JOINT ELECTRICITY REGULATORY COMMISSION
FOR MANIPUR AND MIZORAM: AIZAWL

WHEREAS the Joint Electricity Regulatory Commission for Manipur and Mizoram have published in the Joint Electricity Regulatory Commission for Manipur and Mizoram Government Gazette on different dates the following, namely:-

- Joint Electricity Regulatory Commission for Manipur and Mizoram (JERC), (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2010;
  (Notification No. : H.13011/17/10- JERC, Dated: 31.05.2010)

  A. Joint Electricity Regulatory Commission for Manipur and Mizoram (JERC), (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2010; First Amendment
  (Notification No. : H.13011/17/10-JERC, Dated: 08.08.2014)

- Inserted/ Replaced matter is shown as *[ ]*^{D} at appropriate place; wordings inserted/ replaced shown within square brackets;
- In both of above cases; -^{D} ; superscript D implies that change is caused by Amendment '4';

N O T I F I C A T I O N

No. H.13011/17/10- JERC Dated Aizawl, the 31st May, 2010: In exercise of powers conferred under Section 61 read with Section 181 (2) of the Electricity Act, 2003 (36 of 2003), and all other powers enabling it in this behalf, and after previous publication, the Joint Electricity Regulatory Commission for Manipur and Mizoram hereby makes the following regulations, namely:

CHAPTER-1

1 Short title and commencement

(1) These Regulations may be called the Joint Electricity Regulatory Commission for Manipur & Mizoram (**Terms and Conditions for Tariff determination from Renewable Energy Sources)** Regulations, 2010.

(2) These Regulations extend to the whole of the States of Manipur & Mizoram and shall apply in relation to all matters falling within the jurisdiction of the Commission.

(3) These Regulations shall come into force from the date of their publication in the Official Gazette of Manipur and Mizoram.

2 Definitions and Interpretation

(1) In these regulations, unless the context otherwise requires,-

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

(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 equipment of the generating station, and transformer losses within the generating station, expressed as a percentage of the sum of gross energy generated at the generator terminals of all the units of the generating station;

(c) **'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;

[A][1A][2] *(d) '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 (H2) and traces of Methane (CH4), which is called producer gas;*

(e) 'Biogas' means a gas created when organic matter like crop residues, sewage and manure breaks down in an oxygen-free environment (ferments);][A]

[A][3] ~~(d)~~ **'Capital cost'** ~~means the capital cost as defined in regulations 2,24,28,34,47,57 and 61~~;

(f) Capital cost' means the capital cost as defined in regulations 12,24, 28, 34, 47, 57, 61, 66 and 76][A]

(g) **'Commission'** means the Joint Electricity Regulatory Commission for the states of Manipur and Mizoram constituted by Government of India notification that 18. 01. 2005 9under section 83 of the Act 2003

(h) **'Conduct of Business Regulations'** means the Joint Electricity Regulatory Commission for the states of Manipur and Mizoram (Conduct of Business) Regulations, 2010 as amended from time to time;

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

(j) **'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 litre of liquid fuel or one standard cubic meter of gaseous fuel, as the case may be;

(k) **'Gross station heat rate'** or 'GHR' means the heat energy input in kCal required to generate one kWh of electrical energy at generator terminals of a thermal generating station;

(l) **'Hybrid Solar Thermal Power Plant'** means the solar thermal power plant that uses other forms of 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.

(m) **'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 at the generator terminals), approved by the Commission from time to time;

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

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[1] Clauses (e), (f), (g), (h), (i), (j), (k), (l), (m), (n), (o), (p), (q), (r), (s), (t), (u), (v), (w), (x), (y) and (z) of the Principal Regulations shall be read as (g), (h), (i), (j), (k), (l), (m), (n), (o), (p), (q), (r), (s), (t), (u), (v), (w), (x), (y),(z),(aa) and (ab) respectively

[2] Added Clause (d) and (e) after Clause (c) of Regulation 2 (1), vide first amendment, 2014

[3] Omitted clause (d) and inserted clause (f) of Regulation 2 (1), vide first amendment, 2014

(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;

(o) **'MNRE'** means the Ministry of New and Renewable Energy of the Government of India.

(p) **'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.

(q) **'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 fulfills the eligibility criteria as specified in clause (4) of Regulation 4.

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

(s) **'Project'** means a generating station or the evacuation system upto inter-connection point, as the case may be, 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 apportioned to power generation;

(t) **'Renewable Energy'** means the grid quality electricity generated from renewable energy sources.

(u) **'Renewable Energy Power Plants'** means the power plants other than the conventional power plants generating grid quality electricity from renewable energy sources.

(v) **'Renewable Energy Sources'** means renewable sources such as small 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;

(w) **'Small Hydro'** means Hydro Power projects with a station capacity up to and including 25 MW.

(x) **'Solar PV power'** means the Solar Photo Voltaic power project that uses sunlight for direct conversion into electricity through Photo Voltaic technology.

(y) **'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.

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

[A][4](~~y) **'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 (COD) of such generation facility, namely:-~~

~~(a) Wind energy power project 25 years~~

[4] Omitted clause (y) and inserted clause (aa), vide First amendment (A), 2014

~~(b) Biomass power project, non-fossil fuel cogeneration 20 years~~

~~(c) Small Hydro Plant 35 years~~

~~(d) Solar PV/Solar thermal power plants 25 years~~

(aa) ***'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 (COD) of such generation facility, namely:-*

(a)	*Wind energy power project*	*25 years*
(b)	*Biomass power project with Rankine cycle technology*	*20 years*
(c)	*Non-fossil fuel cogeneration project*	*20 years*
(d)	*Small Hydro Plant*	*35 years*
(e)	*Solar PV/Solar thermal power project*	*25 years*
(f)	*Biomass Gasifier based power project*	*20 years*
(g)	*Biogas based power project*	*20 years]*[A]

(ab) **'Year'** means a financial year.][A]

(2) Save as aforesaid and unless repugnant to the context or if the subject matter otherwise requires, words and expressions used in these regulations and not defined, but defined in the Act, or the Indian Electricity Grid Code or the Joint Electricity Regulatory Commission for the states of Manipur and Mizoram for determination (Terms and conditions of Tariff) Regulations, 2010 shall have the meanings assigned to them respectively in the Act or the Indian Electricity Grid Code or the Joint Electricity Regulatory Commission for the states of Manipur and Mizoram (Terms and conditions for determination of Tariff) Regulations, 2010.

3 Scope and extent of application

These regulations shall apply in all cases where tariff, for a generating station or a unit thereof based on renewable sources of energy, is to be determined by the Commission under Section 62 read with Section 86 of the Act.

Provided that in cases of wind, small hydro projects, biomass power, non-fossil fuel based cogeneration projects, solar PV and Solar Thermal power projects, these regulations shall apply subject to the fulfillment of eligibility criteria specified in regulation 4 of these Regulations.

4 Eligibility Criteria

(1) **Wind power project** – located at the wind sites having minimum annual mean Wind Power Density (WPD) of 200 Watt/m² measured at hub height of 50 meters and using new wind turbine generators.

(2) **Small hydro project** – located at the sites approved by State Nodal Agency/ State Government using new plant and machinery, and installed power plant capacity to be lower than or equal to 25 MW at single location.

(3) **Biomass power project** – Biomass power projects using new plant and machinery based on Rankine cycle technology and using biomass fuel sources, provided use of fossil fuel is restricted only to 15% of total fuel consumption on annual basis.

(4) **Non-fossil fuel based co-generation project**: The project 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 and also meets the qualifying requirement outlined below:

Topping cycle mode of co-generation – Any facility that uses non-fossil fuel input for the power generation and also utilizes the thermal energy generated for useful heat applications in other industrial activities simultaneously. Provided that for the co-generation facility to qualify under topping cycle mode, the sum of useful power output and one half the useful thermal output be greater than 45% of the facility's energy consumption, during season."

Explanation - For the purposes of this clause,

(a) 'Useful power output' is the gross electrical output from the generator. There will be an auxiliary consumption in the cogeneration plant itself (e.g. the boiler feed pump and the FD/ID fans). In order to compute the net power output it would be necessary to subtract the auxiliary consumption from the gross output. For simplicity of calculation, the useful power output is defined as the gross electricity (kWh) output from the generator.

(b) 'Useful Thermal Output' is the useful heat (steam) that is provided to the process by the cogeneration facility.

(c) 'Energy Consumption' of the facility is the useful energy input that is supplied by the fuel [A][5]~~(normally biogases or other such biomass fuel).~~

(d) 'topping cycle' means a cogeneration process in which thermal energy produces electricity followed by useful heat application in industrial activities.][A]

(5) Solar PV and Solar Thermal Power Projects – Based on Technologies approved by MNRE.

[5] Omitted Regulation 4 (4) (c) and inserted 4 (4) (d), vide First amendment (A), 2014

CHAPTER-2
GENERAL PRINCIPLES

5 Control Period or Review Period

[A][6]~~The Control Period or Review Period under these Regulations shall be of Five years, of which the first year shall be the period from the date of notification of these regulations to 31.3.2011.~~

The Control Period or Review Period under these Regulations shall be of Five years, of which the first year shall be the financial year 2012-13.[A]

Provided that the benchmark capital cost for Solar PV and Solar thermal projects may be reviewed annually by the Commission.

Provided further that the tariff determined as per these Regulations for the 'RE projects except biomass power project and non-fossil fuel base Co-generation 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 revision in Regulations for next Control Period shall be undertaken at least 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 applicable until notification of the revised Regulations subject to adjustments as per revised Regulations.

6 Tariff Period

(1) The Tariff Period for Renewable Energy power projects except in case of Small hydro projects below 5 MW, Solar PV, and Solar thermal power projects shall be thirteen (13) years.

(2) In case of Small hydro projects below 5 MW, the tariff period shall be thirty five (35) years.

(3) In case of Solar PV and Solar thermal power projects the Tariff Period shall be twenty five years (25) years.

(4) Tariff period under these Regulations shall be considered from the date of commercial operation of the renewable energy generating stations.

(5) Tariff determined as per these Regulations shall be applicable for Renewable Energy power projects, only for the duration of the Tariff Period as stipulated under Regulation 6(1), (2) and (3).

7 Project Specific tariff

[A][7]~~(1) Project specific tariff, on case to case basis, shall be determined by the Commission for the following types of projects:~~

~~(a) Municipal Solid Waste Projects~~

[6] Omitted and inserted first para of Regulation 5, vide First amendment (A), 2014

[7] Omitted and inserted Regulation 7 (1), vide First amendment (A), 2014

~~(b) Any other new renewable energy technologies approved by MNRE~~

~~(c) The renewable energy projects which have been commissioned before the notification of these Regulations but for which no power purchase agreement has been signed until the date of notification of these Regulations.~~

~~(d) Solar PV and Solar Thermal Power projects, if a project developer opts for project specific tariff: Provided that the Commission while determining the project specific tariff for Solar PV and Solar Thermal shall be guided by the provisions of Chapters 7 and 8 of these Regulations.~~

~~(e) Hybrid Solar Thermal Power plants~~

~~(f) Biomass project other than that based on Rankine Cycle technology application with water cooled condenser.~~

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

i. Municipal Solid Waste Projects;

ii. Solar PV and Solar Thermal Power projects, if a project developer opts for project specific tariff:

Provided that the Commission while determining the project specific tariff for Solar PV and Solar Thermal shall be guided by the provisions of Chapters 8 & 9 of these Regulations.

iii. Hybrid Solar Thermal Power plants;

iv. Other hybrid projects include renewable–renewable or renewable – conventional sources, for which renewable technology is approved by MNRE;

v. Biomass project other than that based on Rankine Cycle technology application with water cooled condenser;

vi. Any other new renewable energy technologies approved by MNRE.][A]

(2) Determination of Project specific Tariff for generation of electricity from such renewable energy sources shall also consider such terms and conditions as stipulated under relevant Orders of the Commission.

Provided that the financial norms as specified under Chapter-2 of these Regulations, except for capital cost, shall be ceiling norms while determining the project specific tariff.

8 Petition and proceedings for determination of tariff

(1) The Commission shall determine the generic tariff on the basis of suo-motu petition at least six months in advance at the beginning of each year of the Control period for renewable energy technologies for which norms have been specified under the Regulations.

(2) A petition for determination of project specific tariff shall be accompanied by such fee as may be determined by regulations and shall be accompanied by

(a) Information in forms 1.1, 1.2, 2.1 and 2.2 as the case may be, and as appended in these regulations;

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

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

(d) A statement containing 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

(e) Any other information that the Commission requires the petitioner to submit.

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

9 Tariff Structure

(1) The tariff for renewable energy technologies shall be 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 renewable energy technologies having fuel cost component, like biomass power projects and non-fossil fuel based cogeneration, single part tariff with two components, fixed cost component and fuel cost component, shall be determined.

10 Tariff Design

(1) The generic tariff shall be determined on levellised basis for the Tariff Period.

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

(2) For the purpose of levellised tariff computation, the discount factor equivalent to weighted average cost of capital shall be considered.

(3) Levellisation shall be carried out for the 'useful life' of the Renewable Energy project while Tariff shall be specified for the period equivalent to 'Tariff Period'.

11 Despatch principles for electricity generated from Renewable Energy Sources:

(1) All renewable energy power plants except for biomass power plants with installed capacity of 10 MW and above, and non-fossil fuel based cogeneration plants shall be treated as 'MUST RUN' power plants and shall not be subjected to 'merit order despatch' principles.

(2) The biomass power generating station with an installed capacity of 10 MW and above and non-fossil fuel based co-generation projects shall be subjected to scheduling and despatch code as specified under Indian Electricity Grid Code (IEGC) and Central Electricity Regulatory Commission (Unscheduled Interchange and related matters) Regulations, 2009 including amendments thereto.

[A][8](3) Wind power generation plants where the sum of generation capacity of such plants connected at the connection point to the transmission or distribution system is 10 MW and above and connection point is 33 kV and above shall be subjected to scheduling and despatch code as specified under Indian Electricity Grid Code (IEGC) -2010, as amended from time to time.

(1) Solar generating plants with capacity of 5 MW and above and connected at the connection point of 33 kV level and above shall be subjected to scheduling and despatch code as specified under Indian Electricity Grid Code (IEGC) -2010, as amended from time to time.][A]

[8] Inserted a new clause (3) after clause (2) in Regulation 11, vide First amendment (A), 2014

CHAPTER-4
FINANCIAL PRINCIPLES

12 Capital Cost

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 and 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.

13 Debt Equity Ratio

(1) For generic tariff to be determined based on suo motu petition, the debt equity ratio shall be 70:30.

(2) For Project specific tariff, the following provisions shall apply: - 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 equity invested in foreign currency shall be designated in Indian rupees on the date of each investment.

14 Loan and Finance Charges

[A][9] ~~**(1) Loan Tenure.** For the purpose of determination of tariff, loan tenure of 10 years shall be considered.~~

(1) Loan Tenure: For the purpose of determination of tariff, loan tenure of 12 years shall be considered.][A]

(2) Interest Rate

(a) The loans arrived at in the manner indicated above shall be considered as gross normative loan for calculation for 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.

[A][10] ~~(b) For the purpose of computation of tariff, the normative interest rate shall be considered as average long term prime lending rate (LTPLR) of State Bank of India (SBI) prevalent during the previous year plus 150 basis points.~~

(b) For the purpose of computation of tariff, the normative interest rate shall be considered as average State Bank of India (SBI) Base rate prevalent during the first six months of the previous year plus 300 basis points.][A]

(c) 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.

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[9] Omitted and inserted clause (1) of Regulation 14, vide First amendment (A), 2014

[10] Omitted and inserted sub-clause (b) of clause (2) of Regulation 14, vide First amendment (A), 2014

15 Depreciation

(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.

A[11(~~2) Depreciation per annum shall be based on 'Differential Depreciation Approach' over loan tenure and period beyond loan tenure over useful life computed on 'Straight Line Method'. The depreciation rate for the first 10 years of the Tariff Period shall be 7% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 11th year onwards.~~

(2) Depreciation per annum shall be based on 'Differential Depreciation Approach' over loan tenure and period beyond loan tenure over useful life computed on 'Straight Line Method'. 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 13th year onwards.]A

(3) Depreciation shall be chargeable from the first year of commercial operation. Provided that in case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.

16 Return on Equity

A[12(~~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.~~

(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.]A

A[13(~~2) The normative Return on Equity shall be:~~

~~(a) Pre-tax 19% per annum for the first 10 years.~~

~~(b) Pre-tax 24% per annum 11th years onwards.~~

(2) The normative Return on Equity shall be:

a) 20% per annum for the first 10 years.

b) 24% per annum 11th years onwards.]A

17 Interest on Working Capital

(1) The Working Capital requirement in respect of wind energy projects, Small hydro power, Solar PV and Solar thermal power projects shall be computed in accordance with the following:

Wind Energy / Small Hydro Power /Solar PV / Solar thermal

(a) Operation & Maintenance expenses for one month;

(b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative CUF;

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[11] Omitted and inserted clause (2) of Regulation 15, vide First amendment (A), 2014

[12] Omitted and inserted clause (1) of Regulation 16, vide First amendment (A), 2014

[13] Omitted and inserted clause (2) of Regulation 16, vide First amendment (A), 2014

(c) Maintenance spare @ 15% of operation and maintenance expenses

(2) The Working Capital requirement in respect of biomass power projects and non-fossil fuel based co-generation projects shall be computed in accordance with the following clause:

Biomass Power and Non-fossil fuel Co-generation

(a) Fuel costs for four months equivalent to normative PLF;

(b) Operation & Maintenance expense for one month;

(c) Receivables equivalent to 2 (Two) months of fixed and variable charges for sale of electricity calculated on the target PLF;

(d) Maintenance spare @ 15% of operation and maintenance expenses

[A][14]~~(3) Interest on Working Capital shall be at interest rate equivalent to average State Bank of India short term PLR during the previous year plus 100 basis points.~~

(3) Interest on Working Capital shall be at interest rate equivalent to the average State Bank of India Base Rate prevalent during the first six months of the previous year plus 350 basis points.][A]

18 Operation and Maintenance Expenses

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

(2) Operation and maintenance 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.

[A][15]~~(3) Normative O&M expenses allowed during first year of the Control Period (i.e. FY 2010-11) under these Regulations shall be escalated at the rate of 5.72% per annum over the Tariff Period.~~

(3) Normative O&M expenses allowed during first year of the Control Period (i.e. FY 2012-13) under these Regulations shall be escalated at the rate of 5.72% per annum over the Tariff Period.][A]

19 Rebate.

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

(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.

[14] Omitted and inserted clause (3) of Regulation 17, vide First amendment (A), 2014

[15] Omitted and inserted clause (3) of Regulation 18, vide First amendment (A), 2014

In case the payment of any bill for charges payable under these regulations is delayed beyond a period of 60 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 Sharing of CDM Benefits

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialised countries with a greenhouse gas reduction commitment to invest in ventures that reduce emissions in developing countries as an alternative to more expensive emission reductions in their own countries.

(1) The proceeds of carbon credit from approved CDM project shall be shared between generating company and concerned beneficiaries in the following manner, namely-

(a) 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;

(b) 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.

22 Subsidy or incentive by the Central / State Government

The Commission shall take into consideration any incentive or subsidy 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 tariff under these Regulations.

Provided that the following principles shall be considered for ascertaining income tax benefit on account of accelerated depreciation, if availed, for the purpose of tariff determination:

(1) Assessment of benefit shall be based on normative capital cost, accelerated depreciation rate as per relevant provisions under Income Tax Act and corporate income tax rate.

(2) Capitalisation of RE projects during second half of the fiscal year.

Per unit benefit shall be derived on levellised basis at discount factor equivalent to weighted average cost of capital.

23 Taxes and Duties

Tariff determined under these regulations shall be exclusive of taxes and duties as may be levied by the appropriate Government:

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

CHAPTER-5
TECHNOLOGY SPECIFIC PARAMETERS FOR WIND ENERGY

24 Capital Cost

(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.

[A][16] ~~(2) The capital cost for wind energy projects shall be Rs.600 Lakhs/MW (FY 2010- 11) during first year of Control Period) and shall be linked to indexation formula as outlined under Regulation 25.~~

(2) The capital cost for wind energy projects shall be Rs 575/- Lakh/MW (FY 2012-13 during first year of Control Period) and shall be linked to indexation formula as outlined under Regulation 25.][A]

25 Capital Cost Indexation Mechanism

[A][17] ~~The following indexation mechanism shall be applicable in case of wind energy projects for adjustments in capital cost over the Control Period with the changes in Wholesale Price Index for Steel and Electrical Machinery.~~

~~$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$~~

~~$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$~~

~~$d_{(n)} = [a*\{(SI_{(n-1)}/SI_{(0)}) - 1\} + b*\{(EI_{(n-1)}/EI_{(0)}) - 1\}]/(a+b)$~~

~~Where,~~

~~$CC_{(n)}$ = Capital Cost for n^{th} year~~

~~$P\&M_{(n)}$ = Plant and Machinery Cost for n^{th} year~~

~~$P\&M_{(0)}$ = Plant and Machinery Cost for the base year~~

~~**Note**: $P\&M_{(0)}$ is to be computed by dividing the base capital cost (for the first year of the control period) by $(1+F_1+F_2+F3)$ i.e. Rs. 600 lakh per MW / 1.25 = Rs. 480 Lakh per MW.~~

~~$d_{(n)}$ = Capital Cost escalation factor for year (n) of Control Period~~

~~$SI_{(n-1)}$ = Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period~~

~~$SI_{(0)}$ = Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. January 2009 to December 2009.~~

~~$EI_{(n-1)}$ = Average WPI Electrical Machinery Index prevalent for calendar year (n- 1) of the Control Period~~

~~$EI_{(0)}$ = Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the year of the Control Period i.e. January 2009 to December 2009~~

~~a = Constant to be determined by Commission from time to time, (In default it is 0.6), for weightage to Steel Index~~

~~b = Constant to be determined by Commission from time to time, (In default it is 0.4), for weightage to Electrical Machinery Index~~

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[16] Omitted and inserted clause (2) of Regulation 24, vide First amendment (A), 2014

[17] Omitted and inserted Regulation 25, vide First amendment (A), 2014

~~F_1 = Factor for Land and Civil Works (0.08)~~

~~F_2 = Factor for Erection and Commissioning (0.07)~~

~~F_3 = Factor for IDC and Financing Cost (0.10)~~

The following indexation mechanism shall be applicable in case of wind energy projects for adjustments in capital cost over the Control Period with the changes in Wholesale Price Index for Steel and Electrical Machinery.

$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$

$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$

$d_{(n)} = [a*\{(SI_{(n-1)} /SI_{(0)}) – 1\} + b*\{(EI_{(n-1)} /EI_{(0)}) – 1\}]/(a+b)$

Where,

$CC_{(n)}$ = *Capital Cost for n^{th} year*

$P\&M_{(n)}$ = *Plant and Machinery Cost for n^{th} year*

$P\&M_{(0)}$ = *Plant and Machinery Cost for the base year*

***Note**: $P\&M_{(0)}$ is to be computed by dividing the base capital cost (for the first year of the control period) by $(1+F_1+F_2+F3)$ i.e. Rs.575 lakh per MW / 1.25 = Rs. 460 Lakh per MW.*

$d_{(n)}$ = *Capital Cost escalation factor for year (n) of Control Period*

$SI_{(n-1)}$ = *Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period*

$SI_{(0)}$ = *Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012.*

$EI_{(n-1)}$ = *Average WPI Electrical Machinery Index prevalent for calendar year (n- 1) of the Control Period*

$EI_{(0)}$ = *Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the year of the Control Period i.e. April 2011 to March 2012.*

a = *Constant to be determined by Commission from time to time, (In default it is 0.6), for weightage to Steel Index*

b = *Constant to be determined by Commission from time to time, (In default it is 0.4), for weightage to Electrical Machinery Index*

F_1 = *Factor for Land and Civil Works (0.08)*

F_2 = *Factor for Erection and Commissioning (0.07)*

F_3 = *Factor for IDC and Financing Cost (0.10)]*[A]

26 Capacity Utilisation Factor:

~~(1)~~ [A][18]C~~UF norms for this control period shall be as follows:~~

~~Annual Mean Wind Power Density~~	~~CUF~~

[18] Omitted and inserted clause (1) of Regulation 26, vide First amendment (A), 2014

~~(W/m2)~~	
~~200-250~~	~~20%~~
~~250-300~~	~~23%~~
~~300-400~~	~~27%~~
~~> 400~~	~~30%~~][A]

(1) CUF norms for this control period shall be as follows:

Annual Mean Wind Power Density (W/m2)	CUF
Upto 200	20%
201-250	22%
251-300	25%
301-400	30%
> 400	32%

A[[19]~~(2) The annual mean wind power density specified in sub-regulation (1) above shall be measured at 50 meter hub-height.~~

(2) The annual mean wind power density specified in sub-regulation (1) above shall be measured at 80 meter hub-height.][A]

A[[20]~~(3) For the purpose of classification of wind energy project into particular wind zone class, the State-wise wind power density map prepared by Centre for Wind Energy Technology (C-WET) and enclosed as Schedule to these Regulations, shall be considered.~~

~~Provided that the Commission may by notification in official gazette, amend the schedule from time to time, based on the input provided by C-WET/ MNRE.~~

(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 C-WET or a private developer and validated by C-WET 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 C-WET, State Nodal Agency should certify zoning of the proposed wind farm complex.][A]

27 Operation and Maintenance Expenses

A[[21]~~(1) Normative O&M expenses for the first year of the Control Period (i.e. FY 2010- 11) shall be Rs 7.50 Lakh per MW.~~

[19] Omitted and inserted clause (2) of Regulation 26, vide First amendment (A), 2014

[20] Omitted and inserted clause (3) of Regulation 26, vide First amendment (A), 2014

[21] Omitted and inserted clause (1) of Regulation 27, vide First amendment (A), 2014

(1) Normative O&M expenses for the first year of the Control Period (i.e. FY 2012-13) shall be Rs 9/- Lakh per MW.][A]

(2) Normative O&M expenses allowed under these Regulations shall be escalated at the rate of 5.72% per annum over the tariff period to compute the levellised tariff.][A]

CHAPTER-6
TECHNOLOGY SPECIFIC PARAMETERS FOR SMALL HYDRO PROJECT

28 Capital Cost

~~(1) The normative capital cost for small hydro projects during first year of Control Period (FY 2010-11) shall be as follows:~~

~~Sl. No~~	~~Project Size~~	~~Capital Cost (Rs in Lakh/MW)~~
~~1~~	~~Below 5 MW~~	~~812~~
~~2~~	~~5 MW to 25 MW~~	~~730~~

[A][22](1) The normative capital cost for small hydro projects during first year of Control Period (FY 2012-13) shall be as follows:

Sl. No	*Project Size*	*Capital Cost (Rs in Lakh/MW)*
1	*Below 5 MW*	*770*
2	*5 MW to 25 MW*	*700][A]*

(2) The capital cost for subsequent years shall be determined on the basis of indexation formula as outlined under Regulation 29.

29 Capital Cost Indexation Mechanism

*[A][23]~~The following indexation mechanism shall be applicable in case of small hydro power projects for adjustments in capital cost over the Control Period with the changes in Wholesale Price Index for Steel and Electrical Machinery.~~

~~$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$~~

~~$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$~~

~~$d_{(n)} = [a*((SI_{(n-1)}/SI_{(0)}) - 1) + b*((EI_{(n-1)}/EI_{(0)}) - 1)]/(a+b)$~~

~~Where,~~

~~$CC_{(n)}$ = Capital Cost for n^{th} year~~

~~$P\&M_{(n)}$ = Plant and Machinery Cost for n^{th} year~~

~~$P\&M_{(0)}$ = Plant and Machinery Cost for the base year~~

~~**Note.** $P\&M_{(0)}$ is to be computed by dividing the base capital cost (for the first year of the control period) by $(1+F_1+F_2+F_3)$ i.e.~~

~~Small hydro Project~~	~~Base Capital Cost (Rs. Lakh/MW)~~	~~Factor $(1+F_1+F_2+F_3)$~~	~~P&M (0) Rs. Lakh/MW)~~

[22] Omitted and inserted clause (1) of Regulation 28, vide First amendment (A), 2014

[23] Omitted and inserted Regulation 29, vide First amendment (A), 2014

~~SHP (<5MW)~~	~~812~~	~~1.40~~	~~580~~
~~SHP (5 - 25 MW)~~	~~730~~	~~1.40~~	~~521~~

~~$d_{(n)}$ = Capital Cost escalation factor for year (n) of Control Period~~

~~$SI_{(n-1)}$ = Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period~~

~~$SI_{(0)}$ = Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. January 2009 to December 2009~~

~~$EI_{(n-1)}$ = Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period~~

~~$EI_{(0)}$ = Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. January 2009 to December 2009~~

~~a = Constant to be determined by Commission from time to time, (In default it is 0.6), for weightage to Steel Index~~

~~b = Constant to be determined by Commission from time to time, (In default it is 0.4), for weightage to Electrical Machinery Index~~

~~F_1 = Factor for Land and Civil Work (0.16)~~

~~F_2 = Factor for Erection and Commissioning (0.10)~~

~~F_3 = Factor for IDC and Financing Cost (0.14)~~

The following indexation mechanism shall be applicable in case of small hydro power projects for adjustments in capital cost over the Control Period with the changes in Wholesale Price Index for Steel and Electrical Machinery.

$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$

$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$

$d_{(n)} = [a*\{(SI_{(n-1)}/SI_{(0)}) - 1\}+ b*\{(EI_{(n-1)}/EI_{(0)}) -1\}]/(a+b)$

Where,

$CC_{(n)}$ = *Capital Cost for n^{th} year*

$P\&M_{(n)}$ = *Plant and Machinery Cost for n^{th} year*

$P\&M_{(0)}$ = *Plant and Machinery Cost for the base year*

Note: *$P\&M_{(0)}$ is to be computed by dividing the base capital cost (for the first year of the control period) by $(1+F_1+F_2+F_3)$ i.e.*

Small hydro Project	*Base Capital Cost (Rs. Lakh/MW)*	*Factor $(1+F_1+F_2+F_3)$*	*P&M (0) (Rs. Lakh/MW)*
SHP (<5MW)	*770*	*1.40*	*550*
SHP (5 - 25 MW)	*700*	*1.40*	*500*

$d_{(n)}$ = *Capital Cost escalation factor for year (n) of Control Period*

$SI_{(n-1)}$ = *Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period*

$SI_{(0)}$ = *Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

$EI_{(n-1)}$ = *Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period*

$EI_{(0)}$ = *Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

a = *Constant to be determined by Commission from time to time, (In default it is 0.6), for weightage to Steel Index*

b = *Constant to be determined by Commission from time to time, (In default it is 0.4), for weightage to Electrical Machinery Index*

F_1 = *Factor for Land and Civil Work (0.16)*

F_2 = *Factor for Erection and Commissioning (0.10)*

F_3 = *Factor for IDC and Financing Cost (0.14)]*[A]

30 Capacity Utilisation Factor

[A][24]~~Capacity Utilisation factor for the small hydro projects in Manipur and Mizoram shall be 40%.~~

~~**Explanation**: For the purpose of this Regulation normative CUF is net of free power to the home state if any, and any quantum of free power if committed by the developer over and above the normative CUF shall not be factored into the tariff.~~

Capacity Utilisation factor for the small hydro projects in Manipur and Mizoram shall be read as 45% instead of 40% under Regulation 30 of the Principal Regulations.][A]

31 Auxiliary Consumption

Normative Auxiliary Consumption for the small hydro projects shall be 1.0%.

32 Operation and Maintenance Expenses

[A][25](1) ~~Normative O&M expenses for the first year of the Control period (i.e. FY 2010- 11) shall be as follows.~~

~~**Sl. No**~~	~~**Project Size**~~	~~**O&M Expense (Rs Lakh/ MW)**~~
~~1~~	~~Below 5 MW~~	~~24~~
~~2~~	~~5 MW to 25 MW~~	~~17~~

(1) *Normative O&M expenses for the first year of the Control period (i.e. FY 2012- 13) shall be as follows.*

Sl. No	***Project Size***	***O&M Expense (Rs Lakh/ MW)***
1	*Below 5 MW*	*25*

[24] Omitted and inserted Regulation 30, vide First amendment (A), 2014

[25] Omitted and inserted clause (1) of Regulation 32, vide First amendment (A), 2014

2	*5 MW to 25 MW*	*18[A]*

(2) Normative O&M expenses allowed under these Regulations shall be escalated at the rate of 5.72% per annum for the Tariff Period for the purpose of determination of levellised tariff.

CHAPTER- 7
TECHNOLOGY SPECIFIC PARAMETERS FOR BIOMASS BASED POWER PROJECTS

33 Technology Aspect

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

[A][26]~~The normative capital cost for the biomass power projects shall be Rs.520 Lakh/MW (FY 2010 -11 during first year of Control Period) and shall be linked to indexation formula as outlined under Regulation 35.~~

The normative capital cost for the biomass power projects based on Rankine cycle shall be as under:

a. *Rs 540 lakh/MW for project [other than rice straw and juliflora (plantation) based project] with water cooled condenser;*
b. *Rs 580 lakh/MW for Project [other than rice straw and Juliflora (plantation) based project] with air cooled condenser;*
c. *Rs 590 lakh/MW for rice straw and juliflora (plantation) based project with water cooled condenser;*
d. *Rs 630 lakh/MW for rice straw and juliflora (plantation) based project with air cooled condenser.]*[A]

35 Capital Cost Indexation Mechanism

[A][27]~~The following indexation mechanism shall be applicable in case of biomass power projects for adjustment in capital cost over the Control Period with the changes in Wholesale Price Index for Steel and Electrical Machinery.~~

~~$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$~~

~~$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$~~

~~$d_{(n)} = [a*\{(SI_{(n-1)} / SI_{(0)}) -1\} + b*\{(EI_{(n-1)}/EI_{(0)}) -1\}]/(a+b)$~~

~~Where,~~

~~$CC_{(n)}$ = Capital Cost for nth year~~

~~$P\&M_{(n)}$ = Plant and Machinery Cost for nth year~~

~~$P\&M_{(0)}$ = Plant and Machinery Cost for the base year~~

~~**Note:** $P\&M_{(0)}$ is to be computed by dividing the base capital cost (for the first year of the control period) by $(1+F_1+F_2+F_3)$ i.e. Rs. 520 Lakh per MW / 1.33 = Rs 391 Lakh per MW.~~

~~$d_{(n)}$ = Capital Cost escalation factor for year (n) of Control Period~~

~~$SI_{(n-1)}$ = Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period~~

[26] Omitted and inserted Regulation 34, vide First amendment (A), 2014
[27] Omitted and inserted Regulation 35, vide First amendment (A), 2014

~~$SI_{(0)}$ = Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. January 2009 to December 2009~~

~~$EI_{(n-1)}$ = Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period~~

~~$EI_{(0)}$ = Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. January 2009 to December 2009~~

~~a = Constant to be determined by Commission from time to time, (In default it is 0.7), for weightages to Steel Index~~

~~b = Constant to be determined by Commission from time to time, (In default it is 0.3), for weightages to Electrical Machinery Index~~

~~F_1 = Factor for Land and Civil Works (0.10)~~

~~F_2 = Factor for Erection and Commissioning (0.09)~~

~~F_3 = Factor for IDC and Financing Cost (0.14)~~

The following indexation mechanism shall be applicable in case of biomass power projects for adjustment in capital cost over the Control Period with the changes in Wholesale Price Index for Steel and Electrical Machinery,

$$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$$

$$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$$

$$d_{(n)} = [a*\{(SI_{(n-1)} / SI_{(0)}) -1\} + b*\{(EI_{(n-1)}/EI_{(0)}) -1\}]/(a+b)$$

Where,

$CC_{(n)}$ = *Capital Cost for nth year*

$P\&M_{(n)}$ = *Plant and Machinery Cost for nth year*

$P\&M_{(0)}$ = *Plant and Machinery Cost for the base year*

Note: $P\&M_{(0)}$ *is to be computed by dividing the base capital cost (for the first year of the control period) by* $(1+F_1+F_2+F_3)$

$d_{(n)}$ = *Capital Cost escalation factor for year (n) of Control Period*

$SI_{(n-1)}$ = *Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period*

$SI_{(0)}$ = *Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

$EI_{(n-1)}$ = *Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period*

$EI_{(0)}$ = *Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

a = *Constant to be determined by Commission from time to time, (In default it is 0.7), for weightages to Steel Index*

b = *Constant to be determined by Commission from time to time, (In default it is 0.3), for weightages to Electrical Machinery Index*

F_1 = *Factor for Land and Civil Works (0.10)*

F_2 = *Factor for Erection and Commissioning (0.09)*

F_3 = *Factor for IDC and Financing Cost (0.14)]*[A]

36 Plant Load Factor

(1) Threshold Plant Load Factor for determining fixed charge component of Tariff shall be:

(a) During Stabilisation: 60%

(b) During the remaining period of the first year (after stabilization) : 70%

(c) From 2nd Year onwards: 80 %

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

37 Auxiliary Consumption

A[28~~The auxiliary power consumption factor shall be 10% for the determination of tariff.~~

The auxiliary power consumption shall be as under:

(a) For the project using water cooled condenser:

(i) During first year of operation: 11%;

(ii) From 2nd year onwards: 10%.

(b) For the project using air cooled condenser:

(i) During first year of operation: 13%;

(ii) From 2nd year onwards: 12%.]A

38 Station Heat Rate

A[29~~The Station Heat Rate for biomass power projects shall be 3800 kCal / kWh~~

The Station Heat Rate for biomass power projects shall be as under:

(a) 4200 kcal/kWh for project using travelling grate boilers;

(b) 4125 kcal/kWh for project using AFBC boilers.]A

39 Operation and Maintenance Expenses

A[30~~(1) Normative O&M expenses for the first year of the Control period (i.e. FY 2010- 11) shall be Rs. 23.00 Lakh per MW.~~

~~(2) Normative O&M expenses allowed at the commencement of the Control Period (i.e. FY 2010-11) under these Regulations shall be escalated at the rate of 5.72% per annum.~~

(1) Normative O&M expenses for the second year of the Control period (i.e. FY 2013-14 shall be Rs 40 lakh/MW.

(2) Normative O&M expenses allowed at the commencement of the Control Period (i.e. FY 2012-13) under these Regulations shall be escalated at the rate of 5.72% per annum.]A

40 Fuel Mix

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[28] Omitted and inserted Regulation 37, vide First amendment (A), 2014

[29] Omitted and inserted Regulation 38, vide First amendment (A), 2014

[30] Omitted and inserted Regulation 39, vide First amendment (A), 2014

(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.

(2) The Biomass Power Generating Companies shall ensure fuel management plan to ensure adequate availability of fuel to meet the respective project requirements.

41 Use of Fossil Fuel

[A][31]~~The use of fossil fuels shall be limited to the extent of 15% of total fuel consumption on annual basis.~~

The use of fossil fuels shall not be allowed.][A]

42 Monitoring Mechanism for the use of fossil fuel

(1) The Project developer shall furnish a monthly fuel usage statement and monthly fuel procurement statement duly certified by Chartered Accountant to the beneficiary (with a copy to appropriate agency 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 -

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

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

(c) Actual (gross and net) energy generation (denominated in units) during the month,

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

(e) Opening fuel stock quantity (in tonnes),

(f) Receipt of fuel quantity (in tonnes) at the power plant site and

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

(2) Non-compliance with the condition of fossil fuel usage by the project developer, during any financial year, shall result in withdrawal of applicability of tariff as per these Regulations for such biomass based power project.

43 Calorific Value

[A][32]~~The Calorific Value of the biomass fuel used for the purpose of determination of tariff shall be 3467 kCal/kg.~~

The Calorific Value of the biomass fuel used for the purpose of determination of tariff shall be at 3100 kcal/kg.][A]

[31] Omitted and inserted Regulation 41, vide First amendment (A), 2014

[32] Omitted and inserted Regulation 43, vide First amendment (A), 2014

44 Fuel Cost:

[A][33]~~Biomass fuel price during first year of the Control Period (i.e. FY 2010 - 11) shall be Rs. 2084/= per M.T and shall be linked to index formulae as specified under Regulation 45. Alternatively, for each subsequent year of the Tariff Period, the normative escalation factor of 5% per annum shall be applicable at the option of the biomass project developer.~~

Biomass fuel price during first year of the Control Period (i.e. FY 2012-13) shall be Rs. 2476/- per tonne and shall be linked to index formulae as specified under Regulation 45. Alternatively, for each subsequent year of the Tariff Period, the normative escalation factor of 5% per annum shall be applicable at the option of the biomass project developer. Alternatively, biomass fuel price shall be decided annually by the appropriate Regulatory Commission through an independent survey which could be carried out by constituting a State level committee consisting of representatives of State Nodal Agency, State Government, Distribution Licensees, biomass power producers association and any other organization.][A]

45 Fuel Price Indexation Mechanism

[A][34](1) ~~In case of biomass power projects, the following indexing mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of applicable variable charge component of tariff, in case developer wishes to opt for indexing mechanism:~~

~~$P_{(n)} = P_{(n-1)} * \{a * (WPI_{(n)}/WPI_{(n-1)}) + b * (1+IRC_{(n-1)}) + c * (Pd_{(n)}/Pd_{(n-1)})\}$~~

~~Where~~

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

~~$P_{(n-1)}$ = Price per ton of biomass for the $(n-1)^{th}$ year to be considered for tariff determination. P_1 shall be Biomass price for FY 2010-11 as specified under Regulation 44.~~

~~a = Factor representing fuel handling cost~~

~~b = Factor representing fuel cost~~

~~c = Factor representing transportation cost~~

~~$IRC_{(n-1)}$ = Average Annual Inflation Rate for indexed energy charge component in case of captive coal mine source (in %) to be applicable for $(n-1)^{th}$ year, as may be specified by CERC for 'Payment purpose' as per Competitive Bidding Guidelines~~

~~Pd_n = Weighted average price of HSD for nth year.~~

~~Pd_{n-1} = Weighted average price of HSD for $(n-1)^{th}$ year.~~

~~WPI_n = Whole sale price index for the month of April of n^{th} year~~

~~WPI_{n-1} = Wholesale price index for month of April of $(n-1)^{th}$ year.~~

~~Where a, b & c will be specified by the Commission from time to time. In default, these factors shall be 0.2, 0.6 & 0.2 respectively.~~

~~(2) Variable Charge for the nth year shall be determined as under:~~

~~i.e. $VC_n = VC_1 x (P_n / P_1)$ or $VC_n = VC_1 x (1.05)^{(n-1)}$ (optional)~~

~~where,~~

[33] Omitted and inserted Regulation 44, vide First amendment (A), 2014

[34] Omitted and inserted Regulation 45, vide First amendment (A), 2014

~~VC_1 represents the Variable Charge based on Biomass Price $P_1$for FY 2010 -11 as specified under Regulation 44 and shall be determined as under:~~

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{\text{(1–Aux Consum. Factor)}} \times \frac{P1}{1000}$$

(1) In case of biomass power projects, the following indexing mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of applicable variable charge component of tariff, in case developer wishes to opt for indexing mechanism:

$P_{(n)} = P_{(n-1)} * \{a * (WPI_{(n)}/WPI_{(n-1)}) + b * (1+IRC_{(n-1)}) + c * (Pd_{(n)}/Pd_{(n-1)})\}$

Where

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

$P_{(n-1)}$ = *Price per ton of biomass for the $(n-1)^{th}$ year to be considered for tariff determination. P_1 shall be Biomass price for FY 2012-13 as specified under Regulation 44.*

a = *Factor representing fuel handling cost*

b = *Factor representing fuel cost*

c = *Factor representing transportation cost*

$IRC_{(n-1)}$ = *Average Annual Inflation Rate for indexed energy charge component in case of captive coal mine source (in %) to be applicable for $(n-1)^{th}$ year, as may be specified by CERC for 'Payment purpose' as per Competitive Bidding Guidelines*

Pd_n = *Weighted average price of HSD for nth year.*

Pd_{n-1} = *Weighted average price of HSD for $(n-1)^{th}$ year.*

WPI_n = *Whole sale price index for the month of April of n^{th} year*

WPI_{n-1} = *Wholesale price index for month of April of $(n-1)^{th}$ year.*

Where a, b & c will be specified by the Commission from time to time. In default, these factors shall be 0.2, 0.6 & 0.2 respectively.

(2) Variable Charge for the nth year shall be determined as under:

i.e. $VC_n = VC_1 x (P_n / P_1)$ or $VC_n = VC_1 x (1.05)^{(n-1)}$ (optional)

Where,

VC_1 represents the Variable Charge based on Biomass Price $P_1$for FY 2012 -13 as specified under Regulation 44 and shall be determined as under:

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{\text{(1–Aux Consum. Factor)}} \times \frac{P1}{1000}$$

(3) The biomass base price shall be revised at the end of third year of the control period and same shall also be applicable to project commissioned under this Control Period.][A]

CHAPTER-8

TECHNOLOGY SPECIFIC PARAMETERS FOR NON-FOSSIL FUEL BASED CONGENERATION PROJECTS

46 Technology Aspect

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).

47 Capital Cost

[A][35] ~~The normative capital cost for the non-fossil fuel based cogeneration projects shall be Rs.516 Lakh/MW for the first year of Control Period (i.e. FY 2010 -11), and shall be linked to indexation formula as outlined under Regulation 48.~~

The normative capital cost for the non-fossil fuel based cogeneration projects shall be Rs.420 Lakh/MW for the first year of Control Period (i.e. FY 2012 -13), and shall be linked to indexation formula as outlined under Regulation 48.[A]

48 Capital Cost Indexation Mechanism

[A][36] ~~The following indexation mechanism shall be applicable in case of non-fossil fuel based cogeneration projects for adjustments in capital cost with the changes in Wholesale Price Index for Steel and Electrical Machinery,~~

~~$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$~~

~~$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$~~

~~$d_{(n)} = [a*\{(SI_{(n-1)}/SI_{(0)}) - 1\} + b*\{(EI_{(n-1)}/EI_{(0)}) - 1\}]/(a+b)$~~

~~Where,~~

~~$CC_{(n)}$ = Capital Cost for n^{th} year~~

~~$P\&M_{(n)}$ = Plant and Machinery Cost for n^{th} year~~

~~$P\&M_{(0)}$ = Plant and Machinery Cost for the base year~~

~~**Note.** $P\&M_{(0)}$ is to be computed by dividing the base capital cost (for the first year of the control period) by $(1+F_1+F_2+F_3)$ i.e. Rs. 516 Lakh per MW / 1.33 = Rs 388 Lakh/MW.~~

~~$d_{(n)}$ = Capital Cost escalation factor for year (n) of Control Period~~

~~$SI_{(n-1)}$ = Average WPI Steel Index prevalent for fiscal year (n-1) of the Control Period~~

~~$SI_{(0)}$ = Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. January 2009 to December 2009~~

~~$EI_{(n-1)}$ = Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period~~

~~$EI_{(0)}$ = Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. January 2009 to December 2009~~

~~a = Constant to be determined by Commission from time to time, (In default it is 0.7), for weightages to Steel Index~~

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[35] Omitted and inserted Regulation 47, vide First amendment (A), 2014

[36] Omitted and inserted Regulation 48, vide First amendment (A), 2014

~~b = Constant to be determined by Commission from time to time, (In default it is 0.3), for weightages to Electrical Machinery Index~~

~~F_1 = Factor for Land and Civil Work (0.10)~~

~~F_2 = Factor for Erection and Commissioning (0.09)~~

~~F_3 = Factor for IDC and Financing Cost (0.14)~~

The following indexation mechanism shall be applicable in case of non-fossil fuel based cogeneration projects for adjustments in capital cost with the changes in Wholesale Price Index for Steel and Electrical Machinery,

$$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$$

$$P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$$

$$d_{(n)} = [a*\{(SI_{(n-1)}/SI_{(0)}) -1\} + b*\{(EI_{(n-1)}/EI_{(0)}) - 1\}]/(a+b)$$

Where,

$CC_{(n)}$ = *Capital Cost for n^{th} year*

$P\&M_{(n)}$ = *Plant and Machinery Cost for n^{th} year*

$P\&M_{(0)}$ = *Plant and Machinery Cost for the base year*

Note: *$P\&M_{(0)}$ is to be computed by dividing the base capital cost (for the first year of the control period) by $(1+F_1+F_2+F_3)$*

$d_{(n)}$ = *Capital Cost escalation factor for year (n) of Control Period*

$SI_{(n-1)}$ = *Average WPI Steel Index prevalent for fiscal year (n-1) of the Control Period*

$SI_{(0)}$ = *Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

$EI_{(n-1)}$ = *Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period*

$EI_{(0)}$ = *Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

a = *Constant to be determined by Commission from time to time, (In default it is 0.7), for weightages to Steel Index*

b = *Constant to be determined by Commission from time to time, (In default it is 0.3), for weightages to Electrical Machinery Index*

F_1 = *Factor for Land and Civil Work (0.10)*

F_2 = *Factor for Erection and Commissioning (0.09)*

F_3 = *Factor for IDC and Financing Cost (0.14)]*[A]

49 Plant Load Factor

(1) For the purpose of determining fixed charge, the plant load factor for non-fossil fuel based cogeneration 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 clause (2) below and load factor of 92%.

(2) The number of operating days for Manipur and Mizoram shall be as follows:

50 Auxiliary Consumption

The auxiliary power consumption factor shall be 8.5% for the computation of tariff.

51 Station Heat Rate

The Station Heat Rate of 3600 kCal / kWh for power generation component alone shall be considered for computation of tariff for non-fossil fuel based Cogeneration projects.

52 Calorific Value

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.

53 Fuel Cost

[A][37](1) ~~The price of Bagasse shall be Rs. 1350/-per M.T and shall be linked to index formulae as outlined under Regulation 54. Alternatively, for each subsequent year of the Control Period, the normative escalation factor of 5% per annum shall be applicable at the option of the project developer.~~

(1) The price of Bagasse shall be Rs. 1583/-per M.T and shall be linked to index formulae as outlined under Regulation 54. Alternatively, for each subsequent year of the Control Period, the normative escalation factor of 5% per annum shall be applicable at the option of the project developer.][A]

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

54 Fuel Price Indexation Mechanism

[A][38](1) ~~In case of non-fossil fuel based cogeneration projects, the following indexing mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of applicable variable charge component of tariff, in case developer wishes to opt for indexing mechanism:~~

~~$P_{(n)} = P_{(n-1)} * \{a * (WPI_{(n)} / WPI_{(n-1)}) + b * (1+IRC_{(n-1)}) + c * (Pd_{(n)} / Pd_{(n-1)})\}$~~

~~Where~~

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

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

~~P1 shall be Biomass price for FY 2010 -11 as specified under Regulation 55.~~

~~a = Factor representing fuel handling cost~~

~~b = Factor representing fuel cost~~

~~c = Factor representing transportation cost~~

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[37] Omitted and inserted clause (1) of Regulation 53, vide First amendment (A), 2014

[38] Omitted and inserted Regulation 54, vide First amendment (A), 2014

~~$IRC_{(n-1)}$ = Average Annual Inflation Rate for indexed energy charge component in case of captive coal mine source (in %) to be applicable for (n- 1)th year, as may be specified by CERC for 'Payment purpose' as per Competitive Bidding Guidelines~~

~~Pd_n = Weighted average price of HSD for nth year.~~

~~Pd_{n-1} = Weighted average price of HSD for (n-1)th year.~~

~~WPI_n = Whole sale price index for the month of April of nth year~~

~~WPI_{n-1} = Wholesale price index for month of April of (n-1)th year.~~

~~Where a, b & c will be specified by the Commission from time to time. In default, these factors shall be 0.2, 0.6 & 0.2 respectively.~~

~~(2) Variable Charge for the nth year shall be determined as under:~~

~~i.e. $VC_n = VC_1 \times (P_n / P_1)$ or $VC_n = VC_1 \times (1.05)^{(n-1)}$ (optional)~~

~~where,~~

~~VC_1 represents the Variable Charge based on bagasse Price P_1 for FY 2010-11 as specified under Regulation 55 and shall be determined as under:~~

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{\text{(1–Aux Consum. Factor)}} \times \frac{P1}{1000}$$

(1) In case of non-fossil fuel based cogeneration projects, the following indexing mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of applicable variable charge component of tariff, in case developer wishes to opt for indexing mechanism:

$$P_{(n)} = P_{(n-1)} * \{a * (WPI_{(n)} / WPI_{(n-1)}) + b * (1+IRC_{(n-1)}) + c * (Pd_{(n)} / Pd_{(n-1)})\}$$

Where

- $P_{(n)}$ = *Price per ton of Bagasse for the nth year to be considered for tariff determination*
- $P_{(n-1)}$ = *Price per ton of Bagasse for the (n-1)th year to be considered for tariff determination. P1 shall be Biomass price for FY 2012 -13 as specified under Regulation 53.*
- *a* = *Factor representing fuel handling cost*
- *b* = *Factor representing fuel cost*
- *c* = *Factor representing transportation cost*
- $IRC_{(n-1)}$= *Average Annual Inflation Rate for indexed energy charge component in case of captive coal mine source (in %) to be applicable for (n- 1)th year, as may be specified by CERC for 'Payment purpose' as per Competitive Bidding Guidelines*
- Pd_n = *Weighted average price of HSD for nth year.*
- Pd_{n-1} = *Weighted average price of HSD for (n-1)th year.*
- WPI_n = *Whole sale price index for the month of April of nth year*
- WPI_{n-1} = *Wholesale price index for month of April of (n-1)th year.*

Where a, b & c will be specified by the Commission from time to time. In default, these factors shall be 0.2, 0.6 & 0.2 respectively.

(2) Variable Charge for the nth year shall be determined as under:

$$\textit{i.e. } VC_n = VC_1 \times (P_n / P_1) \text{ or } VC_n = VC_1 \times (1.05)^{(n-1)} \textit{ (optional)}$$

Where,

VC_1 represents the Variable Charge based on bagasse Price P_1 for FY 2012-13 as specified under Regulation 55 and shall be determined as under:

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Aux Consum. Factor})} \times \frac{P1}{1000}$$ [A]

55 Operation and Maintenance Expenses

[A][39]~~(1) Normative O&M expenses during first year of the Control period (i.e. FY 2010 - 11) shall be Rs. 15.0 Lakh per MW.~~

~~(2) Normative O&M expenses allowed at the commencement of the Control Period (i.e. FY 2010 - 11) under these Regulations shall be escalated at the rate of 5.72% per annum.~~

(1) Normative O&M expenses during first year of the Control period (i.e. FY 2012 - 13) shall be Rs. 16.0 Lakh per MW.

(2) Normative O&M expenses allowed at the commencement of the Control Period (i.e. FY 2012 - 13) under these Regulations shall be escalated at the rate of 5.72% per annum.[A]

[39] Omitted and inserted Regulation 55, vide First amendment (A), 2014

CHAPTER - 9
TECHNOLOGY SPECIFIC PARAMETERS FOR SOLAR PV POWER PROJECT

56 Technology Aspects

(1) Norms for Solar Photovoltaic (PV) power under these Regulations shall be applicable for 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.

57 Capital Cost

[A][40](~~(1) The normative capital cost for setting up Solar Photovoltaic Power Project shall be Rs. 1900 Lakh/MW for FY 2010-11. Provided that the Commission may deviate from above norm in case of project specific tariff determination in pursuance of Regulation 7 and Regulation 8.~~

The normative capital cost for setting up Solar Photovoltaic Power Project shall be Rs. 1000 Lakh/MW for FY 2012-13.

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

58 Capacity Utilisation Factor

(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.

59 Operation and Maintenance Expenses

(1) The O&M Expenses shall be Rs.11 Lakhs/MW for the 1st year of operation.

(2) Normative O&M expenses allowed at the commencement of the Control Period under these Regulations shall be escalated at the rate of 5.72% per annum.

[40] Omitted and inserted Regulation 57, vide First amendment (A), 2014

CHAPTER-10
TECHNOLOGY SPECIFIC PARAMETERS FOR SOLAR THERMAL POWER PROJECT

60 Technology Aspects

(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.

61 Capital Cost

[A][41] ~~(1) The normative capital cost for setting up Solar Thermal Power Project shall be Rs.1500 Lakh/MW for FY 2010 -11.~~

~~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.~~

The normative capital cost for setting up Solar Thermal Power Project shall be Rs.1300 Lakh/MW for FY 2012 -13.

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.][A]

62 Capacity Utilisation Factor

(1) The Capacity utilisation factor 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.

63 Operation and Maintenance Expenses

(1) The O&M Expenses shall be Rs 15 Lakhs/MW for 1st year operation.

(2) Normative O&M expenses allowed at the commencement of the Control Period under these Regulations shall be escalated at the rate of 5.72% per annum.

64 Auxiliary Consumption

(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.

[41] Omitted and inserted Regulation 61, vide First amendment (A), 2014

A[42CHAPTER – 11

TECHNOLOGY SPECIFIC PARAMETERS FOR BIOMASS GASIFIER POWER PROJECT

65. Technology Aspect

The norms for tariff determination specified hereunder are for biomass gasifier power projects based.

66. Capital Cost

The normative capital cost for the biomass gasifier power projects based on Rankine cycle shall be Rs 550/- Lakh/MW (FY 2012-13 during first year of Control Period) and shall be linked to indexation formula as outlined under Regulation 67. After taking into account of capital subsidy net project cost shall be Rs 400/-Lakh/MW for FY 2012-13.

67. Capital Cost Indexation Mechanism

(1) The following indexation mechanism shall be applicable in case of biomass gasifier power projects for adjustment in capital cost over the Control Period with the changes in Wholesale Price Index for Steel and Electrical Machinery,

$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$ $P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$

$d_{(n)} = [a*\{(SI_{(n-1)}/SI_{(0)}) - 1\} + b*\{(EI_{(n-1)}/EI_{(0)}) - 1\}]/(a+b)$

Where,

$CC\ (n)$ = *Capital Cost for* n^{th} *year*

$P\&M_{(n)}$ = *Plant and Machinery Cost for* n^{th} *year*

$P\&M_{(0)}$ = *Plant and Machinery Cost for the base year*

Note: $P\&M_{(0)}$ *is to be computed by dividing the base capital cost (for the first year of the control period) by* $(1+F_1+F_2+F_3)$

$d\ (n)$ = *Capital Cost escalation factor for year (n) of Control Period*

$SI_{(n-1)}$ = *Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period*

$SI_{(0)}$ = *Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

$EI_{(n-1)}$ = *Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period*

$EI_{(0)}$ = *Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

a = *Constant to be determined by Commission from time to time, (In default it is 0.7), for weightages to Steel Index*

b = *Constant to be determined by Commission from time to time, (In default it is 0.3), for weightages to Electrical Machinery Index*

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[42] Inserted chapter-11 and chapter-12 after chapter-10, vide First amendment (A), 2014

F_1 = *Factor for Land and Civil Works (0.10)*

F_2 = *Factor for Erection and Commissioning (0.09)*

F_3 = *Factor for IDC and Financing Cost (0.14)*

68. Plant Load Factor

Threshold Plant Load Factor for determining fixed charge component of Tariff shall be 85%.

69. Auxiliary Consumption

The auxiliary power consumption factor shall be 10% for the determination of tariff.

70. Specific fuel consumption

Normative specific fuel consumption shall be 1.25 kg per kWh.

71. Operation and Maintenance Expenses

(1) Normative O&M expenses for the first year of the Control period (i.e. FY 2012-13 shall be Rs 40/- Lakh per MW.

(2) Normative O&M expenses allowed at the commencement of the Control Period (i.e. FY 2012-13) under these Regulations shall be escalated at the rate of 5.72% per annum.

72. Fuel Mix

(1) The Biomass Gasifier based 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.

(2) The Biomass Gasifier based Power Generating Companies shall ensure fuel management plan to ensure adequate availability of fuel to meet the respective project requirements.

73. Fuel Cost

Biomass fuel price during first year of the Control Period (i.e. FY 2012-13) shall be as per Regulation 44 and shall be linked to indexation formula as specified under Regulation 74. Alternatively, for each subsequent year of the Tariff Period, the normative escalation factor of 5% per annum shall be applicable at the option of the Biomass Gasifier project developer.

74. Fuel Price Indexation Mechanism

(1) In case of Biomass Gasifier power projects, the following indexing mechanism for adjustment of fuelprices for each year of operation will be applicable for determination of applicable variable charge component of tariff, in case developer wishes to opt for indexing mechanism:

$$P_{(n)} = P_{(n-1)}*\{a*(WPI_{(n)}/WPI_{(n-1)}) + b*(1+IRC)_{(n-1)} + c*(Pd_{(n)}/Pd_{(n-1)})\}$$

Where,

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

$P_{(n-1)}$ = Price per tonne of biomass for the $(n-1)^{th}$ year to be considered for tariff determination. P_1 shall be Biomass price for FY 2012-13 as specified under Regulation 44.

a = Factor representing fuel handling cost b = Factor representing fuel cost

c = Factor representing transportation cost

$IRC_{(n-1)}$ = Average Annual Inflation Rate for indexed energy charge component in case of captive coal mine source (in %) to be applicable for $(n-1)^{th}$ year, as may be specified by CERC for 'Payment purpose' as per competitive Bidding Guidelines

Pd_n = Weighted average price of HSD for nth year.

Pd_{n-1} = Weighted average price of HSD for $(n-1)^{th}$ year.

WPI_n = Whole sale price index for the month of April of n^{th} year

WPI_{n-1} = Wholesale price index for month of April of $(n-1)^{th}$ year.

Where a, b & c will be specified by the Commission from time to time. In default, these factors shall be 0.2, 0.6 & 0.2 respectively.

(2) Variable Charge for the nth year shall be determined as under:

i.e. $VC_n = VC \times (P_n / P_1)$ or $VC_n = VC \times (1.05)^{(n-1)}_{1}$ (optional)

Where,

VC_1 represents the Variable Charge based on Biomass Price P_1 for FY 2012-13 as specified under Regulation 44 and shall be determined as under:

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Aux Cons. Factor})} \times \frac{P1}{1000}$$

(3) The biomass base price shall be revised at the end of the control period for the next Control Period and same shall also be applicable to project commissioned under this Control Period.

CHAPTER – 12

TECHNOLOGY SPECIFIC PARAMETERS FOR BIOGAS BASED POWER PROJECTS

75. Technology Aspect

The norms for tariff determination specified hereunder are for grid connected biogas based power projects that uses 100% Biogas fired engine, coupled with Biogas technology for co-digesting agriculture residues, manure and other bio waste as may be approved by MNRE.

76. Capital Cost

The normative capital cost for the biogas based power shall be Rs 1100/- Lakh/MW (FY 2012-13 during first year of Control Period) and shall be linked to indexation formula as outlined under Regulation 77. After taking into account of capital subsidy net project cost shall be Rs 800/- Lakh/MW for FY 2012-13.

77. Capital Cost Indexation Mechanism

(1) The following indexation mechanism shall be applicable in case of biogas based power projects for adjustment in capital cost over the Control Period ith the changes in Wholesale Price Index for Steel and Electrical Machinery,

$CC_{(n)} = P\&M_{(n)} * (1+F_1+F_2+F_3)$ $P\&M_{(n)} = P\&M_{(0)} * (1+d_{(n)})$

$d_{(n)} = [a*\{(SI_{(n-1)}/SI_{(0)}) - 1\} + b*\{(EI_{(n-1)}/EI_{(0)}) - 1\}]/(a+b)$

Where,

$CC_{(n)}$ = *Capital Cost for* n^{th} *year*

$P\&M_{(n)}$ = *Plant and Machinery Cost for* n^{th} *year*

$P\&M_{(0)}$ = *Plant and Machinery Cost for the base year*

Note: $P\&M_{(0)}$ *is to be computed by dividing the base capital cost (for the first year of the control period) by* $(1+F_1+F_2+F_3)$

$d_{(n)}$ = *Capital Cost escalation factor for year (n) of Control Period*

$SI_{(n-1)}$ = *Average WPI Steel Index prevalent for calendar year (n-1) of the Control Period*

$SI_{(0)}$ = *Average WPI Steel Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

$EI_{(n-1)}$ = *Average WPI Electrical Machinery Index prevalent for calendar year (n-1) of the Control Period*

$EI_{(0)}$ = *Average WPI Electrical and Machinery Index prevalent for calendar year (0) at the beginning of the Control Period i.e. April 2011 to March 2012*

a = *Constant to be determined by Commission from time to time, (In default it is 0.7), for weightages to Steel Index*

b = *Constant to be determined by Commission from time to time, (In default it is 0.3), for weightages to Electrical Machinery Index*

F_1 = *Factor for Land and Civil Works (0.10)*

F_2 = *Factor for Erection and Commissioning (0.09)*

F_3 = *Factor for IDC and Financing Cost (0.14)*

78. Plant Load Factor

Threshold Plant Load Factor for determining fixed charge component of Tariff shall be 90%.

79. Auxiliary Consumption

The auxiliary power consumption factor shall be 12% for the determination of tariff.

80. Operation and Maintenance Expenses

(1) Normative O&M expenses for the first year of the Control period (i.e. FY 2012-13 shall be Rs 40/- Lakh per MW.

(2) Normative O&M expenses allowed at the commencement of the Control Period (i.e. FY 2012-13) under these Regulations shall be escalated at the rate of 5.72% per annum.

81. Specific Fuel Consumption

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

82. Fuel Cost (Feed stock Price)

Feed stock price during first year of the Control Period (i.e. FY 2012-13) shall be Rs. 990/MT for FY 2012-13 (net of any cost recovery from digester effluent).

83. Fuel Price Indexation Mechanism

(1) In case of biomasspower projects, the following indexing mechanism for adjustment of fuel prices for each year of operation will be applicable for determination of applicable variable charge component of tariff, in case developer wishes to opt for indexing mechanism:

$$P_{(n)} = P_{(n-1)}*\{a*(WPI_{(n)}/WPI_{(n-1)})+b*(1+IRC)_{(n-1)}+c*(Pd_{(n)}/Pd_{(n-1)})\}$$

Where,

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

$P_{(n-1)}$ = *Price per tonne of biomass for the* $(n-1)^{th}$ *year to be considered for tariff determination.* P_1 *shall be Feed stock price for FY 2012-13 as specified under Regulation 82*

A = *Factor representing fuel handling cost*

B = *Factor representing fuel cost*

C = *Factor representing transportation cost*

$IRC_{(n-1)}$= *Average Annual Inflation Rate for indexed energy charge component in case of captive coal mine source (in %) to be applicable for* $(n-1)^{th}$ *year, as may be specified by CERC for 'Payment purpose' as per Competitive Bidding Guidelines*

Pd_n = *Weighted average price of HSD for nth year.*

Pd_{n-1} = *Weighted average price of HSD for* $(n-1)^{th}$ *year.*

WPI_n = *Whole sale price index for the month of April of* n^{th} *year*

WPI_{n-1} = *Wholesale price index for month of April of* $(n-1)^{th}$ *year.*

Where a, b & c will be specified by the Commission from time to time. In default, these factors shall be 0.2, 0.6 & 0.2 respectively.

(2) Variable Charge for the nth year shall be determined as under:

i.e. $VC_n = VC_1 \times (P_n / P_1)$ *or* $VC_n = VC_1 \times (1.05)^{(n-1)}$ *(optional)*

Where,

VC_1 *represents the Variable Charge based on Biomass Price* P_1 *for FY 2012-13 as specified under Regulation 44 and shall be determined as under:*

$$VC_1 = \frac{\text{Station Heat Rate (SHR)}}{\text{Gross Calorific Value (GCV)}} \times \frac{1}{(1 - \text{Aux Cons. Factor})} \times \frac{1}{1000}$$

(3) The biomass base price shall be revised at the end of third year of the control period and same shall also be applicable to project commissioned under this Control Period.][A]

CHAPTER-13
MISCELLANEOUS

84 Deviation from norms

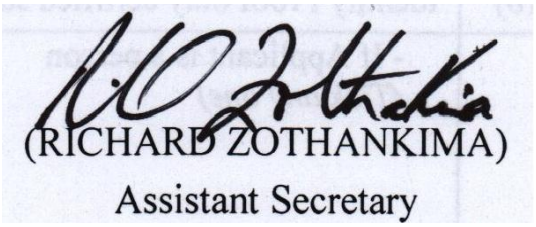
Tariff for sale of electricity by the generating company may also be determined in deviation from the norms specified in these regulations subject to the conditions that the levellised tariff over the useful life of the project on the basis of the norms in deviation does not exceed the levellised tariff calculated on the basis of the norms specified in these regulations.

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

85 Power to Relax

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.

By Order of the Commission,



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

Sl. No	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter values
	Power Generation	Capacity	Installed Power Generation Capacity Capacity Utilization Factor Commercial Operation Date Useful Life	MW % mm/yyyy Years	
2	Project Cost	Capital Cost/MW	Normative Capital Cost Capital Cost Capital subsidy, if any Net Capital Cost	Rs Lakh/MW Rs Lakh Rs Lakh Rs Lakh	
3	Financial Assumptions	Debt: Equity	Tariff Period Debt Equity Total Debt Amount Total Equity Amout	Years % % Rs Lacs Rs Lacs	
		Debt component	Loan Amount Moratorium Period years Repayment Period (incld. Moratorium) Intrest Rate	Rs Lacs years years %	
		Equity component	Equity amount Return on Equity for first 10 years Return on Equity 11th year onwards Discount Rate %	Rs Lacs % p.a % p.a % %	
		Depreciation	Depreciation Rate for first 12 years Depreciation Rate 13th year onwards	% Rs. L. p.a Years.	
		Incentives,	Generation Based Incentives, if any Period for GBI		
4	Operation & Maintenance		Normative O&M expense O&M expense per annum Escalation factor for O&M expense	Rs Lakh/MW Rs Lakh %	
5	Working Capital	O&M expense		Months	

		Maintenance Spare Receivables Interest on Working Capital	(% of O&M expenses)	% Months % p.a	

Form - 2.1: Form Template for (Biomass Power or Non-fossil fuel based Cogen) : Parameter Assumptions

Sl. No	**Assumption Head**	**Sub-Head**	**Sub-Head (2)**	**Unit**	**Parameter values**
1	**Power Generation**	Capacity	Installed Power Generation. Capacity Auxiliary Consumption factor PLF(during stabilization upto 6 months) PLF (during 1st yr. after stabilization) PLF (2nd yr. onwards) Commercial Operation Date Useful Life	MW % % % % mm/yyyy Years	
2	Project Cost	Capital Cost/MW	Normative Capital Cost Capital Cost Capital subsidy, if any Net Capital Cost	Rs Lakh/MW Rs Lakh Rs Lakh Rs Lakh	

3	Financial Assumptions		Tariff Period	Years	
	Debt:		Debt	%	
	Equity		Equity	%	
			Total Debt Amount	Rs Lacs	
			Total Equity Amount	Rs Lacs	
			Loan Amount	Rs Lacs	
	Debt		Moratorium Period	years	
	component		Repayment Period (incld.	years	
			Moratorium)	%	
			Interest Rate	Rs Lacs	
			Equity amount	% p.a	
	Equity		Return on Equity for first 10 years	% p.a	
	component		Return on Equity 11th year onwards	%	
			Discount Rate %	%	
			Depreciation Rate for first 12 years	%	
			Depreciation Rate 13th year	Rs. L. p.a	
	Depreciation		onwards	Years	
			Generation Based Incentives, if any		
	Incentives,		Period for GBI		
4	Operation & Maintenance				
		Normative O&M expense		Rs Lakh/MW	
		O&M expense per annum		Rs Lakh	
		Escalation factor for O&M expense		%	
5	Working Capital				
		O&M expense		Months	
		Maintenance Spare	(% of O&M expenses)	%	
		Receivables		Months	
		Biomass stock		Months	
		Interest on Working Capital		% p.a	

6	Fuel related assumptions Stations Heat Rate Fuel types & mix	During stabilization Post stabilization Biomass fuel type -1 Biomass fuel type – 2 Fossil fuel (coal) GCV of biomass fuel type – 1 GCV of biomass fuel type – 2 GCV of fossil fuel (coal) Biomass price(fuel type-1): yr.-1 Biomass price(fuel type-2):yr.-1 Fossil fuel price(coal), yr.-1 Fuel price escalation factor	Kcal/kWh Kcal/kWh % % % kCal/kg kCal/kg kCal/kg Rs/MT Rs/MT Rs/MT % p.a	

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

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

Tariff Components (Fixed charge)	**Unit**	**Yr-1**	**Yr-2**	**Yr-3**	**Yr-4**	**Yr-5**	**Yr-6**	**Yr-7**	**Yr-8**	**Yr-9**	**Yr-10**	**Yr-11**	**Yr-12**	**Yr-13**	**Yr-14**	**Yr-15**	**Yr-16**	**Yr-17**	**Yr-18**	**Yr-19**	**Yr-20**	**Yr-21**	**Yr-22**	**Yr-23**	**Yr-24**
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**	**Yr-1**	**Yr-2**	**Yr-3**	**Yr-4**	**Yr-5**	**Yr-6**	**Yr-7**	**Yr-8**	**Yr-9**	**Yr-10**	**Yr-11**	**Yr-12**	**Yr-13**	**Yr-14**	**Yr-15**	**Yr-16**	**Yr-17**	**Yr-18**	**Yr-19**	**Yr-20**	**Yr-21**	**Yr-22**	**Yr-23**	**Yr-24**
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**																								

Levellised Tariff	**Unit**	**Yr-1**	**Yr-2**	**Yr-3**	**Yr-4**	**Yr-5**	**Yr-6**	**Yr-7**	**Yr-8**	**Yr-9**	**Yr-10**	**Yr-11**	**Yr-12**	**Yr-13**	**Yr-14**	**Yr-15**	**Yr-16**	**Yr-17**	**Yr-18**	**Yr-19**	**Yr-20**	**Yr-21**	**Yr-22**	**Yr-23**	**Yr-24**

Discount Factors																									
Discounted Tariff components	Rs / kWh																								
Levellised Tariff	Rs / kWh																								

Form-2.2: Form Template for (Biomass Power or Non-fossil fuel based Cogen) : Determination of Tariff Components

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

Tariff Components (Fixed charge)	**Unit**	**Yr-1**	**Yr-2**	**Yr-3**	**Yr-4**	**Yr-5**	**Yr-6**	**Yr-7**	**Yr-8**	**Yr-9**	**Yr-10**	**Yr-11**	**Yr-12**	**Yr-13**	**Yr-14**	**Yr-15**	**Yr-16**	**Yr-17**	**Yr-18**	**Yr-19**	**Yr-20**	**Yr-21**	**Yr-22**	**Yr-23**	**Yr-24**	**Yr-25**
O&M Expenses	Rs Lakh																									
Depreciation	Rs Lakh																									
Interest on term loan	Rs Lakh																									
Interest on working Capital	Rs Lakh																									
Return on Equity	Rs Lakh																									
Total Fixed Cost	**Rs Lakh**																									

Tariff Components (Variable charge)	**Unit**	**Yr-1**	**Yr-2**	**Yr-3**	**Yr-4**	**Yr-5**	**Yr-6**	**Yr-7**	**Yr-8**	**Yr-9**	**Yr-10**	**Yr-11**	**Yr-12**	**Yr-13**	**Yr-14**	**Yr-15**	**Yr-16**	**Yr-17**	**Yr-18**	**Yr-19**	**Yr-20**	**Yr-21**	**Yr-22**	**Yr-23**	**Yr-24**	**Yr-25**

Biomass fuel type-1	Rs Lakh																								
Biomass fuel type-2	Rs Lakh																								
Fossil fuel (coal)	Rs Lakh																								
Sub-total (Fuel Costs	**Rs Lakh**																								
Fuel cost allocable to power	%																								
Total Fuel Costs	**Rs Lakh**																								

Per Unit Tariff components (fixed)	**Unit**	**Yr-1**	**Yr-2**	**Yr-3**	**Yr-4**	**Yr-5**	**Yr-6**	**Yr-7**	**Yr-8**	**Yr-9**	**Yr-10**	**Yr-11**	**Yr-12**	**Yr-13**	**Yr-14**	**Yr-15**	**Yr-16**	**Yr-17**	**Yr-18**	**Yr-19**	**Yr-20**	**Yr-21**	**Yr-22**	**Yr-23**	**Yr-24**	**Yr-25**
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																								

Levellised Tariff	**Unit**	**Yr-1**	**Yr-2**	**Yr-3**	**Yr-4**	**Yr-5**	**Yr-6**	**Yr-7**	**Yr-8**	**Yr-9**	**Yr-10**	**Yr-11**	**Yr-12**	**Yr-13**	**Yr-14**	**Yr-15**	**Yr-16**	**Yr-17**	**Yr-18**	**Yr-19**	**Yr-20**	**Yr-21**	**Yr-22**	**Yr-23**	**Yr-24**	**Yr-25**

Discount Factors	Rs/kWh																										
Discounted Tariff components (fixed)	Rs/kWh																										
Discounted Tariff components (variable)	Rs/kWh																										
Discounted Tariff components (total)	Rs/kWh																										
Levellised Tariff (fixed)	Rs/kWh																										
Levellised Tariff (variable)	**Rs/kWh**																										
Levellised Tariff (total)	**Rs/kWh**																										