

## 2.1 Form Template for Biomass Power Projects

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Assumptions
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Auxillary Consumption during stabilisation	%	10%
			Auxillary Consumption after stabilisation	%	10%
			PLF(Stablization for 6 months)	%	60%
			PLF(during first year after Stablization)	%	70%
			PLF(second year onwards)	%	80%
			Useful Life	Years	20
2	Project Cost	Capital Cost/MW	Power Plant Cost	Rs Lacs/MW	450
3	Financial Assumptions	Debt: Equity	Debt	%	70%
			Equity	%	30%
			Total Debt Amount	Rs Lacs	315
		Debt Component	Total Equity Amount	Rs Lacs	135
			Loan Amount	Rs Lacs	315
			Moratorium Period	years	0
			Repayment Period(incld Moratorium)	years	10
		Equity Component	Interest Rate	%	14.29%
			Equity amount	Rs Lacs	135
			Return on Equity for first 10 years	% p.a	19.00%
			RoE Period	Year	10.00
			Return on Equity after 10 years		24.00%
			Weighted average of ROE		21.50%
	Discount Rate (equiv. to WACC)		16.45%		
4	Financial Assumptions	Fiscal Assumptions	Income Tax	%	33.99%
			MAT Rate (for first 10 years)	%	16.995%
			80 IA benefits	Yes/No	Yes
		Depreciation	Depreciation Rate(power plant)	%	7.00%
			Depreciation Rate 11th year onwards	%	2.00%
			Years for 7% depreciation rate		10.00
5	Working Capital	For Fixed Charges	O&M Charges	Months	1
			Maintenance Spare	(% of O&M exepenses)	15%
		For Variable Charges	Receivables for Debtors	Months	2
			Biomass Stock	Months	4
		Interest On Working Capital	%	13.79%	
		6	Fuel Related Assumptions	Heat Rate	After Stabilisation period
During Stablization Period	Kcal/kwh				3800
Biomass	Base Price(FY09-10)			Rs/T	2092
	GCV - Biomass			Kcal/kg	3368
	Biomass Price Escalation Factor				5%
7	Operation & Maintenance	power plant	Total O & M Expenses	Rs Lakh	20.25
			Escalation	%	5.72%
8	Generation and Sale Of Energy	Working Hours/Day		Hrs	24

2.2 Form Template for (Biomass Power Projects- Punjab) : Determination of Tariff Component

Units Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU		5.89	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01	7.01
Auxiliary Consumption	MU		0.57	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Net Generation	MU		5.12	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31

Variable Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Biomass Cost	Rs Lakh		134.40	173.68	182.37	191.49	201.05	211.11	221.67	232.75	244.39	256.61	269.44	282.91	297.06	311.91	327.50	343.85	361.07	378.13	396.08	414.99

Fixed Cost	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs Lakh		20.25	21.41	22.63	23.93	25.30	26.74	28.27	29.89	31.60	33.41	35.32	37.34	39.47	41.73	44.12	46.64	49.31	52.13	55.11	58.27
Depreciation	Rs Lakh		31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50	31.50
Interest on term loan	Rs Lakh		42.76	38.26	33.76	29.26	24.76	20.26	15.75	11.25	6.75	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		12.98	15.71	16.29	16.90	17.54	18.23	18.95	19.72	20.53	21.39	21.98	23.05	24.17	25.34	26.58	27.87	29.24	30.67	32.18	33.76
Return on Equity	Rs Lakh		25.65	26.65	27.65	28.65	29.65	29.65	29.65	29.65	29.65	29.65	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40	32.40
<b>Total Fixed Cost</b>	<b>Rs Lakh</b>		<b>133.14</b>	<b>132.53</b>	<b>129.83</b>	<b>127.23</b>	<b>124.75</b>	<b>122.38</b>	<b>120.13</b>	<b>118.02</b>	<b>116.04</b>	<b>114.20</b>	<b>112.40</b>	<b>110.79</b>	<b>109.04</b>	<b>108.47</b>	<b>112.10</b>	<b>115.92</b>	<b>119.95</b>	<b>124.20</b>	<b>128.69</b>	<b>133.43</b>

Levelised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Variable COG	Rs/KWh		2.62	2.75	2.89	3.04	3.19	3.35	3.51	3.69	3.87	4.07	4.27	4.49	4.71	4.95	5.19	5.45	5.72	6.01	6.31	6.63
O&M expn	Rs/KWh		0.40	0.34	0.36	0.38	0.40	0.42	0.45	0.47	0.50	0.53	0.56	0.59	0.63	0.66	0.70	0.74	0.78	0.83	0.87	0.92
Depreciation	Rs/KWh		0.61	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Int. on term loan	Rs/KWh		0.83	0.61	0.54	0.46	0.39	0.32	0.25	0.18	0.11	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/KWh		0.25	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.33	0.34	0.35	0.37	0.38	0.40	0.42	0.44	0.46	0.49	0.51	0.54
RoE	Rs/KWh		0.50	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
<b>Total COG</b>	<b>Rs/KWh</b>		<b>5.22</b>	<b>4.85</b>	<b>4.96</b>	<b>5.05</b>	<b>5.17</b>	<b>5.29</b>	<b>5.42</b>	<b>5.56</b>	<b>5.71</b>	<b>5.88</b>	<b>6.04</b>	<b>6.18</b>	<b>6.38</b>	<b>6.67</b>	<b>6.97</b>	<b>7.29</b>	<b>7.63</b>	<b>7.98</b>	<b>8.35</b>	<b>8.74</b>

Levelised Tariff	Unit	Year-->	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Discount Factor			1	0.859	0.737	0.633	0.544	0.467	0.401	0.344	0.296	0.254	0.218	0.187	0.161	0.138	0.119	0.102	0.087	0.075	0.064	0.055
Variable Cost			177.1	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0	218.0
Fixed Cost			104.1	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2	128.2

Levelised Tariff (Variable)	3.40
Levelised Tariff (Fixed)	2.03
<b>Levelised Tariff</b>	<b>5.43 Rs/Unit</b>

**Determination of Accelerated Depreciation for Biomass Power Projects- Punjab**

Depreciation amount	90%
Book Depreciation rate	5.28%
Tax Depreciation rate	80%
Income Tax (MAT)	16.995%
Income Tax (Normal Rates)	33.99%
Capital Cost	450.0

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Book Depreciation	%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	0.24%	0.00%	0.00%
Book Depreciation	Rs Lakh	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	23.76	1.08	0.00	0.00

Accelerated Depreciation																						
Opening	%	100%	60%	12%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	40%	48.00%	9.60%	1.92%	0.38%	0.08%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Closing	%	60%	12%	2.40%	0.48%	0.10%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Accelerated Deprn.	Rs Lakh	180.00	216.00	43.20	8.64	1.73	0.35	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	156.24	192.24	19.44	-15.12	-22.03	-23.41	-23.69	-23.75	-23.76	-23.76	-23.76	-23.76	-23.76	-23.76	-23.76	-23.76	-23.76	-1.08	0.00	0.00	
Tax Benefit	Rs Lakh	26.55	32.67	3.30	-2.57	-3.74	-3.98	-4.03	-4.04	-4.04	-4.04	-4.04	-8.08	-8.08	-8.08	-8.08	-8.08	-8.08	-8.08	-0.37	0.00	0.00
Net Energy generation	MU	5.12	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	0.52	0.52	0.05	-0.04	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.13	-0.01	0.00	0.00
Discounting Factor		1.00	0.86	0.74	0.63	0.54	0.47	0.40	0.34	0.30	0.25	0.22	0.19	0.16	0.14	0.12	0.10	0.09	0.08	0.06	0.06	

<b>Levelised Benefit</b>	<b>0.10</b>	<b>Rs/ Unit</b>
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