

**MAHARASHTRA ELECTRICITY REGULATORY COMMISSION  
(TERMS AND CONDITIONS FOR DETERMINATION OF RENEWABLE  
ENERGY TARIFF) REGULATIONS, 2019.**

ELECTRICITY ACT, 2003.

No. MERC/Tech/Regulation/1235- 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, 2019.
- 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:

Provided that it shall not include energy consumed for supply of power by the generating Station to its housing colony and other facilities, and for construction works at 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 and liquid fuel 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<sub>2</sub>) and traces of Methane (CH<sub>4</sub>), 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 applicable 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) 'concerned Distribution Licensee' means the Distribution Licensee in the State of Maharashtra with whom the RE generator has signed Energy Purchase Agreement;
- (l) 'Conduct of Business Regulations' means the Maharashtra Electricity Regulatory Commission (Conduct of Business) Regulations, 2004 as amended from time to time;
- (m) 'Date of Commissioning' means the date of commissioning declared by a Generating Company in relation to a Unit of its Generating Station:

Provided that date of commissioning shall be certified based on joint inspection by RE Generator and concerned Distribution Licensee or SLDC as may be applicable;

- (n) 'Eligible Project' means any of the following Renewable Energy Projects with or without Storage:
  - 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 42 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 specified under Regulation 59 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;

'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 fulfil 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, and any other combination of RE technologies, 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;
- (o) 'Existing RE Project' means a Renewable Energy Project commissioned prior to the notification of these Regulations;
- (p) 'Gross Calorific Value' or 'GCV', in relation to a fuel used in a Generating Station, means the heat produced in kilocalories 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;
- (q) 'Gross Station Heat Rate' or 'GSHR' means the heat energy input in kilocalories required to generate one kWh of electrical energy at generator terminals of a Renewable Energy Project that uses fuel for generation;
- (r) 'Hybrid Renewable Energy Project' means a Renewable Energy Project that uses a combination of Renewable Energy technologies approved by MNRE for electricity generation, configured to operate at the same point of grid connection:
- Provided that the rated capacity of one resource is at least 25% of the rated capacity of other resource;
- (s) '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;
- (t) 'Inter-connection Point' shall be the point where the power from the Project is injected into the nearest transmission/distribution grid sub-station, including the dedicated transmission/distribution line connecting the Projects with such sub-station;
- (u) 'Micro Hydro Power Project' means a Hydro Power Project with a Station capacity up to and including 500 kW;
- (v) 'Mini Hydro Power Project' means a Hydro Power Project with a Station capacity

- of 1 MW or less, but above 500 kW;
- (w) 'MNRE' means the Ministry of New and Renewable Energy of the Government of India;
  - (x) 'New RE Project' means a Renewable Energy Project commissioned on or after date of applicability of these Regulations;
  - (y) '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;
  - (z) '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;
  - (aa) '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;
  - (bb) 'Renewable Energy' or 'RE' means the grid quality electricity generated from Renewable Energy sources;
  - (cc) 'Renewable Energy Power Project' means a power project, other than a conventional power Project, generating grid quality electricity from Renewable Energy sources;
  - (dd) '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;
  - (ee) 'Re-powering' means the process of replacing older wind turbines with newer ones that have either a higher name-plate capacity or higher CUF, which results in a net increase in power generated from the same site;
  - (ff) 'Review Period' means the period during which the norms for determination of tariff specified in these Regulations shall remain valid;
  - (gg) 'Small Hydro Power Project' means a Hydro Power Project with a Station capacity of 25 MW or less, but above 1 MW;
  - (hh) 'Solar PV Power Project' means a power project that uses sunlight for direct conversion into electricity through Photo Voltaic technology;
  - (ii) '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, from time to time;

- (jj) ‘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;
- (kk) ‘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;
- (ll) ‘Storage’ means energy storage system utilising methods and technologies like Batteries, Pumped Storage hydro-power, Compressed Air, thermal storage, or any other technology, to store various forms of energy and deliver the stored energy in the form of electricity;
- (mm) ‘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;
- (nn) ‘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 | 25 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 Hybrid RE Projects shall be minimum of Useful Life of different RE technologies combined for the Hybrid RE Project:

Provided further 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 specified by the Central Commission;

- (oo) ‘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 fulfil the following criteria:

- (a) are commissioned in the State of Maharashtra for the generation and sale of electricity to Distribution Licensees in the State;
- (b) are Eligible Projects for the purposes of these Regulations; and
- (c) 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, 2019, as amended from time to time, 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 applicable Regulations or RE Tariff Orders issued by the Commission from time to time.

### **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 source-wise RE purchase in MU; 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:

Provided that 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 State Nodal Agency shall furnish the following quarterly information to the Commission, within two months of the close of the preceding quarter:

- a) details of source-wise RE capacity addition in MW;
- b) details of source-wise RE purchase by each Distribution Licensee in MU; and
- c) a statement of Energy Purchase Agreements (EPAs) entered into under these Regulations by each Distribution Licensee;
- d) Projects registered in the State for each Technology in that quarter as well as cumulatively;
- e) Source-wise RE capacity addition vis-à-vis Technical Potential,

in addition to any other information that the Commission may stipulate from time to time:

Provided that the State Nodal Agency shall also upload and update the above information on its website on a quarterly basis, along with details of capacity addition in previous years.

4.3 The 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., as well as any other information that may be desired by the Commission.

4.4 All RE Generating Companies shall submit data on actual O&M expenses incurred on annual basis, duly certified by the Statutory Auditor, to the State Nodal Agency:

Provided that the State Nodal Agency shall compile such data on a yearly basis for different RE technologies and submit the same to the Commission by October 31st of every year, for the actual O&M expenses incurred by RE Generating Companies in the State of Maharashtra during the previous year.

## **Chapter 1: General Principles**

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### **5. Review Period**

5.1 These Regulations shall be applicable with effect from April 1, 2020.

5.2 The first Review Period under these Regulations shall be five (5) financial years (FY), from FY 2020-21 up to the end of FY 2024-25.

5.3 At the end of the first Review Period, the Commission may, either extend the applicability of these Regulations for a further period with any modifications through Order, or decide



to notify new Regulations for subsequent period:

Provided that, the principles and tariff norms specified in these Regulations shall continue to apply until either the applicability of these Regulations are extended by the Commission through Order or new Regulations are notified, subject to any adjustments that may be specified therein.

## **6. Tariff Period**

6.1 The Tariff Period for RE Projects shall be equal to their Useful Life, as under:

- |   |                                 |
|---|---------------------------------|
| a) Wind Energy Power Projects                                       | 25 years                        |
| b) Biomass-based Power Project, Non-Fossil Fuel-based Co-Generation | 25 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 Power Projects                                 | 25 years                        |
| f) Hybrid RE Projects and other RE Projects                         | Equal to Useful Life of Project |

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

## **7. Competitive Bidding for procurement of power generated by grid-connected RE Projects**

7.1 The tariff shall invariably be determined through a transparent process of competitive bidding in accordance with the Guidelines issued by the Central Government under Section 63 of the Act, inter-alia for the following types of RE Projects:

- (a) Wind Energy Power Projects;
- (b) Solar PV Power Projects;
- (c) Non-Fossil Fuel-based Co-Generation;
- (d) Biomass based Projects;
- (e) Hybrid RE Power Projects.

7.2 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 the Guidelines issued by the Central Government under Section 63 of the Act.

7.3 The tariff for RE Power Projects below threshold limit of eligibility for participating in Competitive Bidding shall be considered equal to the following cases, in order of priority:

- (a) Latest Tariff discovered through Competitive Bidding by concerned Distribution Licensee for similar RE project and adopted by the appropriate Commission;
- (b) The Tariff discovered through Competitive Bidding for similar RE project by Other Distribution Licensee(s) in the State and adopted by the appropriate Commission;
- (c) The Tariff discovered through Competitive Bidding for similar RE project in the Country and adopted by the appropriate Commission.

## **8. Generic Tariff**

The Commission shall notify the generic tariff for Solar Roof-top PV Power Projects and determine the Variable Charges for Biomass and Non-fossil fuel-based Co-generation Projects, in accordance with the norms specified in these Regulations:

Provided that the above Generic Tariff determination of Variable Charges shall not apply for Biomass and Non-fossil fuel-based Co-generation Projects, whose tariff has been determined through the competitive bidding process and adopted by the Commission.

## **9. Project-specific Tariff**

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

- (a) Waste to Energy Projects based on the technologies approved by MNRE;
- (b) Solar Thermal Power Projects;
- (c) Small Hydro Projects, Mini Hydro Projects and Micro Hydro Projects;
- (d) Re-powering of Wind Energy Power Projects;
- (e) Projects based on any other RE technologies approved by MNRE after notification of these Regulations;
- (f) Any other RE technology, for which either Generic Tariff is being determined or for which the tariff is to be invariably determined through competitive bidding, in respect of which the Project Entities opt for a project-specific tariff.

9.2 The determination of project-specific tariff for generation of electricity from such RE sources shall be in accordance with the ceiling norms specified in these Regulations for the respective technologies and the terms and conditions as may be stipulated in the relevant Orders of the Commission:

Provided that the financial norms specified in Chapter 2, shall be the ceiling norms while determining such project-specific tariff.

## **10. Petition and proceedings for determination of tariff**

10.1 The Commission shall notify the generic tariff for the respective RE technology/ies, as far as practicable before or at the beginning of each year of the Review Period, in accordance with the norms specified in these Regulations.

10.2 A Petition for determination of project-specific tariff shall be filed by the concerned RE Power Project entity, with the concerned Distribution Licensee as a Respondent, 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) An EPA with a Distribution Licensee in the State of Maharashtra, clearly stipulating that the tariff to be determined by the Commission in accordance with these Regulations and the consequences of under-generation or excess generation vis-à-vis the guaranteed generation;
- (c) A detailed project report outlining technical and operational details, site-specific aspects, premise for Capital Cost and financing plan, etc.;
- (d) A statement of all applicable terms and conditions and expected expenditure for the period for which tariff is to be determined;
- (e) 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;
- (f) Details of financial gain through REC or any other mechanism;
- (g) Any other information that the Commission may require the Petitioner to submit.

10.3 In case the RE Project fails to generate energy up to the guaranteed CUF, then the RE Project proponent shall compensate the concerned Distribution Licensee to the extent of under-generation at 75 percent of the tariff approved by the Commission:

Provided that the above compensation shall not be applicable for RE technologies having single-part tariff with two components, viz., fixed cost component and fuel cost component:

Provided further that in case the above under-generation is on account of transmission/distribution constraints, then such under-generation shall be considered as deemed generation by the RE Project and be compensated accordingly.

10.4 In case the RE Project generates energy in excess of the guaranteed CUF, then the RE Project proponent shall be entitled to receive compensation from the concerned

Distribution Licensee for such excess generation at 75 percent of the tariff approved by the Commission.

10.5 In case of RE technologies covered under Regulation 9.1 (f), in addition to the above requirements, the Petition for determination of project-specific tariff shall also be accompanied by:

- (a) Rationale for adoption of project specific tariff instead of Competitive Bidding;
- (b) Status of compliance with the Renewable Purchase Obligation (RPO) with and without the proposed Project(s);
- (c) Competitiveness of proposed tariff vis-à-vis tariff discovered through Competitive bidding/tariff prevalent in the market.

10.6 The proceedings for determination of tariff shall be in accordance with the Maharashtra Electricity Regulatory Commission (Conduct of Business) Regulations, 2004, as amended from time to time.

## **11. 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.

## **12. Tariff Design**

12.1 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 for the Tariff Period, considering the year of commissioning of the Project for the fixed cost component, while the fuel cost component shall be determined separately for each year of operation.

12.2 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.

### **13. Scheduling and Despatch principles for electricity generated from RE Sources**

- 13.1 The Biomass-based Power Projects and Co-Generation Projects shall be subject to the respective scheduling and despatch code as specified under the State Grid Code, as amended from time to time.
- 13.2 The Wind Energy Power Projects and Solar PV Power Projects shall be subject to the MERC (Forecasting, Scheduling and Despatch of Solar and Wind Generation) Regulations, 2018, as amended from time to time.
- 13.3 Subject to the provisions of the Indian Electricity Grid Code and the State Electricity Grid Code, all RE Power Projects shall be treated as 'Must Run' Projects and shall not be subjected to 'merit order despatch' principles.

## **Chapter 2: Financial Principles**

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### **14. 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.

### **15. Debt-equity Ratio**

- 15.1 For determination of generic tariff by the Commission, the debt-equity ratio shall be considered to be 70:30.
- 15.2 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.

### **16. Loan and Finance Charges**

#### **16.1 Loan Tenure:**

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

## 16.2 Interest Rate:

- (a) The quantum of loan arrived at as specified above shall be considered as the gross normative loan for computation of the interest on loan;
- (b) The normative loan outstanding as on 1<sup>st</sup> April of every year shall be worked out by deducting the cumulative repayment up to 31<sup>st</sup> March of the previous year from the gross normative loan;
- (c) For the purpose of computation of tariff, the average of the one-year Marginal Cost of Funds-based Lending Rate ('MCLR') as declared by the State Bank of India for the previous year plus 200 basis points, shall be considered as the normative interest rate;
- (d) 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.

16.3 The treatment of foreign currency loans shall be in accordance with the Maharashtra Electricity Regulatory Commission (Multi-Year Tariff) Regulations in force from time to time.

## 17. Depreciation

- 17.1 The value base for the purpose of depreciation shall be the capital cost of the asset as admitted by the Commission.
- 17.2 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, excluding the cost of freehold land, if any.
- 17.3 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 13<sup>th</sup> year onwards.
- 17.4 Depreciation shall be chargeable from the first year of commercial operation.

## 18. Return on Equity

- 18.1 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 15.
- 18.2 The Return on Equity shall be computed at the base rate of 14%, to be grossed up as per the Minimum Alternate Tax ('MAT') rate applicable as on 1st April of the previous Financial Year.

## **19. Interest on Working Capital**

19.1 The Working Capital requirement in respect of Wind Energy Projects and Small Hydro, Solar PV, Solar Thermal, and Solar Rooftop PV Power Projects, shall consist 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.

19.2 The Working Capital requirement in respect of Biomass-based Projects, non-fossil fuel-based Co-Generation Projects, and Waste to Energy Projects shall consist 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.

19.3 Interest on Working Capital shall be the average of the one-year Marginal Cost of Funds-based Lending Rate ('MCLR') as declared by the State Bank of India for the previous year plus 150 basis points.

## **20. Operation and Maintenance Expenses**

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

20.2 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.

20.3 Normative O&M expenses allowed under these Regulations shall be escalated at the rate specified for Generating Companies in the MERC (Multi Year Tariff) Regulations, 2019, as amended from time to time, for computation of the levelized tariff.

## **21. Rebate**

21.1 For payment of bills of the Project Entity through revolving and valid Letter of Credit, a rebate of 2% shall be allowed.

21.2 Where payments are made other than through Letter of Credit within seven days of

presentation of bills by the Project Entity, a rebate of 1% shall be allowed.

## **22. Late Payment Surcharge**

In case the payment of any bill for charges payable under these Regulations is delayed beyond a period of 30 days from the date of billing, Late Payment Surcharge on simple interest basis at the one-year MCLR as declared by the State Bank of India as on 1<sup>st</sup> of the respective month plus 350 basis points per annum on the billed amount, shall be levied for the period of delay by the Project Entity.

## **23. 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, and the entire proceeds of carbon credit from approved CDM Project, if any, shall be retained by it.

## **24. 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.

## **25. Grant, Subsidy or Incentive from the Central/State Government**

25.1 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:

25.2 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.

25.3 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 instalments or within such period as may be stipulated by the Commission.

25.4 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 neither be taken into account while determining the tariff nor be deducted by the Distribution Licensee in subsequent bills raised by the particular Project Entity.

25.5 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 levelized basis at a discounting factor equivalent to the post-tax weighted average cost of capital.

## **26. 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**

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### **27. Capital Cost**

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:

Provided that the Commission shall approve the Capital Cost in case of project-specific tariff considering the prevalent market conditions.

### **28. Capacity Utilisation Factor**

The minimum normative CUF for Wind Energy Projects for the Review Period shall be 30% for the purpose of tariff determination:

Provided that the Wind Energy Projects will be allowed to revise the same once within first year after COD; thereafter, the CUF for the Project shall remain unchanged for the entire term of the PPA:

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

### **29. Operation and Maintenance Expenses**

The ceiling normative O&M expenses for the base year of the Review Period shall be Rs. 7.72 lakh per MW, for the purpose of tariff determination.

### **30. Tariff Determination in case of Re-powering of Wind Energy Power Project**

30.1 A Project-specific tariff shall be determined by the Commission in case of Re-powering

of Wind Energy Power Project, subject to the following conditions, in addition to the conditions specified in Regulation 10.2 for determination of Project-specific tariff:

- (a) The older wind turbines shall have been operational for at least 15 years of Useful Life since their commissioning:

Provided that based on cost economics, contracting Parties may agree for Re-powering of wind turbine, which has been operational for lower than 15 years;

- (b) The Wind Energy Turbine/Project undergoing Re-powering would be exempted from honouring the terms of the Energy Purchase Agreement for the non-availability of generation from Wind Turbine/Project during the period of execution of Re-powering;
- (c) The older wind turbines shall be replaced by newer wind turbines having either a higher name-plate capacity or higher CUF, and should result in a net increase in power generated from the same site;
- (d) Detailed Project Report shall also clearly explain the rationale and benefits of Re-powering vis-à-vis setting up of a new project;
- (e) Competitiveness of proposed tariff vis-à-vis tariff discovered through Competitive bidding/tariff prevalent in the market for similar RE project and adopted by the appropriate Commission.

## **Chapter 4: Technology-specific Parameters for Small/Mini/Micro Hydro Power Projects**

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### **31. Capital Cost**

The Capital Cost for Small/Mini/Micro Hydro Power Projects shall include the Turbine Generator including its auxiliaries, land cost, site development charges and other civil works, resettlement and rehabilitation costs, if any, transportation charges, evacuation cost up to inter-connection point, financing charges and Interest during Construction:

Provided that the Commission shall approve the Capital Cost in case of project-specific tariff considering the prevalent market conditions.

### **32. Capacity Utilisation Factor**

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

### **33. Auxiliary Consumption**

The ceiling normative Auxiliary Consumption for Small/Mini/Micro Hydro Power Projects

shall be 1.0% for the purpose of tariff determination.

### **34. Operation and Maintenance Expenses**

The ceiling normative O&M expenses for the base year of the Review Period for the purpose of tariff determination shall be as follows:

<b>Project Size</b>	<b>O&amp;M Expenses (Rs lakh/MW)</b>
Up to 500 kW	4.00% of the Capital Cost
Greater than 500 kW and up to and including 1 MW	4.00% of the Capital Cost
Greater than 1 MW and up to and including 5 MW	3.60% of the Capital Cost
Greater than 5 MW and up to and including 25 MW	2.80% of the Capital Cost

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

### **35. Applicability**

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

35.2 The fuel-related aspects specified in Regulations 41 to 47 shall be applicable to both existing and new Biomass-based Power Projects:

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

### **36. Capital Cost**

The Capital Cost for Biomass-based Power Projects shall include the 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:

Provided that the Commission shall approve the Capital Cost in case of project-specific tariff considering the prevalent market conditions.

### **37. Plant Load Factor**

37.1 The minimum 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%.

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

### **38. Auxiliary Consumption**

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

### **39. Station Heat Rate**

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

### **40. Operation and Maintenance Expenses**

The ceiling 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.

### **41. Fuel Mix**

41.1 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, Refuse Derived Fuel (RDF), etc., or other biomass fuels as may be approved by MNRE.

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

### **42. Use of Fossil Fuel**

42.1 The use of fossil fuels for Existing RE Projects shall be limited to the extent of 15% of the total fuel consumption on an annual basis.

42.2 Use of fossil fuels for generation shall not be allowed for New RE Projects, and the entire power has to be generated using biomass.

### **43. Monitoring of use of Fossil Fuel**

43.1 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 the 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 for each fuel type (in tonnes);
- f. Receipt of fuel quantity for each fuel type (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.

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

Provided that such defaulting Biomass-based Project shall continue to sell power to the Distribution Licensee during the period of default at a rate lower by Rs. 0.50/kWh below the applicable preferential tariff determined for the relevant year or the APPC or latest tariff discovered through Competitive Bidding, whichever is lower:

Provided further that if the period of such default exceeds 90 days at any point in the Useful Life of the Project, then the concerned Distribution Licensee shall have the option to terminate the EPA with effect from such date.

#### **44. Compliance Monitoring for Biomass-based Power Projects**

44.1 The Distribution Licensee shall be responsible for monitoring compliance with these Regulations by Biomass-based Power Projects from whom it is procuring power.

44.2 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.

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

44.4 The State Nodal Agency shall be responsible for ensuring compliance with these Regulations by Biomass-based Power Projects from whom the Distribution Licensees in the State are procuring power.

#### **45. Calorific Value**

45.1 The minimum average Calorific Value of the biomass fuel(s) used for the purpose of  
MERC RE Tariff Regulation, 2019

determination of tariff for Existing Biomass-based Power Projects shall be 3611 kcal/kg.

45.2 The minimum average Calorific Value of the biomass fuel(s) used for the purpose of determination of tariff for New Biomass-based Power Projects shall be 3100 kcal/kg.

#### **46. Fuel Price**

The biomass fuel price for the first year of the Project shall be determined based on the prevailing prices of the fuel mix for each Project and based on an independent study by the Commission, and shall thereafter be linked to the indexation mechanism specified in Regulation 47:

Provided that the aspects such as disposal cost, opportunity cost in terms of alternative uses of the fuel, and Gross Calorific Value shall be considered, while determining the fuel price.

#### **47. Fuel Price Indexation Mechanism**

47.1 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  $n^{\text{th}}$  year shall be computed as under:

$$VC_n = VC_1 \times (P_n / P_1)$$

where,

$VC_1$  represents the Variable Charge based on Biomass Price  $P_1$  for first year as specified under Regulation 46, and which shall be determined as under:

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Auxiliary Consumption Factor})} \times \frac{P_1}{1000}$$

$P_n$  = Price per tonne of biomass for the  $n^{\text{th}}$  year to be considered for tariff determination;

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

$P_1$  shall be the Biomass price for FY 2020-21 as specified under Regulation 46;

47.2 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 based on an independent study by the Commission, or 5% per annum, as the Commission may consider appropriate.

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

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### 48. 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).

### 49. Applicability

49.1 The ceiling performance norms specified in this Chapter shall be applicable only to new Non-Fossil Fuel-based Co-Generation projects commissioned after notification of these Regulations.

49.2 The fuel-related aspects specified under Regulations 55 to 58 and Regulations 60 to 62 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.

### 50. Capital Cost

The Capital Cost for Non-fossil fuel-based Co-Generation Projects shall include the 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:

Provided that the Commission shall approve the Capital Cost in case of project-specific tariff considering the prevalent market conditions.

### 51. Plant Load Factor

51.1 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%.

51.2 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%

## 52. Auxiliary Consumption

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

## 53. Station Heat Rate

The ceiling SHR for new non-fossil fuel-based Co-Generation Projects shall be 3600 kcal/kWh, for the purpose of tariff determination.

## 54. Operation and Maintenance Expenses

The ceiling 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.

## 55. Calorific Value

The minimum Gross Calorific Value for bagasse shall be considered as 2250 kcal/kg:

Provided that for the use of biomass fuels other than bagasse, the Calorific Value as specified in Regulation 45 shall be considered.

## 56. Fuel Price

The price of bagasse for the first year of the Project shall be determined based on the prevailing price of bagasse as assessed through an independent study by the Commission, and shall thereafter be linked to the indexation mechanism specified in Regulation 57:

Provided that the aspects such as disposal cost, opportunity cost in terms of alternative uses of the fuel, and Gross Calorific Value shall be considered, while determining the fuel price:

Provided further that for use of biomass other than bagasse, the biomass prices as specified under Regulation 46 shall be applicable.

## 57. Fuel Price Indexation Mechanism

57.1 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 n<sup>th</sup> year shall be computed as under:

$$VC_n = VC_1 \times (P_n / P_1)$$

where,

VC<sub>1</sub> represents the Variable Charge based on Bagasse Price P<sub>1</sub> for first year as specified under Regulation 56, and which shall be determined as under:



$$VC1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Auxiliary Consumption Factor})} \times \frac{P_1}{1000}$$

$P_n$  = Price per tonne of Bagasse for the  $n^{\text{th}}$  year to be considered for tariff determination

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

$P_1$  shall be the Bagasse price for FY 2020-21 as specified under Regulation 56.

57.2 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 based on an independent study by the Commission, or 5% per annum, as the Commission may consider appropriate.

## 58. Fuel Mix and Co-Generation Project Capacity

58.1 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.

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

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

## 59. Use of Fossil Fuel

59.1 The use of fossil fuels for Existing RE Projects shall be limited to the extent of 15% of the total fuel consumption on an annual basis.

59.2 Use of fossil fuels for generation shall not be allowed for New RE Projects, and the entire power has to be generated using non-fossil fuels.

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

The provisions of Regulations 42 and 43 relating to Biomass-based Projects shall apply *mutatis mutandis* to Non-Fossil Fuel-based Co-Generation Projects.

## 61. Measurement and Verification Protocol for Compliance Monitoring

61.1 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 purchasing

Distribution Licensee.

- 61.2 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.
- 61.3 The Distribution Licensee shall scrutinise such Audit Reports so as to verify compliance by the Project.
- 61.4 The Energy Audit shall be conducted during a period of steady load on the Plant during the season.
- 61.5 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 ( $T_1, P_1, T_2, P_2, \dots, T_n, P_n$ , etc.)
  - (e) The steam flow rates at 1,2, ...,n ( $m_1, m_2, \dots, m_n$ ) are to be measured with on line steam flow meters, which 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.
- 61.6 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.
- 61.7 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.
- 61.8 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 the State Nodal Agency.

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

61.10 The State Nodal Agency shall ensure compliance with the provisions of Energy Audit by all the Co-Generation Projects in the State, and submit an annual Report on the compliance status, within three months of the end of each Financial Year.

## **62. Compliance Monitoring of Non-fossil Fuel-based Co-Generation Projects**

62.1 The Distribution Licensee shall be responsible for monitoring compliance with these Regulations by Non-fossil Fuel-based Co-Generation Projects from whom it is procuring power.

62.2 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.

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

62.4 The State Nodal Agency shall be responsible for ensuring compliance with these Regulations by Non-fossil Fuel-based Co-Generation Projects from whom the Distribution Licensees in the State are procuring power.

## **63. Tariff for Non-fossil fuel-based Non-Qualifying Co-Generation Projects**

63.1 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 or latest tariff discovered through Competitive Bidding or previous approved Generic tariff, whichever is lower.

## **Chapter 7: Technology-specific parameters for Utility-Scale Solar PV Power Projects and Solar Rooftop PV Power Projects**

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### **64. Technology Aspects**

The norms specified under these Regulations shall be applicable for determination of project-specific tariff for Utility-Scale Solar PV Power Projects, using sunlight for direct conversion into electricity through Photo Voltaic technology as approved by MNRE:

Provided that for Solar Rooftop PV Power projects, the Generic Tariff shall be notified in accordance with the approach specified in Regulation 7.3.

### **65. Capital Cost**

The Capital Cost of Utility-Scale Solar PV Power Projects shall include the cost of the solar PV modules, inverter, land cost, site development charges and other civil works, transportation charges, evacuation cost up to inter-connection point, financing charges and Interest during Construction:

Provided that the Commission shall approve the Capital Cost in case of project-specific tariff considering the prevalent market conditions.

#### **66. Capacity Utilisation Factor**

The minimum normative CUF for Utility-Scale Solar PV Projects for the first year shall be 28% for the purpose of tariff determination during this Review Period:

Provided that the Utility-Scale Solar PV Projects will be allowed to revise the same once within first year after COD; thereafter, the CUF for the Project shall remain unchanged for the entire term of the PPA.

#### **67. Operation and Maintenance Expenses**

The ceiling O&M Expenses for Utility Scale Solar PV Power Projects for the first year of the Review Period shall be Rs. 6 lakh/MW.

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

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#### **68. Technology Aspects**

The ceiling 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.

#### **69. Capital Cost**

The Capital Cost for Solar Thermal Power Projects shall include the cost of the solar PV modules, inverter, land cost, site development charges and other civil works, transportation charges, evacuation cost up to inter-connection point, financing charges and Interest during Construction:

Provided that the Commission shall approve the Capital Cost in case of project-specific tariff considering the prevalent market conditions.

#### **70. Capacity Utilisation Factor**

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

#### **71. Operation and Maintenance Expenses**

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

## **72. Auxiliary Consumption**

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

## **Chapter 9: Miscellaneous**

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## **73. 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.

## **74. 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.

## **75. 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.

## **76. Power to Amend**

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

## **77. 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.

Mumbai

Dated: 30 December, 2019

**(Abhijit Deshpande)**

Secretary,

Maharashtra Electricity Regulatory Commission

**Form-1.1**

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

**Parameter Assumptions**

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity Capacity Utilization Factor Useful Life	MW % Years	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	
3	Sources of Fund	<u>Debt: Equity</u>  <u>Debt Component</u>  <u>Equity Component</u>	Tariff Period  Debt Equity Total Debt Amount Total Equity Amount  Loan Amount Repayment Period(incl Moratorium) Interest Rate  Equity amount Return on Equity RoE Period Weighted average of ROE Discount Rate	Years  % % Rs Lacs Rs Lacs  Rs Lacs years %  Rs Lacs % p.a Year  Year %	
4	Financial Assumptions	<u>Fiscal Assumptions</u>  <u>Depreciation</u>	MAT Rate  Depreciation Rate for first 12 years Depreciation Rate 13th year onwards Years for 5.83% rate	%  % %	
5	Working Capital	<u>For Fixed Charges</u> O&M Charges Maintenance Spare Receivables for Debtors Interest On Working Capital	(% of O&M exepenses)	Months  Months %	
6	Operation & Maintenance	Power Plant - Base Year Total O & M Expenses Escalation		Rs Lakh %	

**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																										
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>																										
Per unit Fixed Cost	Rs/kWh																										

Levallised tariff corresponding to Useful life

Per Unit Cost of 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
O&M expn	Rs/kWh																										
Depreciation	Rs/kWh																										
Int. on term loan	Rs/kWh																										
Int. on working capital	Rs/kWh																										
RoE	Rs/kWh																										
<b>Total COG</b>	<b>Rs/kWh</b>																										

COG excl. RoE

Discount Factor																											
Fixed Cost																											
<b>Levallised Tariff</b>		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 Auxillary Consumption during stabilisation Auxillary Consumption after stabilisation PLF(Stabilization for 6 months) PLF(during first year after Stabilization) PLF(second year onwards) Useful Life	MW % % % % % Years	
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	
3	Financial Assumptions	<u>Debt: Equity</u>  <u>Debt Component</u>  <u>Equity Component</u>	Debt Equity Total Debt Amount Total Equity Amount  Loan Amount Repayment Period(inclcd Moratorium) Interest Rate  Equity amount Return on Equity RoE Period Discount Rate (equiv. to WACC)	% % Rs Lacs Rs Lacs  Rs Lacs years %  Rs Lacs % p.a Year Year	
4	Financial Assumptions	<u>Fiscal Assumptions</u>  <u>Depreciation</u>	MAT Rate  Depreciation Rate(power plant) Depreciation Rate 13th year onwards Years for 5.83% depreciation rate	%  % %	
5	Working Capital	<u>For Fixed Charges</u> O&M Charges Maintenance Spare Receivables for Debtors <u>For Variable Charges</u> Biomass Stock Interest On Working Capital	(% of O&M exepenses)	Months Months Months %	
6	Fuel Related Assumptions	<u>Heat Rate</u>  <u>Biomass</u>	After Stabilisation period  Base Price (FY 20-21) GCV - Biomass	Kcal/kwh  Rs/T Kcal/kg	
7	Operation & Maintenance	Power Plant - Base Year <u>Total O &amp; M Expenses Escalation</u>		Rs Lakh %	



**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																					

Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh																					
Per unit Var Cost	Rs/kWh																					

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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																					
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>																					
Per unit Fixed Cost	Rs/kWh																					

Levelling tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Levelling	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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																					
<b>Total COG</b>	<b>Rs/kWh</b>																					

Levelling Tariff	Unit	Year -->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor																						
Variable Cost																						
Fixed Cost																						

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

**ANNEXURE B**

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

**Template 1.1: Monthly Fuel Usage Statement**

Name of the Project

(Location, District)

SNA / Utility Ref.No.

Installed Capacity (MW)

Date of Commissioning

For FY :

Statement Date:

Project Code:

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	
		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	Consumption 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 by Biomass and Co-Generation Project Entities to State Nodal Agency**

**Template 1.2: Monthly Fuel Usage Statement**

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

For FY :  
 Statement Date:  
 Project Code:

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	
		Gross	Net	Gross	Net	Type of fuel	During current month	Cumulativ e last 12 month	Type of fuel	During current month	Cumulativ e last 12 month	Type of fuel	During current month	Cumulativ e last 12 month	Grade of coal used	During current month	Cumulativ e last 12 month	During current month	Cumulative last 12 month
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																		

**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					Fossil Fuel (Coal) Procured				
		Cost to supplier	Storage cost	Handling cost	Transportation cost	Delivered cost of fuel	Cost to supplier	Storage cost	Handling cost	Transportation cost	Delivered cost of fuel	Cost to supplier	Storage cost	Handling cost	Transportation cost	Delivered cost of fuel	Cost to supplier	Storage cost	Handling cost	Transportation cost	Delivered cost of fuel
		Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	Rs./Ton	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																				