

RAJASTHAN ELECTRICITY REGULATORY COMMISSION

**(Generic tariff for sale of electricity from Biomass and Biogas based Power Plants getting Commissioned during 2014-15 and revised energy charges of the Bio-mass power plants commissioned during the period 2009-2014)
Order dated 23-07-2014**

**and “Rajasthan Electricity Regulatory Commission (Terms and Conditions for determination of tariff) Seventh amendments Regulations 2014
Order dated 24 February 2014**

Sl. No.	Description	Summary
1.	MAT/Tax Rate	For the purpose of grossing up the base rate of ROE Commission has considered MAT rate of 20.01% (18.50% MAT rate + 5% surcharge + 3% cess) for first year and a MAT rate of 19.06 (MAT rate 18.5% + 3% Cess) for remaining 9 years out of first 10 years. For remaining 15 years of plant life, the normal tax rate of 30.90% (30% tax rate + 3% cess). Similarly for determination of levelised benefits of higher depreciation, Commission has considered tax rate of 32.45% (30% tax rate + 5% surcharge + 3% Cess) for the 1 st year and 30.90% (30% tax rate + 3% cess) for subsequent years.
2.	Difference in Variable Charges	Variable cost for new plants to be commissioned in 2014-15 has been notified as Rs. 3.76 per unit and for old plants set up under regulation 2009-14 as Rs. 3.71 per unit.
3.	Discount Rate	13.10% for Biomass and Biogas plants getting commissioned during 2014-15
4.	Accelerated Depreciation benefit for Biogas power plants	Has been considered on net capital of Rs. 853 lakh/MW instead of gross capital.
5.	Biomass storage and handling Cost	2%
6.	Calculation Sheets	In the tariff computation sheets Commission has considered income tax rate of 30.90% for 11 th year onwards and for computation of levelised benefits of accelerated depreciation, a rate of 32.45% for the first year and 30.90% for the 11 th year onwards.
7.	Depreciation rate for accelerated depreciation benefits	5.28% of total project cost for first 12 years and the remaining depreciation spread over the remaining useful life of the project from 13 th year onwards.
8.	Tariff Levelisation	The levelised tariff for Biomass and Biogas based Power Plants getting commissioned during 2014-15 has been worked out as per operational & performance parameters laid down by the Commission.
	(i) Useful life	20 years
	(ii) Capital Cost	<ul style="list-style-type: none"> • Rs. 526 lakh/MW and Rs. 561 lakh/MW for bio-mass based Power Plants employing Water Cooled and air Cooled Condensers. • The cost includes Rs. 15 lakh /MW towards transmission system and Rs. 2 lakh/MW as connectivity charges payable to STU. • Rs. 853 lakh/MW excluding subsidy but includes transmission charges upto inter-connection point and connectivity charges of Rs. 2 lakh/MW for Biogas based power plants
	(iii) Debt Equity Ratio	70:30

	(iv) Return on Equity	The return on equity has been computed by grossing up the base rate of 16% with tax rate equivalent to Minimum Alternate Tax for first 10 years from COD and normal tax rate for remaining years of project life.																		
	(v) Operation & Maintenance (O&M) expenses	<p>The normative O&M expenses considered for computation of generic levelised fixed component of tariff for 2014-15 for Biomass and Biogas based power plants is as under:</p> <table border="1" data-bbox="542 384 1291 680"> <thead> <tr> <th>Sl. No.</th> <th>Renewable Energy Project</th> <th>O&M Expenses for FY 2014-15</th> </tr> </thead> <tbody> <tr> <td rowspan="4">1.</td> <td>Biomass Power Plants</td> <td></td> </tr> <tr> <td>(1) With Water Cooled Condenser</td> <td>Rs. 33.22 Lakh/MW</td> </tr> <tr> <td>Transmission System</td> <td>Rs. 0.45 Lakh/MW</td> </tr> <tr> <td>(2) With Air Cooled Condenser</td> <td>Rs. 35.49 Lakh/MW</td> </tr> <tr> <td></td> <td>Transmission System</td> <td>Rs. 0.45 Lakh/MW</td> </tr> <tr> <td rowspan="2">2.</td> <td>Biogas Power Plants</td> <td>Rs. 44.71 Lakh/MW</td> </tr> </tbody> </table>	Sl. No.	Renewable Energy Project	O&M Expenses for FY 2014-15	1.	Biomass Power Plants		(1) With Water Cooled Condenser	Rs. 33.22 Lakh/MW	Transmission System	Rs. 0.45 Lakh/MW	(2) With Air Cooled Condenser	Rs. 35.49 Lakh/MW		Transmission System	Rs. 0.45 Lakh/MW	2.	Biogas Power Plants	Rs. 44.71 Lakh/MW
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		(vi) Interest rate on long term loan and interest on working capital requirement	<ul style="list-style-type: none"> Interest on long term loan for Biomass and Biogas Plants is SBI base rate plus 300 basis Points. Interest on Working Capital for Biomass and Biogas Power Plants is to be taken as average SBI base rate prevalent during first six months of previous year Plus 250 basis points i.e. 12.21%. 																	
	(vii) Depreciation	5.28% of capital cost for first 12 years and remaining depreciation value has been spread over the balance useful life of the Power Project and transmission line, as the case may be.																		
	(viii) Plant Load Factor	PLF for Biomass based Power Plants as 60% during stabilization, 70% during first year and 75% from second year onwards. 85% for biogas based plants.																		
	(ix) Auxiliary Consumption Factor	<p>Auxiliary Consumption factor for Biomass based power plants for the year 2014-15 is as under:</p> <table border="1" data-bbox="542 1087 1421 1234"> <thead> <tr> <th>Particular</th> <th>Water Cooled condenser</th> <th>Air Cooled condenser</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Air Consumption Factor</td> <td>10.50% (during Stabilisation)</td> <td>12.50% (during stabilization)</td> </tr> <tr> <td>10% (after stabilization)</td> <td>12% (after stabilisation)</td> </tr> </tbody> </table> <p>For Biogas Power Plants an auxiliary consumption factor is 12%.</p>	Particular	Water Cooled condenser	Air Cooled condenser	Air Consumption Factor	10.50% (during Stabilisation)	12.50% (during stabilization)	10% (after stabilization)	12% (after stabilisation)										
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	(x) Station Heat Rate	<p>For Biomass based power plants, Station Heat Rate for 2014-15 is as under:</p> <table border="1" data-bbox="542 1339 1421 1514"> <thead> <tr> <th>Particular</th> <th>Water Cooled condenser</th> <th>Air Cooled condenser</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Station Heat Rate</td> <td>4300 kCal/kWh (during Stabilization)</td> <td>4540 kCal/kWh (during stabilization)</td> </tr> <tr> <td>4200 kCal/kWh (after stabilization)</td> <td>4440 kCal/kWh (after stabilization)</td> </tr> </tbody> </table>	Particular	Water Cooled condenser	Air Cooled condenser	Station Heat Rate	4300 kCal/kWh (during Stabilization)	4540 kCal/kWh (during stabilization)	4200 kCal/kWh (after stabilization)	4440 kCal/kWh (after stabilization)										
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	(xi) Gross Calorific Value	For Biomass based Power Plants 3400 kCal/kg																		
	(xii) Specific fuel consumption	3 kG/kWh for Biogas based Power Plants																		
	(xiii) Fuel Cost and Stock Cost	<ul style="list-style-type: none"> For Biomass, fuel price for plants commissioned during 2014-15 has been taken as Rs. 2450/MT and the variable component of tariff as per Regulations subject to revision of variable component. For Biogas Power Plants getting commissioned during 2014-15, feed stock price of Rs. 1175/MT (net of any cost recovery from digester equipment). The substrate price escalation factor has been considered as 5% for remaining years of useful life and the variable component of tariff as per regulations. 																		

	<p>(xiv) Subsidy or Incentive by the Central Govt. including Accelerated Depreciation (AD) benefits</p>	<ul style="list-style-type: none"> • Generation based incentive/tariff subsidy if any allowed by the Central/State Govt. would be governed by the terms and conditions of such scheme. • For Biomass and Biogas based Power Projects in addition to allowed 80% depreciation, an additional depreciation of 20% permitted to new assets acquired by generating company in the initial year has also been taken into account. 																																																		
	<p>(xv) Tariff period and Levelised Tariff</p>	<p>The fixed cost has been levelised for 20 years and applicable tariff has been determined for the useful life of the Biomass and Biogas for plants i.e. for 20 years considering both situations viz. if accelerated depreciation benefits is availed and not availed. Considering the said position, PPA would also have to be for a period of 20 years.</p> <p>Tariff for Biomass based power plants getting commissioned during FY 2014-15</p> <table border="1" data-bbox="540 554 1456 890"> <thead> <tr> <th colspan="3">Water cooled condenser</th> <th colspan="3">Air Cooled Condenser</th> </tr> </thead> <tbody> <tr> <td colspan="3">Fixed Charges (levelised for 20 years) (i) Without availing AD benefit -Rs.2.62/kWh (ii) With AD benefit availed: Rs.2.41/kWh</td> <td colspan="3">Fixed Charges (levelised for 20 years) (i) Without availing AD benefit: Rs. 2.86 kWh (ii) With AD benefit availed: Rs. 2.63/kWh</td> </tr> <tr> <th rowspan="2">Variable Charges (Rs./kWh)</th> <th colspan="2">Applicable Tariff (Rs/kWh)</th> <th rowspan="2">Variable Charges (Rs./kWh)</th> <th colspan="2">Applicable Tariff (Rs/kWh)</th> </tr> <tr> <th>With-out avail-ing AD benefit</th> <th>With-out availing AD benefit</th> <th>Without availing AD benefit</th> <th>With AD benefit availed</th> </tr> <tr> <td>3.48</td> <td>6.10</td> <td>5.89</td> <td>3.76</td> <td>6.62</td> <td>6.39</td> </tr> </tbody> </table> <p>Tariff for Biogas based Power Plants getting commissioned during FY 14-15</p> <p>Fixed Charges (levelised for 20 years) (i) Without availing AD benefit: Rs.3.47/kWh (ii) With AD benefit availed: Rs3.16/kWh</p> <table border="1" data-bbox="540 1022 1437 1341"> <thead> <tr> <th rowspan="2">Year</th> <th rowspan="2">Variable Charges (Rs./ kWh)</th> <th colspan="2">Applicable Tariff (Rs. / kWh)</th> </tr> <tr> <th>Without availing AD benefit</th> <th>With AD benefit availed</th> </tr> </thead> <tbody> <tr> <td>2014-15</td> <td>4.01</td> <td>7.48</td> <td>7.17</td> </tr> <tr> <td>2015-16</td> <td>4.21</td> <td>7.68</td> <td>7.37</td> </tr> <tr> <td>2016-17</td> <td>4.42 escalating 5% p.a. upto 20th years</td> <td>7.89</td> <td>7.58</td> </tr> <tr> <td>2017-18</td> <td>So on</td> <td>-</td> <td>-</td> </tr> </tbody> </table> <p>CDM benefits if availed shall be shared with the Licensee as laid down in the Regulations.</p>	Water cooled condenser			Air Cooled Condenser			Fixed Charges (levelised for 20 years) (i) Without availing AD benefit -Rs.2.62/kWh (ii) With AD benefit availed: Rs.2.41/kWh			Fixed Charges (levelised for 20 years) (i) Without availing AD benefit: Rs. 2.86 kWh (ii) With AD benefit availed: Rs. 2.63/kWh			Variable Charges (Rs./kWh)	Applicable Tariff (Rs/kWh)		Variable Charges (Rs./kWh)	Applicable Tariff (Rs/kWh)		With-out avail-ing AD benefit	With-out availing AD benefit	Without availing AD benefit	With AD benefit availed	3.48	6.10	5.89	3.76	6.62	6.39	Year	Variable Charges (Rs./ kWh)	Applicable Tariff (Rs. / kWh)		Without availing AD benefit	With AD benefit availed	2014-15	4.01	7.48	7.17	2015-16	4.21	7.68	7.37	2016-17	4.42 escalating 5% p.a. upto 20th years	7.89	7.58	2017-18	So on	-	-
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	<p>(xvi) Variable charges for Biomass Power Plants commissioned during 2009-14</p>	<ul style="list-style-type: none"> • The Biomass fuel price of Rs. 2450/MT for 2014-15 is also applicable to plants commissioned during 2009-14. This price is subject to revision prospectively and the variable components for such plants shall also be revised accordingly. • The variable charges for Biomass Power projects Commissioned earlier during 2009-14 based on fuel price of Rs.2450/MT shall be Rs. 3.43 kWh and Rs. 3.71/kWh for Water Cooled and Air Cooled Condensers respectively. Fixed charges shall remain same as determined under Regulations. • The tariff is applicable for the Biomass and Biogas Plants commissioned on or after 1-4-2014 and shall be in force till 31-03-2015. 																																																		