable sources such as Mini, Micro and Small Hydro, Wind, Solar, Biomass including bagasse, bio-fuel, urban or Municipal Solid Waste and such other sources as are recognized or approved by the MNRE;

(*dd*) 'Re-powering' means the process of replacing older wind turbines, operational for at least 15 years of useful life since their commissioning, with newer ones that have either a higher name plate capacity or higher efficiency which results in a net increase in power generated from the same site;

(*ee*) 'Review Period' means the period during which the norms for determination of tariff specified in these Regulations shall remain valid;

(*ff*) 'Small Hydro Power Project' means a Hydro Power Project with a Station capacity of 25 MW or less, but above 1 MW;

(*gg*) 'Solar PV Power Project' means a power project that uses sunlight for direct conversion into electricity through Photo Voltaic technology;

(*hh*) 'Solar Roof-top PV Power Project means a Solar Photo Voltaic Power Project installed on the roof-top of a building or any other mounting structure in the consumer premises that uses sunlight for direct conversion into electricity through Photo Voltaic technology and satisfies any other eligibility criteria as may be stipulated by MNRE;

(*ii*) 'Solar Thermal Power Project' means a power project that uses sunlight for direct conversion into electricity through Concentrated Solar Power technology based on line focus or point focus principle;

(*jj*) 'State Nodal Agency' means the Maharashtra Energy Development Agency ('MEDA') or such other entity as may be so designated by the Commission from time to time;

(*kk*) 'Station Heat Rate' or 'SHR' means the heat energy input in kCal required to generate one kWh of electrical energy at generator terminals of a Renewable Energy Project that uses fuel for generation;

(*ll*) 'Tariff period' means the period for which the tariff is to be determined by the Commission on the basis of norms specified under these Regulations;

(*mm*) 'Useful Life', in relation to a Unit of a Generating Station, including the evacuation system, means the following duration from the date of commercial operation ('COD') of such generation facility, namely :—

a. Wind Energy Power Projects	25 years
b. Biomass-based Power Project, Non-Fossil Fuel-based Co-Generation.	20 years
c. Mini/Micro and Small Hydro Power Projects	35 years
d. Solar PV/Solar Thermal Power Projects	25 years
e. Solar Roof-top PV systems Power Projects	25 years

Provided that the Useful Life of other RE Projects shall be as stipulated by the Commission while determining the Project specific tariff, taking into consideration the norms of the Central Commission;

(*nn*) 'Year' means a financial year.

2.2 Save as aforesaid and unless repugnant to the context or if the subject matter otherwise requires, words and expressions used in these Regulations which are not specifically defined herein but defined in the Act, shall have the meaning assigned to them in the Act; and, if not defined in the Act, shall have the meaning assigned to them in any Act of the Parliament or the State Legislature applicable to the electricity industry and the Regulations framed by the Commission under the Act.

3. Scope of Regulations and extent of application

3.1 These Regulations shall apply to those new RE Projects which are commissioned in the State of Maharashtra for the generation and sale of electricity to Distribution Licensees in the State, are Eligible Projects for the purposes of these Regulations, and whose tariff is to be determined by the Commission under the provisions of Section 62 read with Section 86 of the Act :

Provided that, where a RE Project opts for the Renewable Energy Certificate ('REC') mechanism specified in the MERC (Renewable Purchase Obligation, its Compliance, and Implementation of REC Framework) Regulations, 2010, its pricing mechanism shall be governed by the provisions of those Regulations or as may be specified in future.

3.2 The tariff and other terms and conditions applicable to existing RE Projects shall be governed by the provisions of the RE Tariff Orders issued by the Commission from time to time :

Provided that conditions stipulated under Second Proviso of Regulation 5.1 of Maharashtra Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2010 shall continue to apply in case of such Existing RE Projects.

4. General reporting requirements

4.1 Distribution Licensees shall furnish the following quarterly information to State Nodal Agency, within a month of the close of the preceding quarter,

a) details of source-wise RE capacity addition in MW;

b) details of purchase of RE in MUs; and

c) a statement of Energy Purchase Agreements (EPAs) entered into under these Regulations,

in addition to any other information that the Commission may stipulate from time to time. The Distribution Licensees shall also upload and update the above information on their websites on a quarterly basis, along with details of capacity addition in previous years.

4.2 The Commission or State Nodal Agency may from time to time stipulate any other financial, technical or other information required to be furnished by the RE Project Entities, including information regarding RE Project performance parameters such as actual energy generated, monthly actual CUF and actual Auxiliary consumption, if applicable; and financial information such as Capital Cost, yearly O&M Expenses, details of loans and financing, and interest rate; etc.

Chapter 1: General Principles

5. Competitive Bidding for procurement of power generated by grid-connected RE Projects

The Commission shall adopt the tariff for a RE Power Project where such tariff has been determined through a transparent process of competitive bidding in accordance with guidelines under Section 63 of the Act as and when issued by the Central Government.

6. Review Period

6.1 The Review Period under these Regulations shall be five financial years (FY), upto the end of FY 2019-20. The first year of the Review Period shall commence from the date of notification of these Regulations.

6.2 The Regulations for the subsequent Review Period shall be notified separately :

Provided that, if the Regulations for the subsequent Review Period are not notified by the commencement of such Period, the tariff norms specified in these Regulations shall continue to apply until such Regulations are notified, subject to any adjustments that may be specified therein.

7. Tariff Period

7.1 The Tariff Period for Wind Power, Biomass-based, Solar PV, Solar Roof-top PV and Non-Fossil Fuel-based Co-Generation Projects shall be thirteen (13) years.

7.2 The Tariff Period for Small Hydro Power Projects of capacity exceeding 5 MW and upto and including 25 MW shall be thirteen (13) years.

7.3 The Tariff Period for Small Hydro Power Projects of 5 MW capacity or less and for Mini/ Micro Hydro Power projects shall be thirty five (35) years.

7.4 The Tariff Period for Solar Thermal Projects shall be twenty five years (25) years.

7.5 The Tariff Period shall commence from the date of commercial operation of the Generating Station or Unit, as the case may be.

8. Project-specific tariff

8.1 A Project-specific tariff shall be determined by the Commission on a case-to case basis for the following types of Projects:

(*a*) Waste to Energy Projects based on the technologies approved by MNRE such as Municipal Solid Waste-based Projects;

(*b*) Projects based on any other RE technologies approved by MNRE after notification of these Regulations;

(*c*) Solar Thermal Power Projects in respect of which the Project Entities opt for a project-specific tariff :

Provided that, while determining the project-specific tariff for such Solar Thermal Projects, the Commission shall be guided by the provisions of Chapter 8;

(*d*) Hybrid RE Projects based on RE technologies approved by MNRE, such as Wind-Solar Hybrid, Solar-Biomass Hybrid, and Solar-Co-Generation Hybrid;

(*e*) Biomass-based Projects other than those based on Rankine Cycle technology application with water-cooled condenser;

(*f*) Biomass Gasifier and Biogas-based Projects.

8.2 The determination of project-specific tariff for generation of electricity from such RE sources shall be in accordance with such terms and conditions as may be stipulated in the relevant Orders of the Commission :

Provided that the financial norms specified in Chapter 2, except with regard to Capital Cost and O&M expenses, shall be the ceiling norms while determining such project-specific tariff.

9. Petition and proceedings for determination of tariff

9.1 The Commission shall notify the generic tariff as far as practicable before or at the beginning of each year of the Review Period considering the norms specified by the Central Commission from time to time with regard to the respective RE technologies :

Provided that, for the first year (FY 2015-16) of the Review Period, the generic tariff may be determined by the Commission within three months from the date of notification of these Regulations.

9.2 A Petition for determination of project-specific tariff shall be accompanied by such fee as may be specified in the applicable Regulations of the Commission, and shall be accompanied by :

(*a*) Information in Forms 1.1, 1.2, 2.1 and 2.2, as the case may be, appended as Annexure-A to these Regulations;

(*b*) A detailed project report outlining technical and operational details, site-specific aspects, premises for Capital Cost and financing plan, etc.;

(*c*) A statement of all applicable terms and conditions and expected expenditure for the period for which tariff is to be determined;

(*d*) A statement containing details of any grant, subsidy or incentive received, due or assumed to be due from the Central Government and/or State Government, which shall also include the computation of tariff without consideration of such grant, subsidy or incentive;

(*e*) Details of financial gain through REC or any other mechanism;

(*f*) Any other information that the Commission may require the Petitioner to submit.

9.3 The proceedings for determination of tariff shall be in accordance with the Conduct of Business Regulations.

10. Tariff Structure

The tariff for Projects based on RE technologies shall be a single-part tariff consisting of the following fixed cost components:

(*a*) Return on equity;

(*b*) Interest on loan capital;

(*c*) Depreciation;

(*d*) Interest on working capital;

(*e*) Operation and maintenance expenses;

Provided that, for RE Projects based on technologies having a fuel cost component, like Biomass-based Power Projects and non-fossil fuel-based Co-Generation Projects, a single-part tariff with two components, *viz*., fixed cost component and fuel cost component, shall be determined.

11. Tariff Design

11.1 The tariff shall be determined on a levelised basis for the Tariff Period :

Provided that, for RE Projects having a single-part tariff with two components, the tariff shall be determined on a levelised basis considering the year of commissioning of the Project for the fixed cost component, while the fuel cost component shall be specified on the basis of the year of operation.

11.2 For the purpose of computation of levelised tariff, a discount factor equivalent to the normative post-tax weighted average cost of capital shall be considered.

11.3 Levelisation shall be carried out for the 'useful life' of the RE Project, while tariff shall be determined for the period equivalent to the Tariff Period.

12. Despatch principles for electricity generated from RE Sources

12.1 Subject to the provisions of the Indian Electricity Grid Code and the State Electricity Grid Code, all RE Power Projects, except for Biomass-based Power Projects and Co-Generation Project, shall be treated as 'Must Run' Projects and shall not be subjected to 'merit order despatch' principles.

12.2 The Biomass-based Power Projects and Co-Generation Projects shall be subject to the scheduling and despatch code as specified under the State Grid Code:

Provided that, in case any other scheduling provisions for RE Projects are made by the appropriate authorities, these may be applied to the RE Projects in the State by the Commission by general or specific Order.

Chapter 2 : Financial Principles

13. Capital Cost

The norms for Capital Cost as specified in the subsequent RE technology-specific Chapters shall be inclusive of all capital works, including land cost, plant and machinery, civil works, erection and commissioning, financing costs, preliminary and pre-operative expenses, interest during construction, and evacuation infrastructure up to the inter-connection point:

Provided that a Petition for project-specific tariff determination shall provide the break-up of Capital Cost items in the manner specified in Regulation 9.

14. Debt-equity Ratio

14.1 For determination of the generic tariff by the Commission, the debt-equity ratio shall be considered to be 70 : 30.

14.2 For project-specific tariff determination, if the equity actually deployed is more than 30% of the Capital Cost, the equity in excess of 30% shall be treated as normative loan:

Provided that, where the equity actually deployed is less than 30% of the Capital Cost, the actual equity shall be considered for determination of tariff;

Provided further that the equity invested in foreign currency shall be denominated or designated in Indian rupees as on the date of each investment.

15. Loan and Finance Charges

15.1 Loan Tenure :

For the purpose of determination of tariff, the loan tenure shall be considered as 12 years.

15.2 Interest Rate :

The quantum of loan arrived at as specified above shall be considered as the gross normative loan for computation of the interest on loan. The normative loan outstanding as on 1st April of every year shall be worked out by deducting the cumulative repayment up to 31st March of the previous year from the gross normative loan.

For the purpose of computation of tariff, the Base Rate of the State Bank of India prevailing during the previous year plus 300 basis points shall be considered as the normative interest rate.

Notwithstanding any moratorium period availed, the repayment of loan shall be considered from the first year of commercial operation of the Project and shall be equal to the annual depreciation allowed.

16. Depreciation

16.1 The value base for the purpose of depreciation shall be the capital cost of the asset as admitted by the Commission. The salvage value of the asset shall be considered as 10%, and depreciation shall be allowed up to a maximum of 90% of the capital cost of the asset.

16.2 Annual Depreciation shall be based on the 'Differential Depreciation Approach' using the 'Straight Line Method' over two distinct periods comprising loan tenure and the period beyond loan tenure over the useful life. The depreciation rate for the first 12 years of the Tariff Period shall be 5.83% per annum, and the remaining depreciation shall be spread over the remaining useful life of the project from the 13th year onwards.

16.3 Depreciation shall be chargeable from the first year of commercial operation.

17. Return on Equity

17.1 The value base for the equity shall be 30% of the Capital Cost, or the actual equity (in case of project-specific tariff determination) as determined under Regulation 14.

17.2 The Return on Equity shall be computed at the base rate of 16%, to be grossed up as per the applicable tax rate.

17.3 The rate of Return on Equity shall be computed by grossing up the base rate with the tax rate equivalent to the weighted average of the Minimum Alternate Tax ('MAT') during the year for the first 10 years from COD, and the weighted average of normal tax rate during the year for the remaining years of Project life.

18. Interest on Working Capital

18.1 The Working Capital requirement in respect of Wind Energy Projects and Small Hydro, Solar PV and Solar Thermal Power Projects shall consists of :

a) O&M expenses for one month;

b) Receivables equivalent to two months of tariff for sale of electricity calculated on the normative CUF;

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

18.2 The Working Capital requirement in respect of Biomass-based Projects and non-fossil fuel-based Co-Generation Projects shall consists of:

a) Fuel costs for four months equivalent to normative Plant Load Factor ('PLF');

b) O&M expenses for one month;

c) Receivables equivalent to two months of fixed and variable charges for sale of electricity calculated on the target PLF;

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

18.3 Interest on Working Capital shall be the average of the Base Rate of State Bank of India prevalent during the previous year, plus 350 basis points.

19. Operation and Maintenance Expenses

19.1 O&M expenses shall comprise repair and maintenance ('R&M') expenses, establishment (including employee) expenses, and administrative and general expenses including insurance.

19.2 O&M expenses shall be determined for the Tariff Period based on normative O&M expenses specified by the Commission in these Regulations for the first year of the Review Period.

19.3 Normative O&M expenses allowed under these Regulations shall be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff over the Tariff Period, for computation of the levelised tariff.

20. Rebate

20.1 For payment of bills of the Project Entity through Letter of Credit, a rebate of 2% shall be allowed.

20.2 Where payments are made other than through Letter of Credit within one month of presentation of bills by the Project Entity, a rebate of 1% shall be allowed.

21. Late Payment Surcharge

In case the payment of any bill for charges payable under these Regulations is delayed beyond a period of sixty days from the date of billing, a late payment surcharge at the rate of 1.25% per month shall be levied by the Project Entity.

22. Sharing of Clean Development Mechanism (CDM) Benefits

All risks, costs and efforts associated with the availing of carbon credits shall be borne by the Project Entity. The entire proceeds of carbon credit from approved CDM Project, if any, shall be retained by it.

23. Reactive Energy Charges

The Reactive Energy Charges will be governed by general or specific Orders issued by the Commission from time to time, or as may be specified by the Commission in future.

24. Grant, Subsidy or Incentive from the Central/State Government

The Commission shall take into consideration any grant, subsidy or incentive offered by the Central or State Government or their agencies, including accelerated/additional depreciation benefit, if availed, while determining the tariff under these Regulations:

Provided that the State Nodal Agency shall inform the Distribution Licensee regarding any such grant, subsidy or incentives received by a Project Entity on a quarterly basis :

Provided further that any such grant, subsidy or incentives availed by a Project Entity shall be deducted by the Distribution Licensee in subsequent bills raised by the particular Project Entity towards sale of electricity in suitable installments or within such period as may be stipulated by the Commission :

Provided also that the following principles shall be considered for ascertaining the Income Tax benefit on account of accelerated or additional depreciation, if availed, for the purpose of tariff determination :

a. The assessment of benefit shall be based on normative Capital Cost, accelerated/ additional depreciation rate as per the relevant provisions of the Income Tax Act and the Corporate Income Tax rate;

b. Capitalisation of RE Projects for the full financial year;

c. Per-unit benefit shall be derived on levelised basis at a discounting factor equivalent to the post-tax weighted average cost of capital :

Provided also that, in case the Central or State Government or their agencies provide any generation-based incentive which is specifically over and above the tariff, such incentive shall not be taken into account while determining the tariff.

25. Taxes and Duties

The tariff determined under these Regulations shall be exclusive of taxes and duties on the generation and sale of electricity from a RE Project as may be levied by the appropriate Government:

Provided that the taxes and duties levied by the appropriate Government on generation, and sale of electricity from such RE Project, such as Electricity Duty and Water Royalty, shall be allowed as a pass-through to the extent actually incurred.

Chapter 3 : Technology-specific parameters for Wind Energy Projects

26. Capital Cost

26.1 The Capital Cost for Wind Energy Projects shall include the Wind Turbine Generator including its auxiliaries, land cost, site development charges and other civil works, transportation charges, evacuation cost up to inter-connection point, financing charges and Interest during Construction, and capital investment relating to forecasting and scheduling.

26.2 The Capital Cost for Wind Energy Projects shall be considered as Rs. 600.74 Lakh/MW in the first year of the Review Period for the purpose of tariff determination, and shall be revised in respect of projects to be commissioned in each subsequent year as specified in Regulation 27.

27. Capital Cost Indexation Mechanism

The Capital Cost of the Wind Energy Projects shall be revised for each year of the Review Period considering the indexation mechanism specified in the CERC RE Tariff Regulations.

28. Capacity Utilisation Factor

28.1 The CUF norms for Wind Energy Projects for the Review Period shall be as follows for the purpose of tariff determination:

Wind Zone	Annual Mean Wind Power Density (W/m²)	CUF
Zone 1	<=250	22%
Zone 2	>250 - <=300	25%
Zone 3	>300 - <=400	30%
Zone 4	>400	32%

Provided that these CUF norms may be revised by the Commission through general or specific Order considering data that may become available subsequently.

28.2 The annual mean wind power density specified in Regulation 28.1 shall be measured at 80 meter hub height, and State Nodal Agency shall certify the Wind Zone relevant to the proposed Wind Energy Project.

28.3 For the purpose of classification of a Wind Energy Project in a particular Wind Zone class, the State Nodal Agency shall refer to the wind power density map prepared by the National Institute for Wind Energy.

29. Operation and Maintenance Expenses

29.1 Normative O&M expenses for the base year of the Review Period shall be 1.47% of the Capital Cost for the purpose of tariff determination.

29.2 Normative O&M expenses allowed under these Regulations shall be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff, to compute the levelised tariff.

Chapter 4 : Technology-specific parameters for Small Hydro Power Projects

30. Capital Cost

30.1 The normative Capital Cost for Small Hydro Power Projects during the first year of the Review Period shall be as follows for the purpose of tariff determination:

Project Size	Capital Cost (Rs. lakh/MW)
> 1 MW and upto and including 5 MW	605.28
> 5 MW and upto and including 25 MW	550.70

30.2 The Capital Cost for subsequent years shall be revised for Projects to be commissioned in each subsequent year as specified in Regulation 31.

31. Capital Cost Indexation Mechanism

The Capital Cost of Small Hydro Power Projects shall be revised for each year of the Review Period considering the indexation mechanism specified in the CERC RE Tariff Regulations.

32. Capacity Utilisation Factor

The CUF for Small Hydro Power Projects shall be 30% for the purpose of tariff determination.

33. Auxiliary Consumption

Normative Auxiliary Consumption for Small Hydro Power Projects shall be 1.0% for the purpose of tariff determination.

34. Operation and Maintenance Expenses

34.1 Normative O&M expenses for the base year of the Review Period for the purpose of tariff determination shall be as follows:

Project Size	O&M Expenses (Rs lakh/MW)
> 1 MW and upto and including 5 MW	3.60% of the Capital Cost.
> 5 MW and upto and including 25 MW	2.80% of the Capital Cost.

34.2 Normative O&M expenses allowed under these Regulations shall be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff, for the purpose of determination of the levelised tariff.

35. Tariff for Mini/Micro Hydro Power Projects

35.1 The tariff for Mini Hydro Power Projects with capacity of 1 MW and less but more than 500 kW shall be higher by Rs 0.50 per kWh than that applicable to Small Hydro Power Projects with installed capacity of 5 MW or less but more than 1 MW.

35.2 The tariff for Micro Hydro Power Projects with capacity of 500 kW and below shall be higher by Rs. 1.00 per kWh than that applicable to Small Hydro Power Projects with installed capacity of 5 MW or less but more than 1 MW.

Chapter 5 : Technology-specific parameters for Biomass-based Power Projects

36. Technology

The norms for tariff determination specified in this Chapter are for Biomass-based Power Projects based on Rankine Cycle technology application using water-cooled condenser.

37. Applicability

37.1 The Capital Cost and performance norms specified in this Chapter shall be applicable only to new Biomass-based Power Projects commissioned after notification of these Regulations.

37.2 The fuel-related aspects specified in Regulations 44 to 50 shall be applicable to both existing and new Biomass-based Power Projects :

Provided that the norms in respect of SHR and Auxiliary Consumption factor for existing Biomass-based Power Projects shall be as stipulated in the respective RE Tariff Orders referred to in Regulation 3.2.

38. Capital Cost

The normative Capital Cost of Biomass-based Power Projects shall be considered as Rs. 494.32 lakh/MW for the first year of the Review Period for the purpose of tariff determination, and shall be revised in respect of Projects commissioned in each subsequent year of the Review Period as specified in Regulation 39.

39. Capital Cost Indexation Mechanism

The Capital Cost of the Biomass-based Power Projects shall be revised for each year of the Review Period considering the indexation mechanism specified under the CERC RE Tariff Regulations.

40. Plant Load Factor

40.1 The PLF for the purpose of determining the fixed charge component of the tariff for Biomass-based Power Projects shall be:

1) During stabilisation: 60%;
2) During the remaining period of the first year (after stabilisation): 70%;
3) From 2nd year onwards: 80%.

40.2 The stabilisation period shall not be longer than 6 months from the date of commissioning of a Project.

41. Auxiliary Consumption

The Auxiliary Power Consumption for Biomass-based Power Projects shall be 10% for the purpose of tariff determination.

42. Station Heat Rate

The SHR for new Biomass-based Power Projects shall be 4200 kcal/kWh for the purpose of tariff determination.

43. Operation and Maintenance Expenses

43.1 Normative O&M expenses for the base year of the Review Period shall be 5.32% of the Capital Cost for the purpose of tariff determination.

43.2 Normative O&M expenses allowed under these Regulations shall be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff, to compute the levelised tariff.

44. Fuel Mix

44.1 The Biomass-based Power Project shall be designed in such a way that it uses different types of non-fossil fuels available within its vicinity such as crop residues, agro-industrial residues, forest residues, etc. or other biomass fuels as may be approved by MNRE.

44.2 The Project Entity shall prepare fuel management plans to ensure adequate availability of fuel to meet the Project requirements.

45. Use of Fossil Fuel

The use of fossil fuels shall be limited to the extent of 15% of the total fuel consumption on an annual basis, or to such other extent as may be stipulated by MNRE from time to time.

46. Monitoring of use of Fossil Fuel

46.1 The Project Entity shall, along with its monthly energy bill, furnish a monthly fuel procurement and fuel usage statement certified by a Chartered Accountant to the Distribution Licensee with whom an EPA has been entered into, with a copy to State Nodal Agency, for the purpose of monitoring the fossil and non-fossil fuel consumption. The statement shall include details such as –

a. Quantity of fuel (in tonnes) for each fuel type (biomass fuels and fossil fuels) procured and consumed during the month for power generation ;

b. Cumulative quantity (in tonnes) of each fuel type procured and consumed till the end of the month during the year ;

c. Actual (gross and net) energy generation (in kWh) during the month ;

d. Cumulative actual (gross and net) energy generation (in kWh) until the end of that month during the year ;

e. Opening fuel stock quantity (in tonnes) ;

f. Receipt of fuel quantity (in tonnes) at the power Project site ;

g. Closing fuel stock quantity (in tonnes) for each fuel type (biomass fuels and fossil fuels) available at the power Project site.

46.2 Non-compliance in any financial year with the conditions regarding fossil fuel usage shall render such Biomass-based Power Project ineligible to avail the generic tariff determined in accordance with these Regulations from the date of and for the duration of the default during such financial year :

Provided that such defaulting Biomass-based Project shall continue to sell power to the Distribution Licensee during the period of default at the APPC of such Licensee for the relevant year.

47. Compliance Monitoring for Biomass-based Power Projects

47.1 The Distribution Licensee procuring power from them shall be responsible for monitoring compliance by Biomass-based Power Projects with these Regulations.

47.2 The concerned Distribution Licensee shall maintain all data relevant to these Regulations, including technical and commercial details, in respect of Biomass-based Projects from whom it is procuring power, and shall make the data available in the public domain by publishing it on its website and updating it on a quarterly basis.

47.3 Project Entities shall submit the information to Distribution Licensee procuring power in the templates specified in Annexure-B of these Regulations.

48. Calorific Value

The average Calorific Value of the biomass fuel(s) used for the purpose of determination of tariff for new Biomass-based Power Projects shall be 3611 kcal/kg.

49. Fuel Cost

The biomass fuel price shall be considered as Rs. 3987/MT during the first year of the Review Period, and shall thereafter be linked to the indexation mechanism specified in Regulation 50.

50. Fuel Price Indexation Mechanism

50.1 In the case of both existing and new Biomass-based Power Projects, the following indexing mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of the variable charge component of tariff:

The Variable Charge for the nth year shall be computed as under :

$VC_n = VC_1 x (P_n / P_1)$

where,

VC_1 represents the Variable Charge based on Biomass Price P1 for first year as specified under Regulation 49, and which shall be determined as under :

$$VC1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Auxillary Consumption Factor})} \times \frac{P1}{1000}$$

$P_{(n)}$ = Price per tonne of biomass for the n^{th} year to be considered for tariff determination

$P_{(n-1)}$ = Price per tonne of biomass for the $(n-1)^{th}$ year to be considered for tariff determination.

P_1 shall be the Biomass price for FY 2015-16 as specified under Regulation 49.

The Biomass fuel price shall be revised by the Commission taking into consideration the Biomass fuel price determined by the Central Commission or a normative escalation factor of 5% per annum, as it may consider appropriate.

Chapter 6 : Technology-specific parameters for Non-fossil fuel-based Co-Generation Projects

51. Technology

A Project shall qualify as a Non-fossil Fuel-based Co-Generation Project if it is in accordance with the eligibility criteria specified in Regulation 2.1(m).

52. Applicability

52.1 The Capital Cost and performance norms specified in this Chapter shall be applicable only to Non-Fossil Fuel-based Co-Generation projects commissioned after notification of these Regulations.

52.2 The fuel-related aspects specified under Regulations 59 to 66 shall be applicable to both existing and new Non-Fossil Fuel-based Co-Generation Projects :

Provided that the norms in respect of specific fuel consumption and Auxiliary Consumption factor for existing Non-Fossil Fuel-based Co-Generation Projects shall be as stipulated in the respective RE Tariff Orders referred to in Regulation 3.2.

53. Capital Cost

The normative Capital Cost for Non-Fossil Fuel-based Co-Generation Projects shall be considered as Rs. 489.02 lakh/MW for the first year of the Review Period for the purpose of tariff determination, and shall be revised for Projects to be commissioned in each subsequent year as specified in Regulation 54.

54. Capital Cost Indexation Mechanism

The Capital Cost of the Non-Fossil Fuel-based Co-Generation Projects shall be revised for each year of the Review Period considering the indexation mechanism specified under the CERC RE Tariff Regulations.

55. Plant Load Factor

55.1 For the purpose of determining the fixed charge, the PLF for non-fossil fuel-based Co-Generation Projects shall be computed on the basis of plant availability for the number of operating days, considering operations during the crushing season and the off-season, as specified below, and a Load Factor of 92%.

55.2 The number of operating days considered shall be as follows:—

Operating Days	Plant Load Factor (%)
180 days (crushing) + 60 days (off-season) = 240 days operating days	60%

56. Auxiliary Consumption

The Auxiliary Power Consumption shall be 8.5% for the purpose of tariff determination.

57. Station Heat Rate

A SHR of 3600 kcal/kWh shall be considered for the purpose of tariff determination.

58. Operation and Maintenance Expenses

58.1 Normative O&M expenses during the base year of the Review Period shall be 3.54 % of the Capital Cost for the purpose of tariff determination.

58.2 Normative O&M expenses allowed under these Regulations shall be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff, to compute the levelised tariff.

59. Calorific Value

The Gross Calorific Value for bagasse shall be considered as 2250 kcal/kg. For the use of biomass fuels other than bagasse, the calorific value as specified in Regulation 48 shall be considered.

60. Fuel Cost

60.1 The price of bagasse shall be considered as Rs. 2326.84 /MT during the first year of the Review Period for the purpose of tariff determination, and shall thereafter be linked to the indexation formulae specified in Regulation 61.

60.2 For use of biomass other than bagasse, the biomass prices as specified under Regulation 49 shall be applicable.

61. Fuel Price Indexation Mechanism

61.1 In the case of both existing and new non-fossil fuel-based Co-Generation Projects, the following indexation mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of the variable charge component of tariff :—

The Variable Charge for the nth year shall be computed as under—

$$VC_n = VC_1 x (P_n / P_1)$$

where,

VC_1 represents the Variable Charge based on Bagasse Price P1 for first year as specified under Regulation 60, and which shall be determined as under :

$$VC1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Auxillary Consumption Factor})} \times \frac{P1}{1000}$$

$P_{(n)}$ = Price per tonne of Bagasse for the n^{th} year to be considered for tariff determination.

$P_{(n-1)}$ = Price per tonne of Bagasse for the $(n-1)^{th}$ year to be considered for tariff determination. P_1 shall be the Bagasse price for FY 2015-16 as specified under Regulation 60.

The Bagasse fuel price shall be revised by the Commission taking into consideration the Bagasse fuel price determined by the Central Commission or a normative escalation factor of 5% per annum, as it may consider appropriate.

62. Fuel Mix and Co-Generation Project Capacity

62.1 The Co-Generation Power Project may be designed to use different types of non-fossil fuels available within its vicinity, such as bagasse and crop residues, bio-gas, agro-industrial residues, forest residues, etc., or other biomass fuels as may be approved by MNRE.

62.2 The Co-Generation Projects shall be sized in co-relation to the locally available non-fossil fuels.

62.3 The Project Entity shall prepare a fuel management plan to ensure adequate availability of fuel to meet the Project requirements.

63. Use of Fossil Fuel

The use of fossil fuels shall be limited to 15% of total fuel consumption on an annual basis, or to such other extent as may be stipulated by MNRE from time to time.

64. Monitoring Mechanism for the use of fossil fuel and Co-Generation Efficiency

The provisions of Regulations 46 and 47 relating to Biomass-based Projects shall apply *mutatis mutandis* to Non-Fossil Fuel-based Co-Generation Projects.

65. Measurement and Verification Protocol for Compliance Monitoring

65.1 An Energy Audit of the Co-Generation Project shall be conducted by the Project Entity once a year, during the crushing season, through a Certified Energy Auditor or an Energy Auditor empanelled by State Nodal Agency, and report furnished to the Distribution Licensee. The dates of the Audit shall be intimated to the purchasing Distribution Licensee, who shall have the option to depute its representative to participate in the Audit. The Distribution Licensee shall scrutinise such Audit reports so as to verify compliance by the Project.

65.2 The Energy Audit shall be conducted during a period of steady load on the Plant during the season.

65.3 In addition to any others, the following readings/stipulations shall be mandatory for such Audit :—

(*a*) Duration of Test.– The duration shall be at least one hour of continuous operation.

(*b*) Input fuel (e.g. Bagasse) flow.– The total quantity of fuel supplied to a boiler for the duration of the test is to be measured (in case the continuous measurement of fuel inflow is not possible, an average figure of fuel intake/hour may be taken as the basis. To arrive at this average, the fuel weighment over a period of constant plant load operation – either on 8-hours shift or 24 hours, as the case may be – shall be considered). Mass flow rate of non-fossil fuel – bagasse, i.e. (mass balance is to be then calculated in kg/hr).

(*c*) A sample of input fuel (e.g. bagasse) is to be tested (certified laboratory test report to be included) for its Gross Calorific Value using a bomb calorimeter.

(*d*) Temperatures and pressures are to be measured at the different steam consumption points say, 1,2,...n (T1, P1, T2, P2,....Tn, Pn etc.)

(*e*) The steam flow rates at 1,2, ...n (m1, m2,....mn) are to be measured with on line steam flow meters. The flow meters are to be calibrated before the Audit.

(*f*) Electrical output at generator terminals is to be recorded in kWh for the test period.

(*g*) A schematic of the configuration showing the instrument locations shall be provided.

65.4 The Energy Audit shall include computation of the boiler efficiency (based on direct or indirect method), the turbine isentropic efficiency and the auxiliary electricity consumption of the Co-Generation facility.

65.5 Before entering into EPA, the Distribution Licensee shall ensure that the manufacturer's test certificates for boiler efficiency and the turbine characteristic curves (steam flow rate vs. power output) are provided to it along with the detailed project report.

65.6 The Co-Generation Project Entity shall appoint, at its cost, an independent Certified Energy Auditor or an Auditor for conducting Energy Audit as above, from among the panel of Auditors prepared by State Nodal Agency.

65.7 The Audit results shall be reported to the Commission by the Distribution Licensee annually after the closing the crushing season.

66. Compliance Monitoring of Non-fossil Fuel-based Co-Generation Projects

66.1 The Distribution Licensee procuring power from them shall be responsible for monitoring compliance by the Non-fossil Fuel-based Co-Generation Projects with these Regulations.

66.2 The concerned Distribution Licensee shall maintain all data relevant to these Regulations, including technical and commercial details, in respect of Non-Fossil Fuel-based Co-Generation Projects from whom it is procuring power, and shall make the data available in the public domain by publishing it on its website and updating it on a quarterly basis.

66.3 Project Entities shall submit the information to Distribution Licensee procuring power in the templates specified in Annexure-B.

67. Tariff for Non-fossil fuel-based Non-Qualifying Co-Generation Projects

67.1 The tariff for a Non-fossil Fuel-based Non-qualifying Co-Generation Project shall be equivalent to the APPC of the Distribution Licensee procuring power for that year.

67.2 The APPC for each year of the Review Period shall be applicable for the purpose of billing during that year.

Chapter 7: Technology-specific parameters for Solar PV Power Projects

68. Technology Aspects

The norms for Solar PV Power Projects under these Regulations shall be applicable for grid-connected PV systems at HT Voltage level that uses sunlight for dirtect conversion into electricity through Photo Voltaic technology as approved by MNRE:

Provided that the norms specified under these Regulations shall be applicable to Gross Metering and not to Net Metering purposes.

69. Capital Cost

The normative Capital Cost of a Solar PV Power Project shall be considered as Rs. 605.85 lakh/MW for base year for the purpose of tariff determination.

70. Capacity Utilisation Factor

The CUF of a Solar PV Project shall be considered as 19% for the purpose of tariff determination.

71. Operation and Maintenance Expenses

71.1 The O&M Expenses for the base year of the Review Period shall be Rs. 13 lakh/MW.

71.2 The normative O&M expenses allowed under these Regulations shall be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff, to compute the levelised tariff.

72. Tariff for Solar Roof-top PV Power Projects

The tariff for Solar Roof-top PV Power Projects shall be higher by Rs 0.50/kWh, or by such other amount as may be stipulated by the Commission from time to time, than the tariff applicable for Solar PV Power Projects determined under this Regulations.

Chapter 8 : Technology-specific parameters for Solar Thermal Power Projects

73. Technology Aspects

The norms for Solar Thermal Power Projects under these Regulations shall be applicable to Projects that use sunlight for conversion into electricity through Concentrated Solar Power technology based on either line focus or point focus principle.

74. Capital Cost

The normative Capital Cost of a Solar Thermal Power Project shall be considered as Rs. 1200 lakh/MW for base year for the purpose of tariff determination:

Provided that the Commission may deviate from this norm in case of project-specific tariff determination under Regulations 8 and 9.

75. Capacity Utilisation Factor

The CUF of a Solar Thermal Power Project shall be considered as 23% for the purpose of tariff determination:

Provided that the Commission may deviate from this norm in case of project-specific tariff determination under Regulations 8 and 9.

76. Operation and Maintenance Expenses

76.1 The O&M expenses for the base year of the Review Period shall be Rs. 15 lakh per MW for the purpose of tariff determination.

76.2 The Normative O&M expenses allowed under these Regulations shall be escalated at the rate specified in the Regulations of the Commission governing Multi Year Tariff, to compute the levelised tariff.

77. Auxiliary Consumption

The Auxiliary Consumption factor shall be 10% for the purpose of tariff determination;

Provided that the Commission may deviate from this norm in case of project-specific tariff determination under Regulations 8 and 9.

Chapter 9 : Miscellaneous

78. Deviation from norms

The tariff for sale of electricity from a RE Project may be determined in deviation from the norms specified in these Regulations, subject to the condition that the levelised tariff over the

useful life of the Project arrived at thereby does not exceed that computed on the basis of the specified norms:

Provided that the reasons for deviation from the norms specified under these Regulations shall be recorded in writing.

79. Power to Relax

The Commission may, by general or specific Order, for reasons to be recorded in writing and after giving an opportunity of hearing to the parties likely to be affected, relax any of the provisions of these Regulations on its own motion or on an application made before it by an interested person.

80. Issue of Order and Practice Directions

Subject to the provisions of the Act, the Commission may from time to time issue Orders and Practice Directions with regard to the implementation of these Regulations.

81. Power to Amend

The Commission may, at any time, vary, alter, modify or amend any provisions of these Regulations.

82. Power to remove difficulties

If any difficulty arises in giving effect to the provisions of these Regulations, the Commission may, by general or specific Order, make such provisions, not inconsistent with the provisions of the Act, as may appear to be necessary for removing the difficulty.

ANNEXURE A

Form-1.1

Form for Wind Power, Small Hydro and Solar PV/Solar Thermal Power Projects:

Parameter Assumptions

Form 1.1 Assumptions Parameters					
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	
1	Power Generation				
		Capacity			
			Installed Power Generation Capacity	MW	
			Capacity Utilization Factor	%	
			Useful Life	Years	
2	Project Cost				
		Capital Cost/MW	Power Plant Cost	Rs Lakh/MW	
3	Sources of Fund				
			Tariff Period	Years	
		Debt: Equity			
			Debt	%	
			Equity	%	
			Total Debt Amount	Rs Lakh	
			Total Equity Amout	Rs Lakh	
		Debt Component			
			Loan Amount	Rs Lakh	
			Repayment Period(incld Moratorium)	years	
			Interest Rate	%	
		Equity Component			
			Equity amount	Rs Lakh	
			Return on Equity for first 10 years	% p.a	
			RoE Period	Year	
			Return on Equity 11th year onwards	% p.a	
				%	
			Discount Rate (equv to WACC)	%	
4	Financial Assumptions				
		Fiscal Assumptions			
			Income Tax	%	
			MAT Rate (for first 10 years)	%	
		Depreciation			
			Depreciation Rate for first 12 years	%	
			Depreciation Rate 13th year onwards	%	
			Years for 5.83% rate		
5	Working Capital				
		For Fixed Charges			
		O&M Charges		Months	
		Maintenance Spare	(% of O&M exepenses)	%	
		Receivables for Debtors		Months	
		Interest On Working Capital		%	
6	Operation & Maintenance				
		power plant (FY15-16)		Rs Lakh	
		Total O & M Expenses Escalation		%	

ANNEXURE A

Form 1.2-

Form for Wind Power, Small Hydro and Solar PV/Solar Thermal Power Projects)

Determination of Tariff Components

Units Generation	Unit	Year--->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW																										
Gross/Net Generation	MU																										

Fixed Cost	Unit	Year--->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh																										
Depreciation	Rs Lakh																										
Interest on term loan	Rs Lakh																										
Interest on working Capital	Rs Lakh																										
Return on Equity	Rs Lakh																										
Total Fixed Cost	**Rs Lakh**																										
Per unit Fixed Cost	**Rs/kWh**																										

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit																										
O&M expn	Rs/kWh																										
Depreciation	Rs/kWh																										
Int. on term loan	Rs/kWh																										
Int. on working capital	Rs/kWh																										
RoE	Rs/kWh																										
Total COG	**Rs/kWh**																										
COG excl. RoE																											

Discount Factor																											
Fixed Cost																											
Levellised Tariff		Rs/Unit																									

Form 2.1 **ANNEXURE A**

Form for Biomass-based and Non-fossil Fuel-based Co-Generation Projects

Parameter Assumptions

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity			
			Installed Power Generation Capacity	MW	
			Auxillary Consumption during stablisation	%	
			Auxillary Consumption after stabilisation	%	
			PLF(Stablization for 6 months)	%	
			PLF(during first year after Stablization)	%	
			PLF(second year onwards)	%	
			Useful Life	Years	
2	Project Cost				
		Capital Cost/MW	Power Plant Cost	Rs Lakh/MW	
3	Financial Assumptions				
		Debt: Equity			
			Debt	%	
			Equity	%	
			Total Debt Amount	Rs Lakh	
			Total Equity Amout	Rs Lakh	
		Debt Component			
			Loan Amount	Rs Lakh	
			Repayment Period(incld Moratorium)	years	
			Interest Rate	%	
		Equity Component			
			Equity amount	Rs Lakh	
			Return on Equity for first 10 years	% p.a	
			RoE Period	Year	
			Return on Equity 11th years onwards	%	
			Discount Rate (equiv. to WACC)	%	
4	Financial Assumptions				
		Fiscal Assumptions			
			Income Tax	%	
			MAT Rate (for first 10 years)	%	
		Depreciation			
			Depreciation Rate for first 12 years	%	
			Depreciation Rate 13th year onwards	%	
			Years for 5.83% depreciation rate		
5	Working Capital				
		For Fixed Charges			
		O&M Charges		Months	
		Maintenance Spare	(% of O&M exepenses)		
		Receivables for Debtors		Months	
		For Variable Charges			
		Biomass Stock		Months	
		Interest On Working Capital		%	
6	Fuel Related Assumptions				
		Heat Rate	After Stabilisation period	Kcal/kwh	
		Biomass			
			Base Price(FY15-16)	Rs/T	
			GCV - Biomass	Kcal/kg	
7	Operation & Maintenance				
		power plant (FY 2015-16)		Rs Lakh	
		Total O & M Expenses Escalation		%	

ANNEXURE A

Form-2.2:

Form for Biomass and Non-fossil fuel-based Co-Generation Projects

Determination of Tariff Components

Units Generation	Unit	Year--->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW																					
Gross Generation	MU																					
Auxiliary Consumption	MU																					
Net Generation	MU																					

Vaiable Cost	Unit	Year--->																				
Biomass Cost	Rs Lakh																					
Per unit Var Cost	**Rs/kWh**																					

Fixed Cost	Unit	Year--->																				
O&M Expenses	Rs Lakh																					
Depreciation	Rs Lakh																					
Interest on term loan	Rs Lakh																					
Interest on working Capital	Rs Lakh																					
Return on Equity	Rs Lakh																					
Total Fixed Cost	**Rs Lakh**																					
Per unit Fixed Cost	**Rs/kWh**																					

Levallised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levellised																				
Variable COG	Rs/kWh																					
O&M expn	Rs/kWh																					
Depreciation	Rs/kWh																					
Int. on term loan	Rs/kWh																					
Int. on working capital	Rs/kWh																					
RoE	Rs/kWh																					
Total COG	**Rs/kWh**																					

Levellised Tariff	Unit	Year -->																				
Discount Factor																						
Variable Cost																						
Fixed Cost																						

Levellised Tariff (Variable)	
Levellised Tariff (Fixed)	
Levellised Tariff (Rs/Unit)	

ANNEXURE B

Format of Monthly Statements to be submitted by Biomass and Co-Generation Project Entities to State Nodal Agency

Template 1.1: Monthly Fuel Usage Statement

Name of the Project — For FY :
(Location, District) — Statement Date:
SNA / Utility Ref.No. — Project Code:
Installed Capacity (MW)
Date of Commissioning

Sr. No.	Month	Biomass Fuel-1 consumption (in Tonnes)			Biomass Fuel-2 consumption (in Tonnes)			Biomass Fuel-3 consumption (in Tonnes)			Fossil Fuel (Coal) consumption (in Tonnes)			% Fossil Fuel Consumption of Total Fuel Consumption	
		Type of fuel	During current month	Cumulative last 12 month	Type of fuel	During current month	Cumulative last 12 month	Type of fuel	During current month	Cumulative last 12 month	Grade of coal used	During current month	Cumulative last 12 month	During current month	Cumulative last 12 month
														(13)/(4+7+10 +13)	(14)/(5+8+11 +14)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	April														
2	May														
3	June														
4	July														
5	August														
6	September														
7	October														
8	November														
9	December														
10	January														
11	February														
12	March														

ANNEXURE B

Format of Monthly Statements to be submitted by Biomass and Co-Generation Project Entities to State Nodal Agency

Template 1.2: Monthly Fuel Usage Statement

Name of the Project — For FY :
(Location, District) — Statement Date:
SNA / Utility Ref. No. — Project Code:
Installed Capacity (MW)
Date of Commissioning

Sr. No.	Month	Energy Generation (kWh) during month		Cummulative Energy Generation (kWh) during FY till end of the month		Biomass Fuel-1 consumption (in Tonnes)			Biomass Fuel-2 consumption (in Tonnes)			Biomass Fuel-3 consumption (in Tonnes)			Fossil Fuel (Coal) consumption (in Tonnes)			% Fossil Fuel Consumption of Total Fuel Consumption	
						Type of fuel	During current month	Cumulative last 12 month	Type of fuel	During current month	Cumulative last 12 month	Type of fuel	During current month	Cumulative last 12 month	Grade of coal used	During current month	Cumulative last 12 month	During current month	Cumulative last 12 month
		Gross	Net	Gross	Net													(13)/(4+7+10+13)	(14)/(5+8+11+14)
1	2					3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	April																		
2	May																		
3	June																		
4	July																		
5	August																		
6	September																		
7	October																		
8	November																		
9	December																		
10	January																		
11	February																		
12	March																		

ANNEXURE B

Monthly Update

Template 2.1: Monthly Fuel Procurement Statement (1/2)

Name of the Project ***For FY :***

(Location, District) ***Statement Date:***

MEDA / Utility Ref.No. ***Project Code:***

Installed Capacity (MW)

Date of Commissioning

Sr. No.	Month	Quantity of Fuel Procured (in tonnes)				Total Delivered cost of Fuel (in Rs Lakh)			
		Biomass Fuel -1	Biomass Fuel -2	Biomass Fuel -3	Fossile Fuel -4	Biomass Fuel -1	Biomass Fuel -2	Biomass Fuel -3	Fossile Fuel -4
1	2	3	4	5	6	7	8	9	10
1	April								
2	May								
3	June								
4	July								
5	August								
6	September								
7	October								
8	November								
9	December								
10	January								
11	February								
12	March								

ANNEXURE B

Template 2.2: Monthly Fuel Procurement Statement

Monthly Update

Name of the Project
(Location, District)
SNA / Utility Ref.No.
Installed Capacity (MW)
Date of Commissioning

For FY :
Statement Date:
Project Code:

Sr.	Month	Biomass Fuel-1 Procured					Biomass Fuel-2 Procured					Biomass Fuel-3 Procured					Fossile Fuel (Coal) Procured				
		Cost to supplier Rs./Ton	Storage cost Rs./Ton	Handling cost Rs./Ton	Transportation cost Rs./Ton	Delivered cost of fuel Rs./Ton	Cost to supplier Rs./Ton	Storage cost Rs./Ton	Handling cost Rs./Ton	Transportation cost Rs./Ton	Delivered cost of fuel Rs./Ton	Cost to supplier Rs./Ton	Storage cost Rs./Ton	Handling cost Rs./Ton	Transportation cost Rs./Ton	Delivered cost of fuel Rs./Ton	Cost to supplier Rs./Ton	Storage cost Rs./Ton	Handling cost Rs./Ton	Transportation cost Rs./Ton	Delivered cost of fuel Rs./Ton
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	April																				
2	May																				
3	June																				
4	July																				
5	August																				
6	September																				
7	October																				
8	November																				
9	December																				
10	January																				
11	February																				
12	March																				

ASHWANI KUMAR,
Secretary,
Maharashtra Electricity Regulatory Commission.

Mumbai,
Dated 10th November 2015.

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