

## Bio Mass Power Generation Plant

Plant Capacity 10000 KW

FIXED CAPITAL						Sub-Total Rs	Total Rs
	Description	Rs/Unit					
Plant capacity kw		10,000					
Plant & Machinery (@US\$ 1000/kWh)	1000				1,020,000,000		
Land, Land development and civil works					50,000,000		
Contingency (Laying of transmission lines)					51,000,000		
Development of 3000 acre land @ Rs 10,000					30,000,000		
						<b>1,151,000,000</b>	
WORKING CAPITAL						Sub-Total Rs	Total Rs
	No. of Units	Rs/Unit					
<b>Stocks:</b>							
Wood (20% Dry) (MT)	10,800	1 Month	2,000		21,600,000		
Water Treatment (Chemicals)		Two Month			636,364		
Machinery Spares					1,500,000		
						<b>23,736,364</b>	
<b>Debtors :</b>							
Electricity (kWh)	1,440,000	Two Month	8.50		12,240,000		
						<b>12,240,000</b>	
<b>Total Capital Costs</b>						<b>1,186,976,364</b>	
CAPITAL						Sub-Total Rs	Total Rs
<b>Equity (30%)</b>							
Investor					100,000,000		
						<b>100,000,000</b>	
<b>Loans (70%)</b>							
Long Term Loans (World Bank ESD II finance)		10.00%			712,185,818		
Overdraft		12.00%			374,790,545		
						<b>1,086,976,364</b>	
<b>Total Capital</b>						<b>1,186,976,364</b>	
REVENUE						Sub-Total Rs	Total Rs
	Units	Rs/Unit					
No of days Run/Yr	330						
Electricity (kWh) day	71,280,000		8.50		605,880,000		
<i>(90% of that Generated as 10% used for running power plant)</i>							
<b>Total Revenue</b>						<b>605,880,000</b>	
VARIABLE COST						Sub-Total Rs	Total Rs
	Units	Rs/Unit					
Wood Consumption kg/rwh	1.5						
Wood (20% Dry) (MT)	118,800		2000		237,600,000		
Water Treatment (Chemicals)					3,500,000		
						<b>241,100,000</b>	
FIXED PRODUCTION COST						Sub-Total Rs	Total Rs
	Units	Rs/Unit					
Wages	18		120,000		2,160,000		
Machinery O&M (4.0% of P&M)					42,340,000		
Depreciation					107,100,000		
						<b>152,100,000</b>	
OVERHEADS						Sub-Total Rs	Total Rs
	Units	Rs/Unit					
Remuneration	4		420,000		1,680,000		
Admin & Other Expenses					1,500,000		
Interest -Long Term Loan	712,185,818	10.0%			71,218,582		
-Overdraft	374,790,545	12.0%			44,974,865		
						<b>119,373,447</b>	
<b>Total Operating Costs</b>						<b>512,573,447</b>	
PROFIT						Sub-Total Rs	Total Rs
<b>Profit after Interest and before tax</b>						<b>93,306,553</b>	

SUMMARY					
Equity			100,000,000	Plant capacity	10000
Loans			1,086,976,364	Dollar Parity	102
Income			605,880,000	Cost of wood /kg dry	2000
Total Costs Excluding Interest			396,380,000	Interest rate	10.00%
Interest			116,193,447	O D Rate	12.00%
Costs before interest			396,380,000	Capital Cost US\$/KW	1000
Profit before Interest and Tax			209,500,000	Tariff Rs /KWh	8.50
Profit after Interest before Tax			93,306,553	Internal consumption %	0.1
Capital Employed (FA + Tot. WC )			1,186,976,364	No of Hrs Run/Yr	330
ROC (Return On Capital)			18%	Wood kg/kwh	1.5
ROSE			93%	Calorific value Kcal/kg	3700
Tax at 30%			27,991,966	Overall Efficiency	15.52
Profit after Interest and Tax			65,314,587		
IRR over 7 years			13%		
IRR over 20 years			19%		
Payback Period (Yrs)			5.7		

Cash Flow Estimates																					
Year ---->	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Avoided cost tariff	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	0.00	0.00	0.00	0.00	0.00	0.00
Tariff with Capacity charge	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50	8.50
Capital Cost	-1,151,000,000																				
Income	302,940,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000	605,880,000
Op Costs	-241,100,000	-241,100,000	-253,155,000	-253,155,000	-270,470,500	-265,812,750	-265,812,750	-279,103,388	-279,103,388	-307,013,726	-293,059,557	-293,059,557	-307,711,485	-307,711,485	-369,253,782	-323,097,059	-323,097,059	-339,251,912	-339,251,912	-339,251,912	-339,251,912
Fixed costs	-45,000,000	-45,000,000	-47,250,000	-49,612,500	-52,093,125	-54,687,781	-57,432,670	-60,304,304	-63,319,519	-66,485,495	-69,809,770	-73,300,259	-76,965,271	-80,813,535	-84,854,211	-89,096,922	-93,551,760	-98,229,356	-103,140,824	-108,297,866	-113,699,912
O/H	-3,180,000	-3,180,000	-3,338,000	-3,338,000	-3,505,950	-3,505,950	-3,681,247	-3,681,247	-3,865,310	-3,865,310	-4,058,575	-4,058,575	-4,261,504	-4,261,504	-4,474,579	-4,474,579	-4,698,308	-4,698,308	-4,933,224	-4,933,224	-4,933,224
Interest	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Net Income</b>	-1,151,000,000	13,880,000	316,800,000	302,136,000	299,773,500	271,810,425	281,863,519	278,953,332	262,791,061	259,591,784	228,515,469	238,953,098	236,462,610	216,941,740	213,093,476	147,297,428	189,211,440	184,532,885	163,700,423	158,554,040	153,396,999
Loan pay back on equal instalments over 7 years		101,740,831	101,740,831	101,740,831	101,740,831	101,740,831	101,740,831	101,740,831	101,740,831												
Net cash after loan repayment	-1,151,000,000	13,880,000	214,859,169	200,395,169	198,032,669	170,069,594	180,122,688	177,212,501	161,050,230	259,591,784	228,515,469	238,953,098	236,462,610	216,941,740	213,093,476	147,297,428	189,211,440	184,532,885	163,700,423	158,554,040	153,396,999
IRR for tariff over 8 years	13%																				
IRR @ Rs. 8.5 for 20 years	19%																				
Weighted Avg Cost of Capital	10.84%																				
<b>Assumptions for cash flow calculations</b>																					
<b>Price of Fuel wood delivered assumed as Rs 2000.00 per ton</b>																					
5% increase in O & M costs every two years																					
10 % increase in year 5 , 10 and 20% on year 15 for Overhaul																					
Tariff of Rs. 8.5 is used																					
Tariff remains unchanged.																					
Fixed costs increase 5% per year																					
Fixed costs are less depreciation																					
O/H less interest increase by 5% every 2 years																					
Repayment of loan over 7 years																					
2 year grace on repayment of loans																					
330 day operation throughout the project period																					
All generation net of internal accepted by the grid																					
For Weighted Avg Cost of Capital, return on equity assumed at 20%, and loan interest 10%																					
Vat and import duties not included in the costing																					