

## CHHATTISGARH ELECTRICITY REGULATORY COMMISSION

### CSERC-(Terms and conditions for determination of generation tariff and related matters for electricity generated by plants based renewable energy sources) Regulations, 2012. dated 27<sup>h</sup> July 2012 with First Amendment Regulations 2013 dated 14<sup>th</sup> March, 2013

#### Summary of Order

Sl. No.	Description	Summary of Regulations
1	<b>Title</b>	CSERC Terms and conditions for determination of generation tariff and related matters for electricity generated by plants based renewable energy sources Regulations, 2012 with First Amendment Regulations 2013 dated 14 <sup>th</sup> March, 2013
2	<b>Date of enforcement</b>	To come into force from April 01, 2012 and shall remain in force for a period of 5 years from the date of commencement.
3	<b>Applicability</b>	Throughout the state of Chhattisgarh Applicable to renewable energy based generating stations established in the State
4	<b>Useful Life</b>	(i) Wind energy power project 25 years (ii) Small Hydro Plant 35 years (iii) Biomass power project 20 years (iv) Non-fossil fuel cogeneration 20 years (v) Solar PV/Solar thermal power plants 25 years
5	<b>Scope and extent of application</b>	<ul style="list-style-type: none"> <li>RE projects achieving COD after April 01, 2012 for generation and sale of electricity to distribution licensees under long term PPA for 20 years or more within the State and Tariff to be determined by the commission subject to the fulfillment of eligibility criteria</li> <li>In case of existing RE projects having long term PPA of 20 years or more, which have achieved COD before April 01, 2012, applicable tariff and other terms and conditions, shall be governed by respective RE Tariff Orders and amendments for the duration of the Tariff Period.</li> <li>On completion of validity of prevailing tariff orders, the new tariff to be based on these regulations on generic/project specific basis on the request of generators or licensees.</li> <li>For redetermination of the tariff after currency of the tariff order, the capital cost shall be allowed as specified in the then prevailing Orders.</li> </ul>
6	<b>Eligibility Criteria</b>	<ul style="list-style-type: none"> <li>New wind power project(s) using new plant and machinery</li> <li>New small hydro project(s) using new plant and machinery</li> <li>Biomass power project based on Rankine cycle technology using biomass fuel and using new plant and machinery</li> <li>Non-fossil fuel based co-generation project using new plant and machinery and meeting the qualifying requirements as per clause 55 of these Regulations</li> <li>Solar power projects based on Technologies approved by MNRE</li> </ul>
7	<b>Control Period</b>	<ul style="list-style-type: none"> <li>Five years commencing from financial year 2012-13.</li> <li>Benchmark capital cost for Solar PV projects to be reviewed annually by the Commission.</li> <li>Biomass price to be reviewed in line with the CERC Regulations.</li> <li>Tariff determined as per these Regulations for the RE projects commissioned during the Control Period shall continue to be applicable for the entire duration of the Tariff Period as specified in Regulation 8 below.</li> <li>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.</li> </ul>

8	<b>Tariff Period</b>	<ul style="list-style-type: none"> <li>• Tariff Period to be considered from the date of commercial operation of the generating station</li> <li>• Tariff Period of projects commencing COD after April 01, 2012 and for whom generic tariff is applicable shall be 12 years and without any revision during the control period.</li> <li>• For existing plants who have achieved COD before April 01, 2012 having long term PPA, Tariff period to be same as Control Period.</li> </ul>
9	<b>Project Specific tariff</b>	<p>(a) Project specific tariff, on case to case basis, shall be determined by the Commission for the following types of projects:</p> <ul style="list-style-type: none"> <li>• Municipal Solid Waste Projects</li> <li>• Any other new renewable energy technologies approved by MNRE</li> <li>• Hybrid Solar Thermal Power plants;</li> <li>• Any generating unit/ station, commissioned by using old plant and machinery</li> <li>• Biomass project other than that based on Rankine Cycle technology application with water cooled condenser;</li> <li>• Any project, if the licensee/developer desires for the project specific tariff</li> </ul> <p>For more details may refer the Regulations</p>
10	<b>Petition and proceedings for determination of tariff</b>	As detailed in these Regulations
11	<b>Tariff Structure</b>	<p>Single part Tariff consisting of the following fixed cost components:</p> <ul style="list-style-type: none"> <li>• Return on equity;</li> <li>• Interest on loan capital;</li> <li>• Depreciation;</li> <li>• Interest on working capital;</li> <li>• Operation and maintenance expenses;</li> </ul> <p>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</p>
12	<b>Tariff Design</b>	<ul style="list-style-type: none"> <li>• Generic tariff to be determined on levelled basis for the Tariff Period.</li> <li>• Provided that for RE technologies having two components tariff, tariff shall be determined on levelled basis considering the year of COD of the project for fixed cost component while the fuel cost component to be specified on year of operational basis.</li> <li>• For the purpose of levelled tariff computation, the discount factor equivalent to Post Tax weighted average cost of capital shall be considered.</li> <li>• Levellisation shall be carried out for the 'useful life' of the project while tariff shall be specified for the period equivalent to "Tariff Period".</li> <li>• Provided that for existing RE plants who have achieved COD before April 01, 2012 and having long term PPA with distribution licensee for useful life of the project, no levellisation of tariff to be carried out and tariff will be specified for five years.</li> </ul>
13	<b>Despatch principles for electricity generated from RE Sources:</b>	<ul style="list-style-type: none"> <li>• All RE 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</li> <li>• 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 monthly scheduling</li> </ul>
	<b>FINANCIAL PRINCIPLES</b>	For Details refer the REGULATIONS NOTIFICATION. However main Parameters for Fixation of Tariff are summarized below
14	<b>Capital Cost</b>	Detailed under <b>Technology Specific Parameters</b> for Different RE sources and shall be inclusive of all capital work including plant and machinery, civil work, erection and commissioning, financing costs preliminary and pre-operative expenses, interest during construction, and evacuation infrastructure up to inter-connection point.
14	<b>Debt equity ratio</b>	70:30

15	<b>Loan and Finance Charges</b>	<p>12 years</p> <ul style="list-style-type: none"> <li>• For computation of tariff, the normative interest rate shall be considered as average State Bank of India (SBI) Base rate prevalent on October 1<sup>st</sup> of the previous year of the tariff determination plus 300 basis points</li> <li>• Notwithstanding any moratorium period availed by the generating company, the repayment of loan shall be considered from the first year of COD and shall be equal to the annual depreciation allowed</li> <li>• For existing biomass plants having PPA with State DISCOM for preferential tariff opt for the project specific tariff, loan and finance charges will be considered as specified in the relevant orders.</li> </ul>
16	<b>Depreciation</b>	<ul style="list-style-type: none"> <li>• Value base shall be capital cost of the assets</li> <li>• Depreciation to be calculated annually on straight-line method</li> <li>• Salvage value to be 10% and depreciation up to maximum 90% of the capital cost of the asset.</li> <li>• Depreciation rate for the first 12 years of the Tariff Period to be 5.83% per annum and the remaining depreciation shall be spread over the remaining useful life of the project from 13th year onwards.</li> <li>• Depreciation shall be chargeable from the first year of commercial operation. In case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis.</li> </ul>
17	<b>Return on equity</b>	<ul style="list-style-type: none"> <li>• Value base for the equity shall be 30% of the capital cost or actual equity in case of project specific tariff determination</li> <li>• Normative Return on Equity: 20% per annum for the first 10 years and 24% per annum 11<sup>th</sup> years onwards</li> </ul> <p>For existing biomass plants having PPA with State DISCOM for preferential tariff opt for the project specific tariff, return on equity will be considered as specified in the relevant orders.</p>
18	<b>Interest on working capital</b>	<p>To be computed as under:</p> <ol style="list-style-type: none"> <li>1. <b>Small Hydro Power /Solar PV/Wind</b> <ul style="list-style-type: none"> <li>• O &amp; M expenses for one month</li> <li>• Receivables equivalent to 2 months of energy charges for sale of electricity calculated on the normative CUF;</li> <li>• Maintenance spare @ 15% of O &amp; M expenses</li> </ul> </li> <li>2. Biomass Power <ul style="list-style-type: none"> <li>• Fuel costs for four months equivalent to normative PLF;</li> <li>• O &amp; M expenses for one month</li> <li>• Receivables equivalent to 2 months of fixed and variable charges for sale of electricity calculated on the target PLF;</li> <li>• Maintenance spare @ 15% of O &amp; M expenses</li> </ul> </li> </ol> <p>1. Interest on Working Capital shall be at interest rate equivalent to the average State Bank of India Base Rate prevalent on October 1<sup>st</sup> of the previous year plus 350 basis points.</p>
19	<b>O &amp; M expenses</b>	<ul style="list-style-type: none"> <li>• O&amp;M expenses shall comprise repair and maintenance (R&amp;M), establishment including employee expenses, and administrative and general expenses</li> <li>• Shall be determined for the Tariff Period based on normative O&amp;M expenses for the first Year of Control Period.</li> <li>• Normative O&amp;M expenses allowed during first year of the Control Period (i.e. FY 2012-13) at the rate of 5.72% per annum over the Tariff Period.</li> </ul>
20	<b>Rebate</b>	<ul style="list-style-type: none"> <li>• For payment of bills through LC: 2%</li> <li>• Payments made other than through LC within a period of one month of presentation of bills: 1%</li> </ul>
21	<b>Late Payment Surcharge</b>	<p>In case the payment of any bill for charges 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.</p>

22	<b>Subsidy or incentive by the Central / State Government</b>	<ul style="list-style-type: none"> <li>Commission to consider any incentive/grant/ subsidy offered by the Central/ State Government and income tax benefit on account of accelerated depreciation, if availed by the generating company while determining the project specific tariff.</li> <li>In case any Central Government / State Government specifically provides for any Generation based Incentive over and above tariff, the same shall not be factored in while determining Tariff.</li> </ul>												
23	<b>Taxes and Duties</b>	<ul style="list-style-type: none"> <li>Tariff determined shall be exclusive of taxes and duties as may be levied by the appropriate Government provided the Government allows the same as pass through on actual incurred basis.</li> <li>In case of SHP, water charges as levied by the State Government shall not be included in the tariff. It is to be paid separately and shall be pass through on actual incurred basis.</li> </ul>												
<b>Technology Specific Parameters</b>														
<b>Wind Energy Projects</b>														
24	<b>Capital Cost</b>	<p><b>Rs. 575 Lakh/MW</b> (FY 2012-13 during first year of Control Period) and shall be revised for the projects to be commissioned in each subsequent year as per Capital Cost Indexation Mechanism stipulated under CERC RE Tariff Regulations..</p> <p>Note: Capital Cost to include WTG, its auxiliaries, land cost, site development charges and other civil works, transportation charges, evacuation cost up to inter-connection point, financing charges and IDC.</p>												
25	<b>Capacity Utilisation Factor (CUF)</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%; text-align: center;">Annual Mean Wind Power Density (W/M2) at 80m hub height meter hub-height</th> <th style="width: 40%; text-align: center;">CUF</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Upto 200</td> <td style="text-align: center;">20%</td> </tr> <tr> <td style="text-align: center;">201-250</td> <td style="text-align: center;">22%</td> </tr> <tr> <td style="text-align: center;">251-300</td> <td style="text-align: center;">25%</td> </tr> <tr> <td style="text-align: center;">301-400</td> <td style="text-align: center;">30%</td> </tr> <tr> <td style="text-align: center;">&gt;400</td> <td style="text-align: center;">32%</td> </tr> </tbody> </table>	Annual Mean Wind Power Density (W/M2) at 80m hub height meter hub-height	CUF	Upto 200	20%	201-250	22%	251-300	25%	301-400	30%	>400	32%
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26	<b>O &amp; M expenses</b>	Rs. 9 Lakh per MW(for the first year of Control Period) to be escalated at the rate of 5.72% per annum over the tariff period												
<b>Small Hydro Project</b>														
27	<b>Capital Cost</b>	<p>The normative capital cost during first year of Control Period (FY 2012-13) shall be as follows:</p> <table border="1" style="width: 60%; margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%; text-align: center;">Project Size</th> <th style="width: 60%; text-align: center;">Capital Cost (Rs. Lakh/MW)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">below 5 MW</td> <td style="text-align: center;">600</td> </tr> <tr> <td style="text-align: center;">5 MW to 25 MW</td> <td style="text-align: center;">550</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>The above cost also includes the cost of laying of transmission lines for evacuation of power</li> <li>For project specific tariff if transmission line exceeds 10 kms additional cost of laying the transmission lines may be allowed subject to check by the Commission</li> <li>For project specific tariff considering the topography and the geological surprises/ constraints the project cost that can be allowed up to a maximum of Rs. 25 lakh/MW</li> <li>Capital cost for project who achieved COD before April 01, 2012 will be governed through respective approved Orders of the Commission.</li> <li>The capital cost for subsequent years shall be determined on the basis of indexation formula as outlined under Regulation 25 of the Regulations.</li> <li>Provided that for existing SHP plants who have achieved COD before April 01, 2012 and having long term PPA with distribution licensee for useful life of the project, for which commission have determined tariff, capital cost will be as specified in relevant orders of the commission and capital grant/subsidy to be adjusted in the capital cost.</li> </ul>	Project Size	Capital Cost (Rs. Lakh/MW)	below 5 MW	600	5 MW to 25 MW	550						
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below 5 MW	600													
5 MW to 25 MW	550													
28	<b>Capacity Utilisation Factor</b>	30%												

29	<b>Normative Auxiliary Consumption</b>	1.5%
30	<b>O &amp; M expenses</b>	Normative O&M expenses for the first year of the Control period (i.e. FY 2012-13 shall be as follows. <ul style="list-style-type: none"> <li>For projects below 5 MW - Rs. 20 Lakh/MW</li> <li>For projects 5 MW to 25 MW - Rs. 14 Lakh/MW</li> </ul> Normative O&M expenses shall be escalated @ of 5.72% per annum for the Tariff Period for the purpose of determination of levellised tariff.
31	<b>Tariff for Mini/Micro Hydro Projects</b>	To be higher by Rs 0.50/kWh over SHP or as stipulated by Commission but will not be applicable for the developers/licensee who opts for project specific tariff and on canal based projects.
<b>Biomass Power Projects based on Rankine Cycle Technology using Water Cooled Condenser</b>		
32	<b>Capital Cost</b>	Rs.445 Lakh/MW (FY 2012-13) during first year of Control Period and shall be linked to indexation formula as outlined in the Regulations
33	<b>Plant Load Factor</b>	80%
34	<b>Auxiliary Consumption</b>	10%
35	<b>Station Heat Rate</b>	4000 kCal/ kWh
36	<b>O &amp; M expenses</b>	<ul style="list-style-type: none"> <li>Normative O&amp;M expenses for the first year of the Control period (i.e. FY 2012-13 ) shall be Rs. 24 Lakh/MW.</li> <li>Normative O&amp;M expenses shall be escalated @ of 5.72% per annum for the control Period</li> </ul>
37	<b>Fuel Mix</b>	<ul style="list-style-type: none"> <li>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 the project such as crop residues, agro-industrial residues, forest residues etc. and other biomass fuels as may be approved by MNRE.</li> <li>Generating Companies shall ensure fuel management plan to ensure adequate availability of fuel to meet the respective project requirements.</li> </ul>
38	<b>Use of Fossil Fuel</b>	Use of fossil fuels shall be on Kcal basis of total fuel consumption as per MNRE guidelines which is presently 15%
39	<b>Monitoring Mechanism for the use of fossil fuel</b>	As detailed in the Regulations
40	<b>Calorific Value</b>	3300 Kcal/kg
41	<b>Fuel Cost</b>	Biomass fuel price during first year of the Control Period (i.e. FY 2012-13) shall be Rs. 2476 per MT and shall be linked to index formulae as specified in the Regulation.
<b>Technology specific parameters for Non-fossil fuel based Cogeneration Projects</b>		
42	<b>Capital Cost</b>	<ul style="list-style-type: none"> <li>Rs.420Lakh/MW (FY 2012-13) during first year of Control Period and shall be linked to indexation formula as outlined in the Regulations</li> <li>Tariff for projects, achieved COD before April 01, 2012 will be governed through respective approved Orders of the Commission till the currency of the Orders</li> </ul>
43	<b>Capacity Utilisation Factor</b>	For determining fixed charges plant load factor to be computed on the basis of plant availability for number of operating days (Refer Regulations)
44	<b>Auxiliary Consumption</b>	10%
45	<b>Station Heat Rate</b>	3600 kCal/ kWh
46	<b>Calorific Value</b>	2250 Kcal/kg(bagasse)
47	<b>Fuel Cost</b>	Biomass fuel price during first year of the Control Period (i.e. FY 2012-13) shall be Rs. 1583 per MT and shall be linked to index formulae as specified in the Regulation.

48	<b>Fuel Mix</b>	<ul style="list-style-type: none"> <li>The power plant shall be designed in such a way that it uses different types of non-fossil fuels available within the vicinity of the project such as crop residues, agro-industrial residues, forest residues etc. and other biomass fuels as may be approved by MNRE.</li> <li>Generating Companies shall ensure fuel management plan to ensure adequate availability of fuel to meet the respective project requirements.\</li> </ul>
49	<b>Use of Fossil Fuel</b>	Use of fossil fuels shall be on Kcal basis of total fuel consumption as per MNRE guidelines which is presently 15%
50	<b>O &amp; M expenses</b>	<ul style="list-style-type: none"> <li>Normative O&amp;M expenses for the first year of the control period (i.e. FY 2012-13 ) shall be Rs. 16 Lakh/MW.</li> <li>Normative O&amp;M expenses shall be escalated @ of 5.72% per annum for the control Period</li> </ul>
<b>Solar PV Power Projects</b>		
51	<b>Technology Aspects</b>	Applicable for grid connected PV systems more than 1MW 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
52	<b>Capital Cost</b>	Rs. 1000 Lakh/MW for FY 2012-13 to be reviewed every year Capital cost of projects who achieved COD before April01, 2012 will be governed through respective approved Orders of the Commission till the currency of the Orders
53	<b>Capacity Utilisation Factor</b>	19%.
54	<b>O&amp;M Expenses</b>	<ul style="list-style-type: none"> <li>Rs. 11 Lakhs/MW for the first year of operation</li> <li>Normative O&amp;M expenses allowed at the commencement of the Control Period shall be escalated at the rate of 5.72% per annum.</li> </ul>
<b>Solar Thermal Power Projects</b>		
55	<b>Technology Aspects</b>	To be applicable for Concentrated solar power (CSP) technologies approved by MNRE
56	<b>Capital Cost</b>	Rs. 1300 Lakh/MW for FY 2012-13 to be reviewed every year
57	<b>Capacity Utilisation Factor</b>	23%.
58	<b>O&amp;M Expenses</b>	<ul style="list-style-type: none"> <li>Rs. 15 Lakhs/MW for the first year of operation</li> <li>Normative O&amp;M expenses allowed at the commencement of the Control Period shall be escalated at the rate of 5.72% per annum.</li> </ul>
59	<b>Auxiliary Consumption</b>	10%
60	<b>Hybrid Solar Thermal Power Plants</b>	Parameters to be decided by the commission on case to case basis
<b>Miscellaneous</b>		
61	<b>Deviation from Norms</b>	Tariff for sale of electricity by the generating company may also be determined in deviation from the norms specified in these Regulations subject to the conditions that the reasons for deviation from the norms specified under these Regulations shall be recorded in writing.
62	<b>Power to Relax</b>	Vested with the Commission
63	<b>Power to remove difficulties</b>	Vested with the Commission
64	<b>Repeal</b>	CSERC (Terms and conditions for determination of generation tariff and related matters for electricity generated by plants based on non-conventional sources of energy) Regulations, 2008 shall stand repealed.