Chhattisgarh State Electricity Regulatory Commission
Irrigation Colony, Shanti Nagar,

Raipur, Dated: 10th August 2022

Chhattisgarh State Electricity Regulatory Commission (Terms and conditions for determination of generation tariff and related matters for electricity generated by plants based on renewable energy sources) Regulations, 2022

No. D6/CSERC/2022 - Govt. of India is giving thrust to develop renewable source of energy being environment friendly in nature. Also the Electricity Act 2003 provides for policy formulation by the Government of India and mandates State Electricity Regulatory Commissions (SERCs) to take steps to promote renewable sources of energy within their area of jurisdiction.

The Central Commission (CERC) has notified the Central Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources), Regulations, 2020 under which tariff determination aspects for various renewable energy technologies including biogas-based power project, municipal waste to energy (municipal solid waste and refused derived fuel), have been discussed. Although these Regulations are applicable for central sector and inter-State generation projects, under Section 61 of EA 2003, however these can be considered as guiding factor for SERCs while dealing with matters related to energy generation from RE sources.

Centre of Wind Energy Technology (CWET)/ National Institute of Wind Energy (NIWE) along with CREDA has identified few wind energy potential sites in the Chhattisgarh State, wherein wind energy potential can be harnessed for power generation, which needs suitable considerations to attract the investors in this sector.

India is aiming to have Net Zero Emission by 2070. In the recent COP-26 Summit at Glasgow, India has upped its target of electricity from non-fossil fuel based sources to 500 GW by 2030 and thus, about 50% of total energy consumed by 2030 is expected to come from renewable sources. As India prepares for the energy transition from fossil fuel to non-fossil fuel based energy systems and aims to achieve the reduction in GHG/CO2 emission by 1 billion tones by 2030, India will need to promote installation of 500 GW of non-fossil fuel capacity, out of which 450 MW will come from renewable energy. Keeping these commitments in mind, Central Govt have been launching various schemes and mechanism to promote bundling of cheaper renewable energy with costlier thermal power, promote energy transition and enable the beneficiary DISCOM achieve RPO at least costs.

Keeping the above in view and in exercise of powers vested under section 61, 86 read with Section 181 of the Electricity Act 2003 (36 of 2003) and all other powers enabling it in this behalf, the Chhattisgarh State Electricity Regulatory Commission (the Commission) hereby makes the following Regulations specifying the terms and conditions of tariff for renewable energy sources for the purpose of sale of power to distribution licensees.

1. Short title and commencement

1.1 These Regulations may be called the Chhattisgarh State Electricity Regulatory Commission (Terms and conditions for determination of generation tariff and related matters for electricity generated by plants based renewable energy sources) Regulations, 2022.

1.2 These Regulations shall come into force from April01, 2022 and shall remain in force for a period of 3 years from the date of commencement.

1.3 These Regulations shall extend to the whole of the State of Chhattisgarh and shall be applicable to renewable energy based generating stations established in the State.

2. Definitions and Interpretation

2.1 In these Regulations, unless the context otherwise requires:

a) **"Act"** means the Electricity Act, 2003 (36 of 2003), as amended from time to time;

b) **"Auxiliary Energy Consumption"** or 'AUX' in relation to a period in case of a generating station means the quantum of energy consumed by auxiliary equipments 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, combined or separately of the generating station.

c) **"Biogas"** means a gas produced when organic matter like crop residues, sewage, cattle dung, poultry waste and manure breaks down (ferments) in an oxygen-free environment;

d) **"Biomass"** means wastes produced during agricultural and forestry operations (for example straws and stalks) or produced as a by-product of processing operations of agricultural produce (e.g., 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 or as specified by Ministry of New and Renewable Energy from time to time.

e) **"Capacity Utilization Factor"** or **"CUF"** or **"Plant Load Factor"** or **"PLF"** for a given period, means the total electricity corresponding to actual generation (gross generation) during the reference period, expressed as a percentage of gross generation electricity corresponding to installed capacity in that reference period and shall be computed in accordance with the following formula;

$$\textbf{CUF} = \frac{\textbf{Gross generation over the reference period} \times 100\%}{\textbf{Installed capacity x total hours during the reference period (including outage hours)}}$$

f) **"Capital Cost"** means as defined in the regulation 12, 25, 28, 34, 46, 54, 59 ,65 and 74 for the respective renewable energy source.

g) **"CERC"** means the Central Electricity Regulatory Commission;

h) **"Commission"** means the Chhattisgarh State Electricity Regulatory Commission;

i) **"Commissioning"** means testing and operation of systems and components of generating plant as may be required for successful synchronization of the

generating plant. A commissioning process may be applied not only to new projects but also to existing units and systems subjected to expansion, renovation or revamping.

j) **"Cutoff Date"** means 31st March of the year closing after one year of the year of commercial operation of the project, and in case the project is declared under commercial operation in the last quarter of a year, the cut-off date shall be 31st March of the year closing after one years of the year of commercial operation;

k) **Control Period** or **Review Period** means the period during which the norms for determination of tariff specified in these regulations shall remain valid;

l) **"Date of Commercial Operation"** or **"COD"** means

(i) in relation to a generating unit means the date declared by the generator after demonstrating the maximum continuous rating (MCR) or installed capacity (IC) at designed condition (after considering deviations in uncontrollable parameters) through a successful trial run, after notice to the beneficiary.

(ii) in relation to the generating station means the date of commercial operation of the last unit or block of the generating station in accordance with the clause (i) above;

m) **"Financial Year"** means a period commencing on 1st day of April of a calendar year and ending on 31st March of the subsequent calendar year;

n) "**Firm Power**" means any electricity supplied from and after the COD of project;

o) **"Gross Calorific Value"** or **'GCV'** in relation to a fuel used in generating station means the heat produced in KCal by complete combustion of one kilogram of solid fuel or one lit of liquid fuel or one standard cubic meter of gaseous fuel, as the case may be;

p) **"Gross Station Heat Rate"** or **"GSHR"** means the heat energy input in kCal required to generate one kWh of electrical energy at generator terminals;

q) **Hybrid Solar Thermal Power Plants** means the solar thermal power plant that uses other forms of renewable energy input sources along-with solar thermal energy for electricity generation, and wherein not less than 75% of electricity is generated from solar energy component.

r) **"Infirm Power"** means electricity generated prior to declaration of date of commercial operation of generating station/ unit;

s) **"Installed Capacity"** or **"IC"** means the summation of the name plate capacities of all the units of the generating station or the capacity of the generating station (reckoned / tested at the generator terminals), as approved by the Commission from time to time;

t) **Inter-connection Point**

'Inter-connection Point' shall mean interface point of renewable energy generating facility with the transmission system or distribution system, as the case may be:

i. in relation to wind energy projects and solar photovoltaic Projects, inter-connection point shall be line isolator on outgoing feeder on HV side of the pooling sub-station;

ii. in relation to small hydro power, biomass power and non fossil fuel based

cogeneration power projects and solar thermal Power Projects the, inter-connection point shall be line isolator on outgoing feeder on HV side of generator transformer;

u) **"Licensee"** means a distribution licensee operating in the State;

v) **"MNRE"** means the Ministry of New & Renewable Energy of Government of India;

w) **"Maximum Continuous Rating"** or **"MCR"** in relation to a unit of the thermal generating station based on renewable energy source means the maximum continuous output at the generator terminals, guaranteed by the manufacturer at rated parameters;

x) **Municipal Solid Waste (MSW)** means and includes commercial and residential wastes generated in a municipal or notified areas in either solid or semi-solid form excluding industrial hazardous wastes but including treated bio-medical wastes."

y) **'Mini/Micro Hydro'** means Hydro Power projects with a station capacity up to 100 kW for micro hydro power plants and from 101 kW & up to 2 MW for mini hydro;

z) **"Non-firm power"** means the power generated from renewable sources, the hourly variation of which is dependent upon nature's phenomenon like sun, cloud, wind, etc., that cannot be accurately predicted

aa) **"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 provided the project may qualify to be a co-generation project if it fulfils the eligibility criteria as specified in Regulation 4.4;

bb) **"Project/Plant"** means a generating station including the evacuation system upto inter-connection point, and in case of a small hydro generating station includes all components of generating facility such as dam, intake water conductor system, power generating station and generating units of the scheme, as the case may be, as apportioned to power generation;

cc) **"Refuse Derived Fuel (RDF)"** means segregated combustible fraction of solid waste other than chlorinated plastics in the form of pellets or fluff produced by drying, de-stoning, shredding, dehydrating and compacting combustible components of solid waste that can be used as fuels;

dd) **"Renewable Energy Power Plants"** means the power plants other than the conventional power plants generating grid quality electricity from renewable energy sources as approved by MNRE;

ee) **"Renewable Energy Sources"** means renewable sources such as hydro, wind, solar including its integration with combined cycle, biomass, bio fuel cogeneration, urban or municipal waste and other such sources as approved by the MNRE;

ff) **"Scheduled Generation"** at any time or for any period or time block means schedule of generation in MW or MU at inter-connection point as agreed by the generator and licensee;

gg) **"Small hydro project"** means a hydro power project with a installed capacity of above 2 MW and upto 25 MW (including 25 MW) or as defined by the

Government of India, from time to time at a single location;

hh) **"Solar PV power"** means the Solar Photo Voltaic power project that uses sunlight for direct conversion into electricity through Photo Voltaic technology;

ii) **"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;

jj) **"State"** means the State of Chhattisgarh;

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

ll) **"Useful Life"** in relation to a unit of a generating station including evacuation system shall mean the following duration from the date of commercial operation of such generation facility, namely;

I.	Wind energy power project	25 years
II.	Small Hydro Plant	40 years
III.	Biomass power project	25 years
IV.	Non-fossil fuel cogeneration	25 years
V.	Solar PV/Solar thermal power plants	25 years
VI.	MSW and RDF based power project	25 years
VII.	Biogas based power project	25 years

mm) **"Year"** means a financial year;

2.2 Words and expressions used in these Regulations and not defined shall have the same meaning as they have in the Act and in the other Regulations made by the Commission.

3. Scope and extent of application

3.1 New Projects:

I. These Regulations shall apply to the Renewable Energy projects, achieving COD from April 01, 2022 to March 31, 2025 (herein after referred to as "RE projects"), located in the State and supplying entire power to distribution licensee(s) of the State on long term basis.

II. These Regulations shall also apply to those RE projects which fulfil the eligibility criteria specified in regulation 4.

3.2 Existing Projects:

I. For existing biomass projects, which have achieved COD before April 01, 2012 and have long term PPA with distribution licensee for 20 years or more, the applicable tariff i.e., fixed charges, shall be governed by the Commission's order in Petition No 22 of 2011(T) and energy charges will be determined as per provisions in these regulations.

II. Existing RE projects having long term PPA with distribution licensee of 20 years or more, which have achieved COD between April 01, 2012 to March 31, 2022, applicable tariff (fixed charges) shall be governed by respective Tariff Orders as

issued from time to time by the Commission for the duration of the Tariff Period whereas energy charges will be determined as per provisions in these regulations.

4. Eligibility Criteria

Following projects achieving COD after April 01, 2022 shall be eligible under these regulations:

4.1 Wind power project – New wind power project(s) using new plant and machinery.

4.2 Hydro project –

I. New Mini/Micro/Small hydro project(s) located at the sites approved by State Nodal Agency/ State Government using new plant and machinery.

II. Large Hydro Projects (LHP) above 25 MW.

4.3 Biomass power project based on Rankine cycle technology – New biomass power project(s) using new plant and machinery based on Rankine cycle technology and using biomass fuel sources.

Provided, that use of fossil fuel shall be restricted to stipulation under Regulation 40 of these Regulations.

4.4 Non-fossil fuel based co-generation project - New non-fossil fuel based co-generation project(s) shall qualify to be termed as a non-fossil fuel based co-generation project, if it is using new plant and machinery and is in accordance with the definition.

4.5 Solar PV, Solar Thermal Power Projects, Solar rooftop PV systems and small Solar power projects – Projects based on Technologies approved by MNRE.

4.6 Municipal solid waste (MSW) based power projects – The project shall qualify to be termed as a Municipal solid waste based power project, if it is using new plant and machinery based on Rankine cycle technology and using Municipal solid waste as fuel sources.

4.7 Refuse derived fuel (RDF) based power projects – The project shall qualify to be termed as a Refuse derived fuel based power project, if it is using new plant and machinery based on Rankine cycle technology and using Refuse derived fuel as fuel sources.

4.8 Biogas based power project – The project uses new plant and machinery and has a grid connected system that uses 100% biogas fired engine, coupled with biogas technology for co-digesting agriculture residues, cow dung, poultry waste, manure and other bio-waste as approved by MNRE.

Chapter 1: General Principals

5. Control Period or review Period

5.1 The Control Period or Review Period under these Regulations shall be of three years. First year of the Control Period shall commence from the April 01, 2022.

Provided that the tariff determined as per these Regulations for the RE projects commissioned during the Control Period, shall continue to be applicable for the entire duration of the Tariff Period as specified in Regulation 6 below.

Provided also that the Regulations for next Control Period shall be undertaken six months prior to the end of the first Control Period and in case Regulations for the next Control Period are not notified until commencement of next Control Period, the tariff norms as per these Regulations shall continue to remain in force until notification of the revised Regulations subject to adjustments as per revised Regulations.

6. Tariff Period

6.1 The Tariff Period for new Renewable Energy power projects will be same as their Useful Life as defined in Regulation 2 (1) (ll).

6.2 Tariff Period under these Regulations shall be considered from the date of commercial operation of the renewable energy generating stations.

6.3 Tariff determined as per these Regulations shall be applicable for Renewable Energy power projects, for the duration of the Tariff Period as stipulated under Clause (6.1) and (6.2).

7. Generic Tariff

7.1 The Commission shall determine the generic preferential tariff in case of Small Hydro, Solar PV power project for 0.5 MW to 2 MW capacity, Biogas based power project and Co-generation power projects, at the beginning of each year of the Control period.

7.2 In case of delay in determination of generic tariff, the CERC tariff for the respective year shall be the provisional tariff. The difference will be adjusted accordingly.

8. Project Specific Tariff

8.1 Project specific tariff, on case to case basis, shall be determined by the Commission for the following types of projects:

i. Wind energy
ii. Hydro power plant of above 25 MW capacity
iii. Pumped storage hydro power plants
iv. Solar thermal
v. Municipal Solid Waste and Refuse Derived Fuel based projects with Rankine cycle technology
vi. Any other new renewable energy technologies approved by MNRE apart from those identified in these Regulations
vii. Hybrid Solar Thermal Power plants
viii. Biomass projects
ix. Solar PV power project for above 2 MW
x. Any generating unit/ station, commissioned by using old plant and machinery.
xi. Any project if the licensee/developer desires for the project specific tariff

8.2 Determination of Project specific tariff for generation of electricity from such renewable energy sources shall be in accordance with terms and conditions as stipulated under relevant provisions of the regulations/orders.

Provided that norms for project-specific tariff for Hydro power plants above 25 MW capacity, shall be in accordance with applicable CSERC MYT Regulations during the control period.

8.3 Further, in case of projects which have been awarded provisional tariff before commencement of these regulations and who opt for generic tariff, payments already made to developers towards provisional tariff shall be adjusted in six equal monthly instalments after deducting the statutory charges paid to State Government.

If such project opts for project specific tariff then such revenue earned shall be set off against the capital cost incurred on the project.

8.4 The norms as specified under Chapter-2 of these Regulations, except for capital cost for the respective year of project commissioning, shall be ceiling norms.

8.5 In case of biomass projects/co-generation/biogas based power project and other projects having fuel cost component, rate of infirm power shall be equal to energy (variable) charges. For other projects which do not have fuel cost component, rate of infirm power shall be equal to the statutory charges such as water charges, duty and cess actually paid to State Government. Such infirm power shall qualify for renewable purchase obligations requirement of the licensee.

8.6 Petition and proceedings for determination of tariff

The Commission shall determine the generic tariff on the basis of suo-motu petition preferably at the beginning of each year of the Control period for renewable energy technologies for which norms have been specified under the Regulations.

8.7 A petition for determination of project specific tariff shall be accompanied by such fee as may be determined by relevant Regulations and shall be accompanied by

i. Information in Forms 1.1, 1.2, 2.1 and 2.2 as the case may be, and as appended in these Regulations;

ii. Detailed project report outlining technical and operational details, site specific aspects, premise for capital cost and financing plan, etc;

Provided that for the existing RE plants, the previous tariff order shall form the basis for capital cost and financing.

iii. Certified copy from the practising Charter Accountant / Cost Auditor as proof of capital cost incurred towards Gross fixed Asset (GFA) clearly indicating sources of funds, debt, equity & subsidies /if any;

iv. A Statement of all applicable terms and conditions and expected expenditure for the period for which tariff is to be determined;

v. A statement containing full details of calculation of any subsidy and incentive received, due or assumed to be due from the Central Government and/or State Government. This statement shall also include the proposed tariff calculated without consideration of the subsidy and incentive;

vi. Any other information that the Commission requires the Petitioner to submit for disposal of the petition;

vii. Technical data including data regarding CUF.

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

8.9 Project specific tariff shall be determined for the useful life of the project and shall be levellised tariff.

9. Tariff Structure

9.1 The tariff for renewable energy technologies shall be single-part tariff consisting of the following fixed cost components:

I. Return on equity;
II. Interest on loan capital;
III. Depreciation;
IV. Interest on working capital;
V. Operation and maintenance expenses;

Provided that for renewable energy technologies having fuel cost component, like biomass power projects, biogas based power project and non-fossil fuel based co-generation projects, single-part tariff with two components, viz., fixed cost component and fuel cost component, shall be determined.

10. Tariff Design

10.1 The generic tariff shall be determined considering the year of COD of the project, on levellised basis for the Tariff period.

Provided that for renewable energy technologies having tariff with two components, tariff shall be determined on levellised basis considering the year of COD of the project for fixed cost component while the fuel cost component shall be specified on year of operation basis.

10.2 For the purpose of levellised tariff computation, the discount factor equivalent to Post Tax weighted average cost of capital shall be considered.

10.3 Levellisation shall be carried out for the 'useful life' of the renewable energy project.

Provided that for existing RE plants as specified in Regulation 3.2(I) and plants for which project specific tariff has been determined, no levellisation of tariff will be carried out and tariff will be specified for five years.

10.4 In case of solar, wind and small hydro projects which are nature dependent, any excess generation over and above normative CUF/PLF on annualized basis or the energy specified in the PPA, as the case may be, shall be purchased at 75% of the applicable tariff.

11. Dispatch Principles for electricity generation from Renewable Energy Sources

11.1 All renewable energy power plants shall be treated as ‘MUST RUN’ power plants and shall not be subjected to ‘merit order despatch’ principles.

11.2 Notwithstanding anything contained in any regulation framed under the Electricity Act 2003, all renewable energy power plants except biomass power generating station, biogas based power project and non-fossil fuel based co-generation projects shall not be subjected to scheduling and deviation settlement.

Provided that in case of supply of power to multiple beneficiaries within the State, scheduling and deviation settlement shall be applicable.

Chapter 2: Financial Principals

12. Capital Cost

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

Provided that for project specific tariff determination, the generating company shall submit the break-up of capital cost items along with its petition in the manner specified under Regulation 8.

12.2 Capital cost for RE projects as specified for first year of control period shall remain valid for the entire duration of the control period unless reviewed by the Commission.

13. Debt Equity Ratio

13.1 For suo-motu determination of generic tariff, the debt equity ratio shall be considered as 70:30.

13.2 For project specific tariff, if the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan.

Provided that where 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 debt/equity invested in foreign currency shall be denominated/ designated in Indian rupees on the date of each investment.

14. Loan and Finance Charges

14.1 For the purpose of determination of tariff, loan tenure of 15 years shall be considered.

14.2 The loans arrived at in the manner indicated above shall be considered as gross normative loan for calculation of interest on loan. The normative loan outstanding as on April 1st of every year shall be worked out by deducting the cumulative repayment up to March 31st of previous year from the gross normative loan.

14.3 For the purpose of computation of tariff, the normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one year tenor) prevalent during the last available six months shall be considered.

14.4 Notwithstanding any moratorium period availed by the generating company, 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.

Provided that the existing biomass plants having power purchase agreement (PPA) with State DISCOM for which the Commission have determined preferential tariff opt for the project specific tariff, loan and finance charges will be considered as specified in the relevant orders.

15. Depreciation

15.1 The value base for the purpose of depreciation shall be the Capital Cost of the asset admitted by the Commission. 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.

15.2 The depreciation rate for the first 15 years of the Tariff Period shall be 4.67% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 16th year onwards on 'Straight Line Method'.

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

Provided that for determination of project specific tariff, in case of commercial operation of the project for part of the year, depreciation shall be computed on *pro rata* basis.

16. Return on Equity

16.1 The value base for the equity shall be 30% of the capital cost or actual equity (in case of project specific tariff determination) as determined under Regulation 13.

16.2 The normative Return on Equity shall be 14%, to be grossed up by prevailing Minimum Alternate Tax (MAT) as on 1st April of previous year for the entire useful life of the project.

Provided that the existing biomass plants having power purchase agreement (PPA) with State DISCOM for which the Commission have determined preferential tariff opt for the project specific tariff or the beneficiary/licensee opt for project specific tariff, return on equity will be considered as specified in the relevant orders read with provisions specified in Regulation 3 of these Regulations.

17. Interest on Working Capital

17.1 The Working Capital requirement in respect of wind energy projects, small hydro power, solar PV and Solar thermal power projects shall be computed as per following:

I. Operation & Maintenance expenses for one month;
II. Receivables equivalent to 45 days of energy charges for sale of electricity calculated on the normative CUF;
III. Maintenance spare @ 15% of operation and maintenance expenses

The Working Capital requirement in respect of biomass power projects, biogas based power project, non-fossil fuel based co-generation projects, Municipal Solid Waste and Refuse Derived Fuel projects shall be computed as per following:

I. Fuel costs for four months equivalent to normative PLF;
II. Operation & Maintenance expense for one month;
III. Receivables equivalent to 45 days of fixed and variable charges for sale of electricity calculated on the target PLF;
IV. Maintenance spare @ 15% of operation and maintenance expenses

17.2 Interest on Working Capital shall be at interest rate equivalent to the normative interest rate of three hundred fifty (350) basis points above the average State Bank of India MCLR (One Year Tenor) prevalent during the last available six months for the determination of tariff.

18. Operation & Maintenance Expenses

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

18.2 O&M expenses shall be determined for the Tariff Period based on normative O&M expenses specified by the Commission subsequently in these Regulations for the first Year of Control Period.

18.3 Normative O&M expenses allowed during first year of the control Period (i.e. FY 2022-23) under these Regulations shall be escalated at the rate of 3.84% per annum over the Tariff Period.

19. Rebate

19.1 For payment of bills of the generating company through letter of credit, a rebate of 2% shall be allowed.

19.2 Where payments are made other than through letter of credit within a period of one month of presentation of bills by the generating company, a rebate of 1% shall be allowed.

20. Late payment surcharge

20.1 In case the payment of any bill for charges payable under these regulations is delayed beyond a period of 45 days from the date of billing, a late payment surcharge at the rate of 1.25% per month shall be levied by the generating company.

21. Norms of Operation and Parameters to be Ceiling Norms:

21.1 Norms and parameters specified in these regulations are the ceiling norms and shall not preclude the project developer or the beneficiary from agreeing to the improved norms of operation and in case the improved norms are agreed to, such improved norms/parameters shall be applicable for determination of project specific tariff.

22. Subsidy or incentive by the Central/State Government

22.1 The Commission shall take into consideration any capital subsidy/ incentive/grant offered by the Central or State Government, including accelerated depreciation benefit if availed by the generating company, for the renewable energy power plants while determining the project specific tariff under these Regulations.
Provided further that in case any Central Government or State Government notification specifically provides for any Generation based Incentive over and above tariff, the same shall not be factored in while determining Tariff.

23. Cess, Duties and Water charges/statutory charges

23.1 Tariff determined under these regulations shall be exclusive of cess and duties on generation, auxiliary consumption and sale of electricity as may be levied by the appropriate Government.

Provided that the cess and duties levied by the appropriate Government shall be allowed as pass through on actual incurred basis.

In case of hydro projects, water charges as levied by the State Government shall not be included in the tariff. It is to be paid separately and shall be pass through on actual incurred basis.

24. Sharing of CDM Benefits

24.1 The projects for which the Commission has determined project specific tariff, the proceeds of carbon credit from approved CDM project shall be shared between generating company and concerned beneficiaries in the following manner, namely

- 100% of the gross proceeds on account of CDM benefit to be retained by the project developer in the first year after the date of commercial operation of the generating station;
- In the second year, the share of the beneficiaries shall be 10% which shall be progressively increased by 10% every year till it reaches 50%, where after the proceeds shall be shared in equal proportion, by the generating company and the beneficiaries.

Chapter 3: Technology specific parameters for Wind energy Projects

25. Capital Cost

25.1 The capital cost for wind energy project shall include 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 IDC.

25.2 The Commission shall determine only project specific tariff and capital cost shall be based on prevailing market trends for wind energy project.

26. Capacity Utilisation Factor (CUF)

26.1 CUF norms for this control period shall be as follows;

Annual Mean Wind Power Density (W/M^2)	**CUF**
Upto 220	22%
221-275	24%
276-330	28%
331-440	33%
>440	35%

26.2 The annual mean wind power density specified in Regulation 26.1 above shall be measured at 100 meter hub-height.

26.3 For the purpose of classification of wind energy project into particular wind zone class, as per MNRE guidelines for wind measurement, wind mast either put-up by NIWE or a private developer and validated by NIWE would be normally extended 10 km from the mast-point to all directions for uniform terrain and limited to appropriate distant in complex terrain with regard to complexity of the site. Based on such validation by NIWE, State Nodal Agency should certify zoning of the proposed wind farm complex.

27. Operation and Maintenance Expenses

27.1 The Commission shall determine only Project Specific O&M Expenses based on the prevailing market information.

Chapter 4: Technology specific parameters for Small Hydro Projects

28. Capital Cost

28.1 The normative capital cost for hydro projects during first year of the control period (i.e. year 2022-23) shall be as follows;

Project Size	Capital Cost (Rs. Lakh/MW)
up to 5 MW	780
above 5 MW to 25 MW	900

This also includes the cost of laying of distribution/transmission lines for evacuation of power.

28.2 Capital cost for Small Hydro Plants, achieved COD before April 01, 2012 will be governed through respective approved Orders of the Commission.

29. Capacity Utilisation Factor (CUF)

29.1 For determination of generic tariff, capacity utilisation factor for hydro projects shall be 30%. For project specific tariff, CUF shall be determined by the Commission on case to case basis.

30. Auxiliary Consumption

30.1 Normative Auxiliary Consumption for the hydro projects shall be 1.5%.

31. Operation & Maintenance Expenses

31.1 Normative O&M expenses for the first year of the control period (i.e. FY 2022-23) shall be as follows:

Project Size	O&M Expense (Rs. Lakh/MW)
up to 5 MW	37.61
Above 5 MW up to 10 MW	32.98
Above 10 MW up to 25 MW	27.24

31.2 Normative O&M expenses allowed under these Regulations shall be escalated at the rate of 3.84% per annum for the Tariff Period for the purpose of determination of tariff.

32. Tariff for Mini/Micro Hydro Projects

32.1 Tariff for Mini/Micro Hydro Projects shall be higher by Rs 0.50/kWh or such other higher amount as may be stipulated by Commission from time to time over and above the generic tariff applicable for Hydro Projects as decided by the Commission. However this will not be applicable for the developers/licensee opts for project specific tariff and on canal based projects.

Chapter 5: Technology specific parameters for Biomass Power Projects based on Rankine Cycle Technology

33. Technology Aspect

33.1 The norms for tariff determination specified hereunder are for biomass power projects based on Rankine cycle technology application using water cooled condenser.

34. Capital Cost and Capital Cost Indexation Mechanism

34.1 The Commission shall determine only project specific capital cost and tariff based on prevailing market trends for biomass energy project.

35. Plant Load Factor

35.1 For the purpose of determination of tariff, the Plant Load Factor shall be considered as 80%.

36. Auxiliary Consumption

36.1 The auxiliary power consumption shall be considered as 10% for the determination of tariff.

37. Station Heat Rate

37.1 The station heat rate for the biomass power projects shall be 4000 kcal/kWh.

38. Operation and Maintenance Expenses

38.1 Normative O&M expenses for the first year of the control period (i.e. FY 2022-23) shall be Rs. 51.87 Lakh per MW.

38.2 Normative O&M expenses allowed at the commencement of the tariff Period shall be escalated at the rate of 3.84% per annum for the subsequent years of the control period.

39. Fuel

39.1 The biomass power plant shall be designed in such a way that it uses different types of non-fossil fuels available within the vicinity of biomass power project such as crop residues, agro-industrial residues, forest residues etc. and other biomass fuels as may be approved by MNRE.

39.2 The Biomass Power Generating Companies shall ensure fuel management plan to ensure adequate availability of fuel to meet the respective project requirements and submit to the beneficiary.

40. Use of Fossil Fuel – Fuel Mix

40.1 The use of fossil fuels shall not be allowed.

Provided that for the biomass power projects commissioned on or before 31.03.2022, the use of fossil fuels to the extent of 15% or as prescribed by MNRE in terms of calorific value on annual basis shall be allowed for the tariff period from the date of COD.

41. Monitoring Mechanism for the use of fossil/biomass fuel

41.1 The project developer shall furnish a monthly fuel procurement statement and monthly fuel usage statement duly certified by Chartered Accountant/Cost Accounted to the beneficiary, with complete details as may be required to the satisfaction of the beneficiary, with whom the power purchase agreement has been made (with a copy to appropriate agency i.e. CREDA appointed by the Commission for the purpose of monitoring the fossil and non-fossil fuel consumption) for each month, along with the monthly energy bill. The statement shall cover details such as –

i. Sources of fuel procurement

ii. Opening fuel stock quantity (in tonnes), for each type of fuel,

iii. Receipt of fuel quantity (in tonnes) at the power plant site for each type of fuel during the month,

iv. Quantity of fuel (in tonnes) for each fuel type (biomass fuels and fossil fuels) consumed during the month for power generation purposes,

v. Closing fuel stock quantity (in tonnes) for each fuel type (biomass fuels and fossil fuels) available at the power plant site at the end of the month,

vi. Cumulative quantity (in tonnes) of each fuel type (biomass and fossil fuel) procured till the end of that month during the financial year,

vii. Cumulative quantity (in tonnes) for each fuel type (biomass and fossil fuel) consumed till end of that month during the financial year),

viii. Actual (gross and net) energy generation (denominated in lakh of units) during the month,

ix. Cumulative actual (gross and net) energy generation (denominated in lakh of units) until the end of that month during the financial year,

41.2 In case designated agency is satisfied, that the generator has reached to a stage whereby compliance of the fuel mix criterion on annualised basis (financial year) is not possible, it will intimate to the concern beneficiaries and generators with details of such conclusions. Thereafter beneficiary shall issue notice to the generator with reasons and instead of paying the preferential tariff, shall deal with the issue in accordance to express provisions given in Regulations 41.3. Appropriate mechanism shall be incorporated in the power purchase agreement between the parties with due approval of the Commission for the compliance of fuel mix ration as prescribed by MNRE.

41.3 Non-compliance with the condition of fossil fuel usage by the project developer (achieved CoD before and after April 01, 2022), during any financial year, shall render such biomass power project to be ineligible to avail preferential tariff determined as per these Regulations in the year of default during such financial year when such default occurs. However, such defaulting Biomass Power Project shall continue to sell power to concern distribution licensee even during the period of default. The rate of supply to distribution licensee will be weighted average pooled price at which the distribution licensee has purchased the electricity including cost of self generation, if any, (in the defaulting year of biomass plant) from all the long-term and short-term energy suppliers, but excluding those based on renewable energy sources, as the case may be, for the entire year of default and additional payment arrived to such power project will be adjusted in future bills in six equal monthly instalments.

42. Power to require statistics & returns by Monitoring agency

42.1 The Chhattisgarh Renewable Energy Development Agency (CREDA) shall be responsible for monitoring compliance of fuel mix ratio of biomass projects.

42.2 CREDA shall also maintain such data, including technical and commercial details (including year of CoD, prescribed fuel mix ratio, source of fuel etc.) of biomass projects in the State and shall make the data available in the public domain by publishing the same on its website with quarterly updation.

42.3 The project developer shall submit the information to CREDA as required under Regulation 41 in the format as specified in schedule format 3.1 and 3.2.

42.4 CREDA shall submit an annual report on an affidavit duly notarised, for the entire financial year to the Commission for each biomass power plant (achieved CoD before and after April 01, 2012) on the use of fossil fuel and biomass fuel by the biomass based plant during the preceding year, by the end of April every year.

42.5 CREDA shall also submit the same annual report (as mentioned in Regulation 42.4) for the entire financial year to the beneficiary for each biomass power plant (achieved CoD before and after April 01, 2012) on the use of fossil fuel and biomass fuel by the biomass based plant during the preceding year, by the end of April every year. Non-compliance of the stipulation with regard to use of fossil fuel by any generating plant and use of such fuel in excess of the specified percentage during any financial year shall render the plant to be treated as any other thermal generator and all benefits given to such plants including tariff, as renewable energy source shall stand withdrawn. Beneficiary shall issue notice to such generators for non compliance with regard to usage of fossil fuel and instead of paying the preferential tariff, shall deal with the issue in accordance to express provisions given in Regulations 41.3.

Also project developer shall submit documents related to long term fuel supply arrangement to the beneficiary as well as to the CREDA.

43. Calorific Value

43.1 The average Calorific Value of the biomass fuel(s) used for the purpose of determination of tariff for biomass power projects shall be 3100 kcal/kg.

44. Fuel Cost

44.1 Biomass fuel price for the 1st year of the control period (i.e. FY 2022-23) shall be Rs. 3922 per MT.

44.2 Biomass fuel price shall be escalated at 5% to arrive at the base price for subsequent years of the Control Period.

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

45. Technology Aspect

45.1 A project shall qualify as a non-fossil fuel based co-generation project, if it is in accordance with the eligibility criteria as specified under Regulation 4.4.

46. Capital Cost

46.1 The normative capital cost for the non-fossil fuel based co-generation projects shall be considered as Rs. 492 Lakh/MW for the first year of the Control Period (i.e. FY 2022-23).

47. Capacity Utilization Factor

47.1 For the purpose of determining fixed charge, the plant load factor for non-fossil fuel based co-generation projects shall be computed on the basis of plant availability for number of operating days considering operations during crushing season and off-season as specified under Regulation 47.2 below and load factor of 92%.

47.2 The number of operating days shall be as follows:

Operating Days	Plant Load Factor (%)
90 days (crushing)+ 60 days (off-season) = 150 days operating days	38%

48. Auxiliary Consumption

48.1 The auxiliary power consumption shall be 8.5% for determination of tariff.

49. Station Heat Rate

49.1 The station heat rate of 3600 kcal/kWh for the power generation component alone shall be considered for computation of tariff for non-fossil fuel based co-generation projects.

50. Calorific Value

50.1 The Gross Calorific Value for bagasse shall be considered as 2250 kcal/kg. For the use of biomass fuels other than bagasse, calorific value as specified under Regulation 43 shall be applicable.

51. Fuel Cost

51.1 The price of bagasse shall be Rs. 2507 per MT during first year of the tariff Control Period (i.e. FY 2022-23) and thereafter shall be escalated to 5% for the base price for subsequent years during the control period.

51.2 For use of biomass other than bagasse in co-generation projects, the biomass prices as specified under Regulation 44 shall be applicable.

51.3 For the purpose of determining levellized tariff, a normative escalation factor of 5% per annum shall be applicable on bagasse prices.

52. Operation and Maintenance Expenses

52.1 Normative O&M expenses for the first year of the tariff period (i.e. FY 2022-23) shall be Rs. 27.40 Lakh per MW.

52.2 Normative O&M expenses allowed at the commencement of the tariff Period under these Regulations shall be escalated at the rate of 3.84% per annum.

Chapter 7: Technology specific parameters for Solar PV Power Projects

53. Technology Aspects

53.1 Norms for Solar Photovoltaic (PV) power under these Regulations shall be applicable grid connected PV systems that directly convert solar energy into electricity and are based on the technologies such as crystalline silicon or thin film etc. as may be approved by MNRE.

53.2 The Commission shall determine generic tariff for the solar PV plants of capacity 0.5 MW to 2 MW and project specific tariff for the solar PV plants of 2 MW capacity.

54. Capital Cost

54.1 The normative capital cost for setting up Solar Photovoltaic Power Project of capacity 0.5 MW to 2 MW shall be considered as Rs. 4.5 crore per MW for the first year of the control period (i.e. FY 2022-23).

54.2 Capital cost for Solar PV power projects, achieved COD before April 01, 2022 will be governed through respective approved Orders of the Commission till the currency of the Order.

55. Capacity Utilisation Factor

55.1 The Capacity utilisation factor for Solar PV project shall be 19%. Provided that the Commission may deviate from above norm in case of project specific tariff determination in pursuance of Regulation 7 and Regulation 8.

56. Operation and Maintenance Expenses

56.1 The O&M Expenses shall be Rs. 8.12 Lakh per MW for the 1st year of operation.

56.2 Normative O&M expenses allowed at the commencement of the tariff Period under these Regulations shall be escalated at the rate of 3.84% per annum.

57. Auxiliary Consumption

57.1 The auxiliary consumption factor shall be 0.25% of gross generation.

Provided that the Commission may deviate from the above norm in case of project specific tariff determination in pursuance of Regulation 7 and Regulation 8.

Chapter 8: Technology specific parameters for Solar Thermal Power Projects

58. Technology Aspects

58.1 Norms for Solar thermal power under these Regulations shall be applicable for Concentrated solar power (CSP) technologies viz. line focusing or point focusing, as may be approved by MNRE, and uses direct sunlight, concentrating it several times to reach higher energy densities and thus higher temperatures whereby the heat generated is used to operate a conventional power cycle to generate electricity.

59. Capital Cost

59.1 The Commission shall determine only project specific capital cost and tariff based on prevailing market trends for Solar Thermal project.

60. Capacity Utilisation Factor

60.1 The Capacity utilisation factor for Solar Thermal project shall be 23%. Provided that the Commission may deviate from the above norm in case of project specific tariff determination in pursuance of Regulation 7 and Regulation 8.

61. Operation and Maintenance Expenses

61.1 The Commission shall determine only project specific O&M expenses based on prevailing market trends for Solar Thermal project.

62. Auxiliary Consumption

62.1 The auxiliary consumption factor shall be 10%.
Provided that the Commission may deviate from the above norm in case of project specific tariff determination in pursuance of Regulation 7 and Regulation 8

63. Hybrid Solar Thermal Power Plants

63.1 The capital cost, auxiliary consumption factor, capacity utilization factor, O&M expenses and other relevant parameters for hybrid solar thermal power plants shall be decided by the Commission on case to case basis.

Chapter 9: Technology specific parameters for MSW and RDF Projects based on Rankine Cycle Technology

64. Technology Aspect

64.1 The norms for tariff determination specified hereunder are for power projects which use municipal solid waste (MSW) and refuse derived fuel (RDF) and are based on Rankine cycle technology application, combustion or incineration, Bio-methanation, Pyrolysis and High end gasifier technologies.

65. Capital Cost

65.1 The Commission shall determine only project specific capital cost and tariff based on prevailing market trends for MSW/RDF projects.

66. Capacity Utilization Factor

66.1 Threshold Plant Load Factor for determining fixed charge component of Tariff shall be:

a) During Stabilisation: 65%

b) During the remaining period of the first year (after stabilization): 65%

c) From 2 Year onwards: 75% for MSW based technologies and 80% for RDF based technologies.

66.2 The stabilisation period shall not be more than 6 months from the date of commissioning of the project.

67. Auxiliary Consumption

67.1 The auxiliary power consumption for the power projects which use municipal solid waste and refuse derived fuel shall be 15%.

68. Station Heat Rate

68.1 The Station Heat Rate for power projects which use municipal solid waste and refuse derived fuel shall be 4200 kcal/kWh.

69. Operation and Maintenance Expenses

69.1 The Commission shall determine only project specific O&M expenses based on prevailing market trends for MSW/RDF projects.

70. Calorific Value

70.1 The Calorific Value of the municipal solid waste and refuse derived fuel used for the purpose of determination of tariff shall be at 2500 kcal/Kg.

71. Fuel Cost

71.1 Refuse derived fuel (RDF) price during FY 2022-23 shall be Rs. 2297.888 per MT. For each subsequent year of the Tariff Period, the normative escalation factor of 5% per annum shall be applicable at the option of the refuse derived fuel (RDF) project developer. No fuel cost shall be considered for determination of tariff for the power projects using municipal solid waste (MSW).

72. Monitoring Mechanism for the use of MSW/RDF

72.1 The project developer shall furnish a monthly fuel procurement statement and monthly fuel usage statement duly certified by Chartered Accountant to the beneficiary licensee, with complete details as may be required to the satisfaction of the beneficiary licensee, with whom the power purchase agreement has been made (with a copy to appropriate agency i.e. CREDA for the purpose of monitoring MSW/RDF consumption) for each month. The statement shall cover details such as

i. Opening fuel stock quantity (in tonnes), for each type of fuel,

ii. **Receipt of fuel quantity (in tonnes) at the power plant site for each type of fuel during the month,**

iii. Quantity of fuel (in tonnes) for each fuel type consumed during the month for

power generation purposes,

iv. Closing fuel stock quantity (in tonnes) for each fuel type available at the power plant site at the end of the month,

v. Cumulative quantity (in tonnes) of each fuel type procured till the end of that month during the financial year,

vi. Cumulative quantity (in tonnes) for each fuel type consumed till end of that month during the financial year,

vii. Actual (gross and net) energy generation (denominated in lakh of units) during the month,

viii. Cumulative actual (gross and net) energy generation (denominated in lakh of units) until the end of that month during the financial year,

72.2 Non compliance of the above provisions to be brought to the notice of the Commission. Appropriate mechanism shall be incorporated in the power purchase agreement between the parties with due approval of the Commission for the compliance of uses of MSW/RDF fuel.

72.3 Non-compliance with the condition of MSW/RDF usage by the project developer, during any financial year, shall render such waste to energy project to be ineligible to avail preferential tariff determined as per these Regulations in the year of default during such financial year when such default occurs. However, such defaulting waste to energy project shall continue to sell power to concern distribution licensee even during the period of default. The rate of supply to distribution licensee will be weighted average pooled price at which the distribution licensee has purchased the electricity including cost of self generation, if any, (in the defaulting year of waste to energy project plant) from all the long-term and short-term energy suppliers, but excluding those based on renewable energy sources, as the case may be, for the entire year of default and additional payment arrived to such power project will be adjusted in future bills in six equal monthly instalments.

73. Power to require statistics & returns by Monitoring agency

73.1 The Chhattisgarh Renewable Energy Development Agency (CREDA) shall be responsible for monitoring compliance of fuel these projects.

73.2 CREDA shall also maintain such data, including technical and commercial details (including year of COD, uses of fuel), source of fuel etc.) of waste to energy projects in the State and shall make the data available in the public domain by publishing the same on its website with quarterly updation.

73.3 The project developer shall submit the information to CREDA as required under Regulation 72 in the format as designed by CREDA.

73.4 CREDA shall submit an annual report on an affidavit duly notarised, for the entire financial year to the Commission for each waste to energy plant on the use of MSW/RDF fuel during the preceding year, by the end of April every year. CREDA shall also submit the same annual report for the entire financial year to the beneficiary distribution licensee.

Chapter 10: Technology specific parameters for Biogas based Power Projects

74. Capital Cost

74.1 Normative capital cost for biogas-based power projects shall be Rs. 1186 lakh per MW for first year of the Control Period i.e. financial year 2022-23.
After taking into account of capital subsidy net project cost shall be Rs. 886 Lakh per MW.

75. Plant Load Factor

75.1 Plant load factor shall be considered as 90% for determination of tariff.

76. Auxiliary Consumption

76.1 The auxiliary consumption shall be considered as 12% for determination of tariff.

77. Operation and Maintenance Expenses

77.1 Normative O&M expenses for the first year of the Control Period i.e. financial year 2022-23 shall be Rs. 66.1 lakhs per MW.

77.2 Normative O&M expenses allowed at the commencement of the tariff Period shall be escalated at the rate of 3.84% per annum for the subsequent years of the control period.

78. Specific Fuel Consumption

78.1 Normative specific fuel consumption shall be 3 kg of substrate mix per kWh.

79. Fuel Cost (Feed stock Price)

79.1 Feed stock price during first year of the Control Period i.e., financial year 2022-23 shall be Rs. 2000 per MT and shall be escalated at the rate of 5% per annum to arrive at the base price for subsequent years of the Control Period, unless specifically reviewed by Commission. For the purpose of determining levelized tariff, a normative escalation factor of 5% per annum shall be applicable.

Chapter 11: Miscellaneous

80. Deviation from norms

80.1 Tariff for sale of electricity by the generating company may also be determined in deviation from the norms specified in these Regulations subject to the conditions that the reasons for deviation from the norms specified under these Regulations shall be recorded in writing.

81. Power to Relax

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

82. Power to remove difficulties

82.1 If any difficulty arises in giving effect to these Regulations, the Commission may, of its own motion or otherwise, by an order and after giving a reasonable opportunity to those likely to be affected by such order, make such provisions, not inconsistent with these regulations, as may appear to be necessary for removing the difficulty.

83. Repeal & Savings

83.1 On commencement of these Regulations, the Chhattisgarh Electricity Regulatory Commission (Terms and conditions for determination of generation tariff and related matters for waste to energy projects) Regulations 2019, shall stand repealed.

83.2 Notwithstanding anything contained in Regulation 83.1, generic preferential tariff order issued by the Commission in accordance with provisions in the Chhattisgarh Electricity Regulatory Commission (Terms and conditions for determination of generation tariff and related matters for waste to energy projects) Regulations, 2016 shall continue to be valid till the expiry of the tariff period.

By Order of the Commission

(S.P. Shukla)
Secretary

Form-1.1. Template for (Wind Power / Small Hydro Project / Solar PV / Solar thermal): Parameter Assumptions

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter Values
1	**Power Generation**				
		Capacity			
			Installed Power Generation Capacity	MW	
			Capacity Utilization Factor	%	
			Commercial Operation Date	mm/yyyy	
			Useful Life	Years	
2	**Project Cost**				
		Capital Cost / MW			
			Normative Capital Cost	Rs. lakh /MW	
			Capital Cost	Rs. Lakh	
			Capital Subsidy, if any	Rs. Lakh	
			Net Capital cost	Rs. Lakh	
3	**Financial Assumptions**				
			Tariff period	years	
		Debt:Equity			
			Debt	%	
			Equity	%	
			Total Debt Amount	Rs. Lakh	
			Total Equity Amount	Rs. Lakh	
		Debt component			
			Loan amount	Rs. Lakh	
			Moratorium Period	years	
			Repayment period (incld Moratorium)	Years	
			Interest Rate	%	
		Equity component			
			Equity amount	Rs. Lakh	
			Return on Equity for first 10 years	% p.a.	
			Return on Equity 11th year onwards	% p.a.	
		Depreciation			
			Depreciation rate for first 12 years	%	
			Depreciation rate 13th year onwards	%	
4	**Operation & Maintenance**				
		Normative O&M expense		Rs. Lakh / MW	
		O&M expenses per annum		Rs. Lakh	
		Escalation factor for O&M expenses		%	
5	**Working Capital**				
		O&M expense		Months	
		Maintenance Spare	(% of O&M expenses)	%	
		Receivables		Months	
		Interest on working capital		% p.a.	

Form 1.2: Template for (Wind Power / Small Hydro Project / Solar PV / Solar thermal): Determination of Tariff Components

Units Generation	**Unit**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
Installed capacity	MW					
Net Generation	MU					
Tariff Components (Fixed charge)	**Unit**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
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 Tariff Components	**Unit**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
PU O&M Expenses	Rs./kWh					
PU Depreciation	Rs./kWh					
PU Interest on term loan	Rs./kWh					
PU Interest on working capital	Rs./kWh					
PU Return on Equity	Rs./kWh					
PU Tariff Components	**Rs./kWh**					

Form 2.1: Template for (Biomass power , Biogas Based Power Project, Municipal Solid Waste, Refuse Derived Fuel or Non-fossil fuel based Cogen): Parameter Assumptions

Form 2.1: Template for (Biomass power , Municipal Solid Waste, Refuse Derived Fuel or Non-fossil fuel based Cogen): Parameter Assumptions					
S. No.	**Assumption Head**	**Sub-Head**	**Sub-Head (2)**	**Unit**	**Parameter Values**
1	**Power Generation**				
		Capacity			
			Installed Power Generation Capacity	MW	
			Auxiliary Consumption factor	%	
			PLF during first six months of COD	%	
			PLF in next six months upto one year of COD	%	
			PLF from 2nd Year of COD onwards	%	
			Commercial Operation Date	mm/yyyy	
			Useful Life	Years	
2	**Project Cost**				
		Capital Cost / MW			
			Normative Capital Cost	Rs. Lakh /MW	
			Capital Cost	Rs. Lakh	
			Capital Subsidy, if any	Rs. Lakh	
			Net Capital cost	Rs. Lakh	
3	**Financial Assumptions**				
			Tariff period	years	
		Debt Equity			
			Debt	%	
			Equity	%	
			Total Debt Amount	Rs. Lakh	
			Total Equity Amount	Rs. Lakh	
		Debt component			
			Loan amount	Rs. Lakh	
			Moratorium Period	years	
			Repayment period (incld Moratorium)	Years	
			Interest Rate	%	
		Equity component			
			Equity amount	Rs. Lakh	
			Return on Equity for first 10 years	% p.a.	
			Return on Equity 11th year onwards	% p.a.	
		Depreciation			
			Depreciation rate for first 12 years	%	
			Depreciation rate 13th year onwards	%	
4	**Operation & Maintenance**				
		Normative O&M expense		Rs. Lakh / MW	
		O&M expenses per annum		Rs. Lakh	
		Escalation factor for O&M expenses		%	
5	**Working Capital**				
		O&M expense		Months	
		Maintenance Spare	(% of O&M expenses)	%	
		Receivables		Months	
		Biomass stock		Months	
		Municipal Solid Waste Stock		Months	
		Refused Derived Fuel Stock		Months	
		Interest on working capital		% p.a.	
6	**Fuel related assumptions**				
		Station Heat Rate	During stabilisation	kcal/kWh	
			Post stabilisation	kcal/kWh	
		Fuel types & mix	Biomass fuel type-1	%	
			Biomass fuel type-2	%	
			Municipal Solid Waste Fuel	%	
			Refuse Derived Fuel	%	
			Fossil Fuel (coal)	%	
			GCV of Biomass fuel type-1	kCal/kg	
			GCV of Biomass fuel type-2	kCal/kg	
			GCV of Municipal Solid Waste Fuel	kCal/kg	
			GCV of Refuse Derived Fuel	kCal/kg	
			GCV of fossil fuel (coal)	kCal/kg	
			Biomass Price (fuel type-1): Yr-1	Rs./MT	
			Biomass Price (fuel type-2):Yr-1	Rs./MT	
			Municipal Solid Waste Price / year-1	Rs./MT	
			Refuse Derived Fuel Price/ year-1	Rs./MT	
			Fossil Fuel price (coal): Yr-1	Rs./MT	
			Fuel price escalation factor	% p.a.	

Form2.2: Template for (Biomass power , Biogas Based Power Project, Municipal Solid Waste, Refuse Derived Fuel or Non-fossil fuel based Cogen): Determination of Tariff Components

Form2.2: Template for (Biomass power , Municipal Solid Waste, Refuse Derived Fuel or Non-fossil fuel based Cogen): Determination of Tariff Components						
Units Generation	**Unit**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
Installed capacity	MW					
Net Generation	MU					
Tariff Components (Fixed charge)	**Unit**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
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**					
Tariff Components (Variable charge)	**Unit**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
Biomass fuel type-1	Rs. Lakh					
Biomass fuel type-2	Rs. Lakh					
Fossil fuel (coal)	Rs. Lakh					
Municipal Solid Waste	Rs. Lakh					
Refuse Derived Fuel	Rs. Lakh					
Sub total (Fuel costs)	**Rs. Lakh**					
Fuel cost allocable to power	%					
Total Fuel costs	**Rs. Lakh**					
Per Unit Tariff Components (Fixed)	**Unit**	**Year-1**	**Year-2**	**Year-3**	**Year-4**	**Year-5**
PU O&M Expenses	Rs./kWh					
PU Depreciation	Rs./kWh					
PU Interest on term loan	Rs./kWh					
PU Interest on working capital	Rs./kWh					
PU Return on Equity	Rs./kWh					
PU Tariff Components (Fixed)	**Rs./kWh**					
PU Tariff Components (Variable)	**Rs./kWh**					
PU Tariff Components (Total)	**Rs./kWh**					

Form 3.1: Template for Biomass power / Biogas based power project / non-fossil fuel based Cogen: Fuel usage Statement

Sources of Power :
1……. 2……. 3……. 4……

Sl. No.	Month	Biomass Fuel-1 Consumptions (in tonnes)			Biomass Fuel-2 Consumptions (in tonnes)			Biomass Fuel-1 Consumptions (in tonnes)			Fossil Fuel (Coal) consumption (in tonnes)			% Fossil Fuel consumption of Total Fuel Consumption (%)		Energy Generation (kWH) during month		Cummulative Energy Generation (kWh) during FY till end of month	
		Type of Fuel	During current month	Calorific Value, Kcal/kg	Type of Fuel	During current month	Calorific Value, Kcal/kg	Type of Fuel	During current month	Calorific Value, Kcal/kg	Grade of coal used	During current month	Calorific Value, Kcal/kg	During current month	Cummulative last 12 months	Gross	Net	Gross	Net
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	April																		
2	May																		
3	June																		
4	July																		
5	August																		
6	September																		
7	October																		
8	November																		
9	December																		
10	January																		
11	February																		
12	March																		

Form 3.2 : Monthly Fuel Usage Statement (2/2)

Monthly Update

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

Sl. No.	Month	Biomass Fuel-1 Consumptions (in tonnes)			Biomass Fuel-2 Consumptions (in tonnes)			Biomass Fuel-3Consumptions (in tonnes)			Biomass Fuel-4 Consumptions (in tonnes)		
		Opening stock	Received at power plant site	Closing stock	Opening stock	Received at power plant site	Closing stock	Opening stock	Received at power plant site	Closing stock	Opening stock	Received at power plant site	Closing stock
1	2	3	4	5	7	8	9	11	12	13	15	16	17
1	January												
2	February												
3	March												
4	April												
5	May												
6	June												
7	July												
8	August												
9	September												
10	October												
11	November												
12	December												