JHARKHAND STATE ELECTRICITY REGULATORY COMMISSION

(Procurement of Power from Biomass and Non-fossil Fuel Based Co-generation Projects)

Order dated 27 January 2010

<table>
<tr><th>Sl. No.</th><th>Description</th><th>Summary</th></tr>
<tr><td>1.</td><td>Title</td><td>Jharkhand State Electricity Regulatory Commission, (Determination of Tariff for Procurement of Power from Biomass and Non-fossil Fuel Based Co-generation Projects). These Regulations shall come into force from the date of publication in official gazette (Publication on 28-01-2010)</td></tr>
<tr><td>2.</td><td>Definitions</td><td>As per these Regulations</td></tr>
<tr><td>3.</td><td>Applicability of the Order

Extent of Application</td><td>On or after the issue of this order. Control period shall start from the date of publication of this order in official gazette and shall extend upto 31-5-2015 and shall be applicable to projects which come up within the control period.
These Regulations shall apply to
(a) Bio-mass Power Projects
Minimum Steam pressure configuration of 62 bar and above using new plant and machinery based on Rankine Cycle technology and using biomass fuel sources provided use of fossil fuel (coal washing rejects dolochar etc.) is restricted only to 15% of total fuel consumption on annual basis.
(b) Non-fossil fuel based co-generation project:
Any facility that uses non-fossil fuel input for the power generation with steam pressure configuration of 40 bar and above and also utilizes the thermal energy generated for useful heat applications in other industrial activities simultaneously provided that the sum of useful power output and one half of useful thermal output is greater than 45% of facility's consumption during the season.
Cost parameters considered by JSERC for tariff determination
<table>
<tr><th>Parameters</th><th>Biomass (Combustion)</th><th>Biomass (Gasifier)</th><th>Non-fossil fuel based co-generation</th></tr>
<tr><td>Capital cost (Rs Cr/MW)</td><td>4.50</td><td>5.50</td><td>4.00</td></tr>
<tr><td>PLF</td><td>70%</td><td>70%</td><td>53%</td></tr>
<tr><td>Auxiliary consumption</td><td>10%</td><td>10%</td><td>8.50%</td></tr>
<tr><td>Heat rate (kCal/kWh)</td><td>3800</td><td>3800</td><td>3600</td></tr>
<tr><td>Calorific value (kCal/kg)</td><td>3467</td><td>3467</td><td>2250</td></tr>
<tr><td>Fuel cost (Rs/ MT)</td><td>1797</td><td>1797</td><td>1163</td></tr>
<tr><td>Fuel price escalation p.a</td><td>5%</td><td>5%</td><td>5%</td></tr>
<tr><td>O&M as % of capital cost</td><td>4.50%</td><td>4.50%</td><td>3.00%</td></tr>
<tr><td>O&M escalation per year</td><td>5.72%</td><td>5.72%</td><td>5.72%</td></tr>
<tr><td>Debt ratio</td><td>70:30</td><td>70:30</td><td>70:30</td></tr>
<tr><td>Interest on debt</td><td>SBI STPLR + 1.5%</td><td>SBI STPLR + 1.5%</td><td>SBI STPLR + 1.5%</td></tr>
<tr><td>Depreciation</td><td>1 to 10 yrs – 7%
11 to 20 yr – 2%</td><td>1 to 10 yrs – 7%
11 to 20 yr – 2%</td><td>1 to 10 yrs – 7%
11 to 20 yr – 2%</td></tr>
<tr><td>Return on Equity (pre-tax)</td><td>19% - 1st 10 yrs
24% - 11 to 20 yr</td><td>19% - 1st 10 yrs
24% - 11 to 20 yr</td><td>19% - 1st 10 yrs
24% - 11 to 20 yr</td></tr>
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<tr><td>4.</td><td>Determination of tariff</td><td>Biomass and Non-fossil Fuel Based Co-generation Projects would require tariff at which Distribution Licensee would procure power from these plants and sign PPA.</td></tr>
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	Tariff Principle	- Two Part tariff - Generalised tariff mechanism - Cost plus approach
	Components of Tariffs	
	(i) Capital Cost	Capital cost to include cost of (i) Plant & machinery (ii) civil works (iii) erection & commissioning (iv) IDC and (v) evacuation infrastructure upto inter-connection point.
	(ii) PLF	70%
	(iii) Depreciation	7% for first 10 years and 1.33 for remaining 10 years of total plant life considered as 20 years.
	(iv) Working Capital	Norms for working Capital (a) O&M expenses for one month (b) Receivable equivalent to 2 months of energy charges calculated on normative CUF. (c) Maintenance spare @ 15% of O&M expenses. An interest rate as 100 basis points above the average short term price lending rate (STPLR) of SBI during previous year.
5	**Other terms and Conditions**	-
	(i) Evacuation Infrastructure	STU shall bear 100% of the cost of evacuation infrastucture.
	(i) Other Key Drivers	Biomass Power projects wishing to avail control assistance (CFA) can use fossil fuel to provide a maximum of 15% of total consumption of energy in KCals on annual basis or as per DPR whichever is less.
	(ii) Mechanism for Monitoring utilization of Fuel	Each month project developers shall furnish to the beneficiary and JERDA a statement on monthly procurement and usage of fossil fuels duly certified by Chartered Accountant.
	(iii) Wheeling	To encourage biomass power projects and non fossil fuel based co-generation plants, third party sale and CPPs, 50% discount on wheeling charges applicable to conventional generation would be applicable.
	(iv) Banking	Recommended banking but 100% power banked during off peak period shall not be drawn during peak period.
	(v) Balancing and Settlement Mode	Plants less than 10 MW shall be treated as 'must run' plants and shall not be subjected to merit order dispatch. Plants above 10MW shall be subjected to scheduling and dispatch code as per Regulations and grid Code.
	(vi) Minimum Purchase Requirement	Minimum Renewable Obligation (REO) to purchase Biomass and Co-generation Energy by the distribution utility shall be 1.50% for 2010-11, 2% for 2011-12, 2.50% for 2012-13, 3% for 2013-14 and 3.50 for 2014-15.
	(vii) Evacuation Infrastructure	The State Transmission utility shall bear 100% of the cost of evacuation infrastructure
	(viii) Sharing of CDM benefits	100% to be retained by the project developer in the first year after date of commercial operation of the generating station. In the second year, 10% to the off-taker which shall be increased by 10% every year till it reaches 50% after which CDM benefits shall be shared equally between the project developer and energy off taker.
	(ix) Financial Benefits	(a) Government shall accord "Industrial Status" to non-conventional sources of power and all benefits available to the Industrial Units shall be made available to these plants. (i) Exemption of electricity duty for 10 years (ii) Exempted from Open access Charges (iii) Equipment exempted from commercial tax (iv) For purchase of Private land for project, exemption of 50% on stamp duty.
	(x) Single Window Clearance	The Commission suggests to the State Govt. for a practical and implementable single window clearance arrangement.
	(xi) Tariff Period	The tariff period of biomass and non fossil fuel based co-generation plants shall be 13 years during which the tariff determined under these Regulations by the Commission shall be applicable.
	(xii) Power to Remove difficulties, Power to Amend, Savings	Vested with the commission