

**BIHAR ELECTRICITY REGULATORY COMMISSION**  
**Benchmarks for Tariff Determination for Biomass based Power Plants and Bagasse based Co-generation Plants to be commissioned in FY-2014-15. Order dated 22-09-2014**  
**Suo-motu Proceedings No. 11/2014**

Sl. No	Description	Summary																																										
1	<b>Title</b>	Benchmarks for Tariff Determination for Biomass based Power Plants and Bagasse based Co-generation to be commissioned in FY 2014-15																																										
2	<b>Applicability</b>	<ul style="list-style-type: none"> <li>To power generated from Bagasse based Co-generation plants and Biomass based plants to be commissioned in FY 2014-15</li> <li>Tariff determined by this order to continue till new tariff is determined</li> </ul>																																										
3	<b>Norms</b>	<p><b>a) Common Norms for Biomass, Biomass Gasifier and Bagasse based Power plants</b></p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Particulars</th> <th>BERC Existing Norms</th> </tr> </thead> <tbody> <tr> <td>i.</td> <td>Useful life</td> <td>20 years</td> </tr> <tr> <td>ii.</td> <td>Control period</td> <td>5 years (Biomass price review at the end of 3<sup>rd</sup> year)</td> </tr> <tr> <td>iii.</td> <td>Tariff period</td> <td>13 years for Biomass and Bagasse based plants 20 yrs for Biomass Gasifier plants</td> </tr> <tr> <td>iv.</td> <td>Debt-Equity</td> <td>70:30</td> </tr> <tr> <td>v.</td> <td>Interest Rate</td> <td>12.70%. SBI base rate during first six months of the previous year plus 300 basis points</td> </tr> <tr> <td>vi.</td> <td>Depreciation</td> <td>7% for first ten years and 2% for next ten years.</td> </tr> <tr> <td>vii.</td> <td>Return on Equity</td> <td>20% pa first 10 years (pre-tax) 24% pa from 11<sup>th</sup> years (pre-tax)</td> </tr> <tr> <td>viii.</td> <td>Interest on Working Capital</td> <td>13.20%. SBI base rate during first six months of the previous year plus 350 basis points</td> </tr> <tr> <td>ix.</td> <td>Loan Tenure</td> <td>10 years</td> </tr> <tr> <td>x.</td> <td>Discount Factor</td> <td>10.67% as specified in CERC order</td> </tr> </tbody> </table> <p><b>b) Biomass Based Plants:</b></p> <table border="1"> <thead> <tr> <th>Sl. No.</th> <th>Particulars</th> <th>BERC</th> </tr> </thead> <tbody> <tr> <td>i.</td> <td>O&amp;M Cost</td> <td>Rs 42.28 lakhs /MW for FY 2014-15</td> </tr> <tr> <td>ii.</td> <td>Capital cost</td> <td>                     For FY 2014-15  <b>Plants using Rice straw and Julifora</b> <ul style="list-style-type: none"> <li>Rs. 594.575 lakhs/MW based with water cooled condenser</li> <li>Rs. 634.885 lakhs/MW with Air cooled condenser</li> </ul> <b>Plants using Other than Rice straw and Julifora</b> <ul style="list-style-type: none"> <li>Rs. 544.187 lakhs/MW for projects with water cooled condenser</li> <li>Rs. 584.497 lakhs/MW for projects with Air cooled condenser</li> </ul>                     For details refer Annexure B of the Regulations                 </td> </tr> </tbody> </table>	Sl. No.	Particulars	BERC Existing Norms	i.	Useful life	20 years	ii.	Control period	5 years (Biomass price review at the end of 3 <sup>rd</sup> year)	iii.	Tariff period	13 years for Biomass and Bagasse based plants 20 yrs for Biomass Gasifier plants	iv.	Debt-Equity	70:30	v.	Interest Rate	12.70%. SBI base rate during first six months of the previous year plus 300 basis points	vi.	Depreciation	7% for first ten years and 2% for next ten years.	vii.	Return on Equity	20% pa first 10 years (pre-tax) 24% pa from 11 <sup>th</sup> years (pre-tax)	viii.	Interest on Working Capital	13.20%. SBI base rate during first six months of the previous year plus 350 basis points	ix.	Loan Tenure	10 years	x.	Discount Factor	10.67% as specified in CERC order	Sl. No.	Particulars	BERC	i.	O&M Cost	Rs 42.28 lakhs /MW for FY 2014-15	ii.	Capital cost	For FY 2014-15 <b>Plants using Rice straw and Julifora</b> <ul style="list-style-type: none"> <li>Rs. 594.575 lakhs/MW based with water cooled condenser</li> <li>Rs. 634.885 lakhs/MW with Air cooled condenser</li> </ul> <b>Plants using Other than Rice straw and Julifora</b> <ul style="list-style-type: none"> <li>Rs. 544.187 lakhs/MW for projects with water cooled condenser</li> <li>Rs. 584.497 lakhs/MW for projects with Air cooled condenser</li> </ul> For details refer Annexure B of the Regulations
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		iii.	PLF	i) 60% during stabilization (6 months) ii) 70% during remaining first year iii) 80% from 2 <sup>nd</sup> year.
		iv	Auxiliary Energy Consumption	11% during 1 <sup>st</sup> year and 10% from 2 <sup>nd</sup> year onwards for Power Projects with Water cooled condenser and 13% during 1 <sup>st</sup> year and 12% from 2 <sup>nd</sup> year onwards for projects with Air cooled condenser.
		v.	Station Heat Rate	4125 kCal/kWh
		vi.	Use of Fossil Fuel	Not Allowed.
		vii.	Working Capital	i) Fuel stock of four month equivalent to normative PLF. ii) O&M expenses for one month iii) Receivable equivalent to two months of fixed and variable charges. iv) Maintenance spares @ 15% of O&M expenses.
		viii.	Fuel price	Rs. 2730/MT for FY 2014-15
		ix.	Gross Calorific Value	3100 kCal/Kg
<b>(c) Bagasse Co-generation Plants</b>				
		<b>Sl. No.</b>	<b>Particulars</b>	<b>BERC</b>
		i.	O&M Cost	Rs.17.89 lakh/MW for 2014-15
		ii.	Capital cost	Rs. 440.708 Lakh/MW for 2014-15 For details refer Annexure-A of the Regulations
		iii.	PLF	53%
		iv.	Auxiliary energy consumption	8.5%
		v.	Station Heat Rate	3650kCal/kWh
		vi.	Gross Calorific Value	2275 kCal/Kg
		vii.	Fuel price	Rs1745/MT for FY 2014-15
		viii.	Working capital	<ul style="list-style-type: none"> <li>• Fuel stock of one month equivalent to normative PLF.</li> <li>• O&amp;M expenses for one month</li> <li>• 15% of O&amp;M for Spares</li> <li>• Receivable equivalent to two months of fixed and variable charges.</li> </ul>

		<b>(d)Biomass Gasifier Based Plants</b>			
		<b>Sl. No.</b>	<b>Particulars</b>	<b>BERC</b>	
		i.	O&M Cost	Rs. 44.71Lakh/MW for FY 2014-15	
		ii.	Capital cost	Rs. 427.118Lakh/MW for FY 2014-15 For details refer Annexure-C of the Regulations	
		iii.	PLF	85%	
		iv.	Auxiliary energy consumption	10%	
		v.	Specific Fuel Consumption	1.25 Kg/kWh	
		vi.	Fuel Price	Rs. 2730/MT for FY 2014-15	
<b>4</b>	<b>Fixed and Variable Cost of Plants commissioned in FY 2014-15 and Tariff</b>	<b>Particulars</b>	<b>Bagasse Cogeneration Plants</b>	<b>Biomass Plants(other than Rice straw and juliflora) with water cooled condenser</b>	<b>Biomass Gasifier Based Plants</b>
		Fixed cost	Rs. 2.47/kWh	Rs. 2.90/kWh	Rs. 2.44/kWh
		Fixed cost with AD	Rs. 2.27/kWh	Rs. 2.73/kWh	Rs. 2.32/kWh
		Fuel Cost	Rs. 3.06/kWh	Rs. 4.08/kWh	Rs. 3.79/kWh
		Tariff with AD	Rs. 5.33 / kWh	Rs. 6.81/kWh	Rs. 6.11/kWh
		<b>Note</b> <ul style="list-style-type: none"> <li>➤ Since Bihar has plenty of water, use of air cooled condenser to be restricted to places where water availability is poor and will be permitted on case to case basis</li> <li>➤ Developer to submit proposal to the Commission with certificate from Water Resources Department of the State Government about the non-availability of water on the location</li> <li>➤ Tariffs for Biomass projects with air cooled Condenser and plant based on rice straw/Juliflora with water cooled condenser and air cooled condenser have also been determined separately at Annexure vii, viii, ix, x, xi and xii (Refer Regulations)</li> </ul>			