

## ASSAM ELECTRICITY REGULATORY COMMISSION

### (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012

**Dated 10th September, 2012**

Sl. No.	Description	Summary
1	<b>Title</b>	Assam Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2012 Dated 10th September, 2012
2	<b>Date of enforcement</b>	Regulations to come into force from the date of their publication in the Assam Gazette.
3	<b>Applicability</b>	<ul style="list-style-type: none"> <li>• Throughout the state of Assam</li> </ul>
4	<b>Applicability</b>	<ul style="list-style-type: none"> <li>• Regulations shall be applicable to the obligated entities.</li> </ul>
5	<b>Eligibility Criteria</b>	<ul style="list-style-type: none"> <li>• Wind power project - Using new wind power generators</li> <li>• SHP - At sites approved by State Nodal agency/State Government and using new plant and machinery</li> <li>• Biomass power project -Using new plant and machinery based on Rankine cycle technology and using biomass fuel sources and having a grid connected system</li> <li>• Non-fossil fuel based co-generation project - Using new plant and machinery</li> <li>• Solar PV and Solar Thermal Power Projects - Based on Technologies approved by MNRE</li> <li>• Biomass Gasifier based Power Project /Biogas based Power Project - Using new plant and machinery and having a grid connected system</li> </ul>
6	<b>Useful Life</b>	<ul style="list-style-type: none"> <li>• Wind projects -25 years</li> <li>• Biomass &amp; cogeneration projects -20 years</li> <li>• Small Hydro Plant - 35 years</li> <li>• Solar PV/Solar thermal power plants -25 years</li> <li>• Biomass Gasifier based project -20 years</li> <li>• Biogas project -20 years</li> </ul>
7	<b>Control Period</b>	<ul style="list-style-type: none"> <li>• Five years with first year shall be from the date of notification of these regulations to 31.3.2013.</li> <li>• Tariff for projects commissioned during the Control Period, shall continue to be applicable for the entire duration of the Tariff Period as specified in the Regulations</li> </ul>
8	<b>Tariff Period</b>	<ul style="list-style-type: none"> <li>• RE projects except SHP below 5 MW, Solar PV, Solar thermal, Biomass gasifier and Biogas -13 years</li> <li>• SHP below 5 MW -35 years</li> <li>• Solar PV and Solar thermal projects - 25 years</li> <li>• Biomass gasifier and biogas projects - 20 years</li> </ul> <p>Note: Tariff period shall be considered from COD of Generating Stations</p>
9	<b>Project Specific Tariff</b>	<ul style="list-style-type: none"> <li>• Municipal Solid Waste Projects</li> <li>• Solar PV and Solar Thermal Power projects, if a project developer opts for project specific tariff</li> <li>• Hybrid Solar Thermal Power plants</li> <li>• Other hybrid projects based on renewable technology approved by MNRE</li> <li>• Biomass project other than that based on Rankine Cycle technology application with water cooled condenser</li> <li>• Any other new renewable energy technologies approved by MNRE</li> </ul>
10	<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>

		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. The fuel cost component may be subjected to escalation factor.
11	<b>Tariff Design</b>	As detailed in these Regulations
12	<b>Petition and proceedings for determination of tariff</b>	Detailed in the Order
13	<b>Despatch principles</b>	<ul style="list-style-type: none"> <li>• All RE plants except biomass of 10 MW and above and non-fossil fuel based cogeneration plants to be treated as 'MUST RUN' power plants and not subjected to 'merit order' dispatch principles</li> <li>• Biomass plants of 10 MW and above and non-fossil fuel based co-generation projects shall be subjected to scheduling and despatch code as specified under AERC Grid Code and other relevant regulations .</li> <li>• Solar plants of 5 MW and above and connected at 33 KV level and above to be subjected to scheduling and despatch code specified under AERC Grid Code</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
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 during the first six months of the previous year 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> </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: Pre-tax 20% per annum for the first 10 years and Pre-tax 24% per annum 11<sup>th</sup> years onwards</li> </ul>
18	<b>Interest on working capital</b>	<p>To be computed as under:</p> <ol style="list-style-type: none"> <li><b>1. Wind Energy / Small Hydro Power / Solar PV / Solar thermal</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><b>2 Biomass, Biogas Power and Non-fossil fuel Co-generation</b> <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> <li><b>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.</b></li> </ol>

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>	In case of delayed payment of any bill 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.						
22	<b>Sharing of CDM Benefits</b>	<p>Proceeds of carbon credit from approved CDM project to be shared between generating company and concerned beneficiaries as follows:</p> <ul style="list-style-type: none"> <li>100% by project developer in the first year after the date of commercial operation of the generating station.</li> <li>2<sup>nd</sup> year – share of beneficiaries @ 10% to progressively increase by 10% every year up to 50% where after to be shared in equal proportion, by the generating company and the beneficiaries</li> </ul>						
23	<b>Subsidy or incentive by the Central / State Government</b>	Commission to consider any incentive/or 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 tariff.						
24	<b>Taxes and Duties</b>	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.						
<b>Technology Specific Parameters</b>								
<b>Wind Energy</b>								
25	<b>Capital Cost</b>	<ul style="list-style-type: none"> <li>Rs.575 Lakh/MW during first year of Control Period (FY 2012-13)</li> <li>Linked to indexation formula as per Regulation 26(Order)</li> </ul>						
26	<b>Capacity Utilisation Factor</b>	Based on Annual Mean Wind Power Density (W/m <sup>2</sup> ) detailed in the Order						
27	<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.9.00 Lakh per MW</li> <li>Normative O&amp;M expenses shall be escalated @ of 5.72% per annum for the Tariff Period for the purpose of determination of levellised tariff</li> </ul>						
<b>Small Hydro Project</b>								
28	<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="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Project Size</th> <th>Capital Cost (Rs. Lakh / MW)</th> </tr> </thead> <tbody> <tr> <td>Below 5 MW</td> <td>770</td> </tr> <tr> <td>5 MW to 25 MW</td> <td>700</td> </tr> </tbody> </table> <p>The capital cost for subsequent years shall be determined on the basis of indexation formula as outlined under Regulation 30 of the Regulations</p>	Project Size	Capital Cost (Rs. Lakh / MW)	Below 5 MW	770	5 MW to 25 MW	700
Project Size	Capital Cost (Rs. Lakh / MW)							
Below 5 MW	770							
5 MW to 25 MW	700							
29	<b>Capacity Utilisation Factor</b>	45% CUF shall be net of free power to the home State						
30	<b>Normative Auxiliary Consumption</b>	1%						
31	<b>O &amp; M expenses</b>	<p>Normative O&amp;M expenses for the first year of the Control period (i.e. FY 2012-13 shall be as follows.</p> <ul style="list-style-type: none"> <li>For projects below 5 MW - Rs. 25 Lakh/MW</li> <li>For projects 5 MW to 25 MW - Rs. 18 Lakh/MW</li> </ul> <p>Normative O&amp;M expenses shall be escalated @ 5.72% per annum for the Tariff Period for the purpose of determination of levellised tariff.</p>						

<b>Biomass based Power Projects Based on Rankine Cycle technology</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>	<ul style="list-style-type: none"> <li>• During Stabilisation: 60%</li> <li>• During the remaining period of the first year (after stabilization): 70%</li> <li>• From 2nd Year onwards: 80 %</li> </ul> Stabilisation period shall not be more than 6 months from the date of commissioning of the project.
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 Tariff Period for the purpose of determination of levellised tariff.</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>	To be limited to the extent of 15% of total fuel consumption on annual basis.
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>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> </ul>
<b>Non-fossil fuel based Cogeneration Projects</b>		
42	<b>Normative Capital Cost based on Rankine cycle</b>	Rs.420 Lakh/MW (FY 2012-13 during first year of Control Period) and shall be linked to indexation formula as outlined under Regulation .
43	<b>Plant Load Factor</b>	53%.
44	<b>Auxiliary Consumption</b>	8.5%
45	<b>Station Heat Rate</b>	3600 kCal / kWh
46	<b>Calorific value</b>	2250KCal/kg
47	<b>Fuel Cost</b>	<ul style="list-style-type: none"> <li>• Bagasse fuel price shall be Rs. 1583 per MT and shall be linked to index formulae as specified in the Regulation.</li> <li>• 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</li> </ul>
48	<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 Tariff Period for the purpose of determination of levellised tariff.</li> </ul>
<b>Solar PV Power Projects</b>		
49	<b>Technology and Applicability</b>	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

50	Capital Cost	Rs. 1000 Lakh/MW for FY 2012-13 Commission may deviate from above norm in case of project specific tariff determination
51	Capacity Utilisation Factor	19%. Commission may deviate from above norm in case of project specific tariff determination
52	O&M Expenses	<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>		
53	Technology and Applicability	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,
54	Capital Cost	Rs. 1300 Lakh/MW for FY 2012-13 Commission may deviate from above norm in case of project specific tariff determination
55	Capacity Utilisation Factor	23% %. Commission may deviate from above norm in case of project specific tariff determination
56	O&M Expenses	<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>
57	Auxiliary Consumption	10% Commission may deviate from above norm in case of project specific tariff determination
<b>Biomass Gasifier Power Projects</b>		
58	Normative Capital Cost based on Rankine cycle	Rs.550 Lakh/MW (FY 2012-13 during first year of Control Period) and shall be linked to indexation formula as outlined under Regulation . After taking into account capital subsidy net project cost shall be ` Rs.400Lakh/MW for FY 2012-13.
59	Plant Load Factor	85%.
60	Auxiliary Consumption	10%
61	Specific fuel consumption	1.25 kg per kWh.
62	Normative O & M expenses	Rs.40 Lakh/MW (FY 2012-13) for first year of Control Period O&M expenses to be escalated @ of 5.72% PA
63	Fuel Mix	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, agroindustrial & forest residues etc. and other biomass fuels as may be approved by MNRE
64	Fuel Cost	Same as detailed at Regulation 41 above for Biomass Power Projects
<b>Biogas based Power Projects</b>		
65	Technology and Applicability	Applicable for grid connected biogas based power projects that uses 100% Biogas tired engine, coupled with Biogas technology for co-digesting agriculture residues, manure and other bio waste as may be approved by MNRE.
66	Capital Cost	Rs.1100 Lakh/MW (FY 2012-13 during first year of Control Period) and shall be linked to indexation formula as outlined under Regulation. After taking into account capital subsidy net project cost shall be Rs.800 Lakh/MW for FY 2012-13.
67	Plant Load Factor	90%.
68	Auxiliary Consumption	12%

69	<b>Normative O &amp; M expenses</b>	Rs.40 Lakh/MW (FY 2012-13) for first year of Control Period O&M expenses to be escalated @ of 5.72% PA
70	<b>Specific Fuel Consumption</b>	3 kg of substrate mix per kWh
71	<b>Fuel Cost</b>	Same as detailed at Regulation41above for Biomass Power Projects
<b>Miscellaneous</b>		
72	<b>Deviation from Norms</b>	Tariff for sale of electricity generated from a RE generating station may also be agreed between a generating company and a licensee, in deviation from the norms specified in these regulations subject to the conditions that the levelled tariff over the useful life of the project on the basis of the norms in deviation does not exceed the levelled tariff calculated on the basis of the norms specified in these regulations.
73	<b>Power to Relax</b>	Vested with the Commission
74	<b>Power to Amend</b>	Vested with the Commission
75	<b>Power to remove difficulties</b>	Vested with the Commission
76	<b>Repeals</b>	With the coming into force of these Regulations, the following provisions of the Assam Electricity Regulatory Commission (Co-generation and Generation of Electricity from Renewable Sources of Energy) <b>Regulations, 2009 shall stand repealed :</b> <b>(a) Regulation 6: Determination of Tariff for electricity from Renewable sources and Cogeneration</b> <b>(b) Regulation 7: Price Capping for Energy from Cogeneration and various Renewable Sources like (1) Biomass, (2) Small Hydro, (3) Co-generation (4) Municipal Solid Waste (MSW), and (5)(a) Solar PV</b>