PROJECT REPORT

Of

BIOGAS

PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding **Biogas**.

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

[We can modify the project capacity and project cost as per your requirement. We can also prepare project report on any subject as per your requirement.]

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PROJECT AT A GLANCE

1	Name of the Entreprenuer		xxxxxxxxxx	
2	Constitution (legal Status)		xxxxxxxxxx	
3	Father / Spouse Name		xxxxxxxxxxxx	
4	Unit Address	:	xxxxxxxxxxxxxxxxxxxxxxx	
			District : xxxxxxx	
			Pin: xxxxxxx	State: xxxxxxxxxx
			Mobile xxxxxxx	
5	Product and By Product	:	**BIOGAS**	
6	Name of the project / business activity proposed :		**BIOGAS UNIT**	
7	Cost of Project	:	Rs.20.28 Lakhs	
8	Means of Finance			
	Term Loan		Rs.15.75 Lakhs	
	Own Capital		Rs.2.03 Lakhs	
	Working Capital		Rs.2.5 Lakhs	
9	Debt Service Coverage Ratio	:	1.87	
10	Pay Back Period	:	5	Years
11	Project Implementation Period	:	5-6	Months
12	Break Even Point	:	54%	
13	Employment	:	8	Persons
14	Power Requirement	:	20.00	HP
15	Major Raw materials	:	Crop waste, Animal waste,Municipal waste,Agro-industry waste,Forest waste	
16	Estimated Annual Sales Turnover (Max Capacity)	:	43.15	Lakhs
17	Detailed Cost of Project & Means of Finance			

COST OF PROJECT

(Rs. In Lakhs)

Particulars	Amount
Land	Own/Rented
Plant & Machinery	17.00
Furniture & Fixtures	0.50
Working Capital	2.78
Total	**20.28**

MEANS OF FINANCE

Particulars	Amount
Own Contribution	2.03
Working Capital(Finance)	2.50
Term Loan	15.75
Total	**20.28**

BIOGAS

Introduction: Biogas is a flammable gas that accrues from the fermentation of biomass in biogas plants. Biogas typically refers to a gas produced by the biological breakdown of organic matter in the absence of oxygen. Biogas originates from biogenic material and is a type of biofuel. Biogas is a renewable source of energy. Organic waste such as dead plant and animal material, animal dung and kitchen waste can be converted into a gaseous fuel called biogas. Biogas comprises primarily methane (CH_4) and carbon dioxide and may have small amounts of hydrogen sulphide (H_2S) moisture and siloxanes. The gases methane, hydrogen and carbon monoxide(CO) can be combusted or oxidised with oxygen. Biogas can be used as a fuel for any heating purpose such as cooking. It can also be used in a gas engine to convert the energy in the gas into electricity and heat. Biogas can be compressed much like natural gas, and used to power motor vehicles.

Biogas Plant: A biogas plant is the name often given to an anaerobic digester that treats waste or energy crops. Biogas can be produced using anaerobic digesters. A biogas plant consists of the following things:

- Concrete tank (digester)- The bio wastes are digested here by the microbes here so as obtain the methane gas.
- Floating Cover- It is placed over the tank and it keeps on rising as the quantity of gas keeps on increasing in the tank.
- Outlet – The outlet is connected to a pipe through which the gas is extracted and further used
- Slurry Collector- Here cow dung is added to rest of the bio waste with water and as Cowdung which contains bacteria methanogens, which is present in the rumen part of the stomach of cattle, that acts the bio wastes and produce methane gas.
- Sludge Collector- The Spent slurry is removed through this section and can be used as fertilizer for various purposes.

Uses & Market Potential: Biogas is environment friendly and has various applications. They are cooking, drying, cooling, heating etc. It is used in producing electricity, methanol and production of steam. Below are the same other biogas uses in different fields:

- Biogas for home
- Biogas for electricity
- Provides decentralised fuel supply and waste management.
- Gas is useful as a fuel substitute for fire wood, dung, agricultural residues, petrol diesel and electricity.
- Best boon in waste management.
- Bio-CNG

Biogas has emerged as a promising renewable technology to convert agricultural, animal, industrial and municipal wastes into energy. Biogas development can be integrated with strategies to improve sanitation as well as reduce indoor air pollution and greenhouse gases. Currently, the total biogas production in India is 2.07 billion m3/year. Biomass is one of the major energy sources used in rural India covering nearly 96% of energy sources, however its utilization is highly inefficient due to a lack of proper stoves in most households.

Raw Material: Major raw materials are as follows:

1. Crop waste
2. Animal waste
3. Municipal waste
4. Agro-industry waste
5. Forest waste

Assuming average raw material cost per Kg Rs. 3 -5.

Machinery requirement: Major machinery & equipments are:

S No.	Machine	Unit	Price
1.	Biogas Plant	1	1000000
2.	FRP Tank (5 m x 5 m)	1	115000
3.	Surry Storage Tank (5m x 5m)	1	115000
4.	Sledge Pump to Pump the waste	1	95000
5.	Crusher Machine (5 HP)	1	325000
6.	Excavation	1	50000
	Total Amount		**1700000**

Manufacturing Process: Biogas Production Process (Food Waste & Cow dung)

The various food waste are procured form agro-industry & municipal bodies, while the Cow dung is obtained from dairy farms & farmer groups. All these raw material are stored in appropriate storage facilities composed of bins and appropriate enclosing structure. The food waste is sent to crusher which essentially crushes the various sizes food waste into an appropriate size & form to be used for making slurry. This crushed food waste, along with Cow dung is added to slurry tank with water. The slurry tank has its own agitator to form a uniform slurry. The Slurry is then pumped into digester of biogas plant which essentially decomposes the organic waste, releasing mostly methane and other gases, which are collectively called as biogas. The gas deposits in dome or floating cover, from where it's extracted via flow control valve periodically. The used slurry or sludge is pumped out of digester into a sludge tank which can be used as manure. The biogas is collected in a large gas receiver from, where it's sucked in by compressor and collected in its receiver, which acts as a temporary holding tank. This gas is then either filled in gas cylinders utilizing appropriate pressure regulator & valves; which are later sold or gas is simply filled in a large pressure vessel from where the supply is provided to customers via regulator & pipeline arrangement.

Area:

The industrial setup requires space for Inventory, workshop or manufacturing area, space for power supply utilities and auxiliary like Generator setup. Also some of the area of building is required for office staff facilities, documentation, office furniture, etc. Thus, the approximate total area required for complete industrial setup is 2000 to 2500Sqft.

Power Requirement –The power consumption required to run all the machinery could be approximated as 20hp

Manpower Requirement– There are requirement of skilled machine operators to run the machine set. Experience quality engineers are required

for desired quality control. Some helpers are also required to transfer the material from one work station to other. Office staffs are required to maintain the documentation. The approximate manpower required is 8 including 1 Supervisor, 1 Plant operator, 1 unskilled worker, 1 Helper and 1 Security guard. 3 Skilled worker including Accountant, Manager and Sales person.

Bank Term Loan: Rate of Interest is assumed to be at 11%

Depreciation: Depreciation has been calculated as per the Provisions of Income Tax Act, 1961

Approvals & Registration Requirement:

Basic registration required in this project:

- GST Registration
- Udyog Aadhar Registration (Optional)
- Fire/pollution license as required
- PESO License
- Choice of a Brand Name of the product and secure the name with Trademark if required.

Implementation Schedule:

S No.	Activity	Time required
1.	Acquisition of premises	1-2 Months
2.	Procurement & installation of Plant & Machinery	1-2 Months
3.	Arrangement of Finance	1.5-2 Months
4.	Requirement of required Manpower	1 Month
5.	Commercial Trial Runs	1 Month
	Total time Required (some activities shall run concurrently)	5-6 Months

FINANCIALS

PROJECTED CASH FLOW STATEMENT

PARTICULARS	I	II	III	IV	V
SOURCES OF FUND					
Own Contribution	2.03	-			
Reserve & Surplus	2.14	3.47	4.79	6.47	8.70
Depriciation & Exp. W/off	2.60	2.21	1.88	1.60	1.36
Increase In Cash Credit	2.50				
Increase In Term Loan	15.75	-	-	-	-
Increase in Creditors	0.16	0.02	0.03	0.03	0.03
TOTAL :	**25.17**	**5.70**	**6.70**	**8.11**	**10.09**
APPLICATION OF FUND					
Increase in Fixed Assets	17.50	-	-	-	-
Increase in Stock	0.55	0.09	0.11	0.11	0.12
Increase in Debtors	2.57	0.43	0.41	0.44	0.46
Repayment of Term Loan	1.75	3.50	3.50	3.50	3.50
Taxation	-	-	-	0.65	0.87
Drawings	1.00	1.50	2.00	3.00	4.00
TOTAL :	**23.37**	**5.53**	**6.02**	**7.70**	**8.95**
Opening Cash & Bank Balance	-	1.80	1.98	2.66	3.07
Add : Surplus	1.80	0.18	0.68	0.41	1.14
Closing Cash & Bank Balance	**1.80**	**1.98**	**2.66**	**3.07**	**4.21**

PROJECTED BALANCE SHEET

PARTICULARS	I	II	III	IV	V
SOURCES OF FUND					
Capital Account					
Opening Balance	-	3.17	5.14	7.92	10.75
Add: Additions	2.03	-	-	-	-
Add: Net Profit	2.14	3.47	4.79	5.83	7.83
Less: Drawings	1.00	1.50	2.00	3.00	4.00
Closing Balance	3.17	5.14	7.92	10.75	14.57
CC Limit	2.50	2.50	2.50	2.50	2.50
Term Loan	14.00	10.50	7.00	3.50	-
Sundry Creditors	0.16	0.18	0.21	0.24	0.27
TOTAL :	**19.82**	**18.32**	**17.63**	**16.99**	**17.34**
APPLICATION OF FUND					
Fixed Assets (Gross)	17.50	17.50	17.50	17.50	17.50
Gross Dep.	2.60	4.81	6.70	8.30	9.66
Net Fixed Assets	14.90	12.69	10.80	9.20	7.84
Current Assets					
Sundry Debtors	2.57	3.01	3.42	3.85	4.31
Stock in Hand	0.55	0.65	0.75	0.87	0.98
Cash and Bank	1.80	1.98	2.66	3.07	4.21
TOTAL :	**19.82**	**18.32**	**17.63**	**16.99**	**17.34**
	-	-	-	-	-

PROJECTED PROFITABILITY STATEMENT

PARTICULARS	I	II	III	IV	V
A) SALES					
Gross Sale	9.98	12.33	14.36	16.53	18.85
Sale of By-Product(Slurry)	15.75	17.72	19.80	21.99	24.30
Total (A)	**25.73**	**30.05**	**34.16**	**38.52**	**43.15**
B) COST OF SALES					
Raw Material Consumed	3.15	3.60	4.20	4.85	5.40
Elecricity Expenses	2.26	2.42	2.58	2.74	2.90
Repair & Maintenance	1.50	1.85	2.15	2.48	2.83
Labour & Wages	7.69	8.84	9.90	11.29	12.41
Depreciation	2.60	2.21	1.88	1.60	1.36
Cost of Production	17.19	18.92	20.71	22.95	24.91
Add: Opening Stock /WIP	-	0.45	0.53	0.61	0.70
Less: Closing Stock /WIP	0.45	0.53	0.61	0.70	0.80
Cost of Sales (B)	16.74	18.84	20.63	22.86	24.81
C) GROSS PROFIT (A-B)	8.98	11.21	13.53	15.66	18.34
	34.92%	**37.31%**	**39.60%**	**40.65%**	**42.50%**
D) Bank Interest (Term Loan)	1.71	1.40	1.01	0.63	0.24
ii) Interest On Working Capital	0.28	0.28	0.28	0.28	0.28
E) Salary to Staff	4.66	5.83	7.17	7.96	8.75
F) Selling & Adm Expenses Exp.	0.20	0.25	0.29	0.33	0.38
TOTAL (D+E)	**6.84**	**7.74**	**8.74**	**9.19**	**9.64**
H) NET PROFIT	2.14	3.47	4.79	6.47	8.70
	8.3%	**11.5%**	**14.0%**	**16.8%**	**20.2%**
I) Taxation	-	-	-	0.65	0.87
J) PROFIT (After Tax)	2.14	3.47	4.79	5.83	7.83

COMPUTATION OF MAKING OF BIOGAS			
Item to be Manufactured Biogas			
Manufacturing Capacity per day		1500	Kg
No. of Working Hour		8	
No of Working Days per month		25	
No. of Working Day per annum		300	
Total Production per Annum		4,50,000.00	
Final Product			
Gas Produced per day		300.00	Cubic meter
Power generated per day		375.00	unit
Power generated per annum		1,50,000	unit
Total Production per Annum		1,50,000	unit
Year		Capacity	BIOGAS
		Utilisation	
I		70%	1,05,000.00
II		75%	1,12,500.00
III		80%	1,20,000.00
IV		85%	1,27,500.00
V		90%	1,35,000.00

Raw Material Consumed	Capacity	Rate per Kg	Amount (Rs.)
	Utilisation		
I	70%	3.00	3.15
II	75%	3.20	3.60
III	80%	3.50	4.20
IV	85%	3.80	4.85
V	90%	4.00	5.40

COMPUTATION OF SALE					
Particulars	**I**	**II**	**III**	**IV**	**V**
Op Stock	-	5,250.00	5,625.00	6,000.00	6,375.00
Production	1,05,000.00	1,12,500.00	1,20,000.00	1,27,500.00	1,35,000.00
	1,05,000.00	1,17,750.00	1,25,625.00	1,33,500.00	1,41,375.00
Less : Closing Stock(15 Days)	5,250.00	5,625.00	6,000.00	6,375.00	6,750.00
Net Sale	99,750.00	1,12,125.00	1,19,625.00	1,27,125.00	1,34,625.00
Sale Price per unit	10.00	11.00	12.00	13.00	14.00
Sale (in Lacs)	**9.98**	**12.33**	**14.36**	**16.53**	**18.85**

Computation of By Product(Slurry)				
Production	**Capacity**	**Unit**	**Rate**	**Total**
I	70%	315000	5.00	15.75
II	75%	337500	5.25	17.72
III	80%	360000	5.50	19.80
IV	85%	382500	5.75	21.99
V	90%	405000	6.00	24.30

BREAK UP OF LABOUR				
Particulars		Wages	No of	Total
		Per Month	Employees	Salary
Supervisor		20,000.00	1	20,000.00
Plant Operator		15,000.00	1	15,000.00
Unskilled Worker		12,000.00	1	12,000.00
Helper		8,000.00	1	8,000.00
Security Guard		6,000.00	1	6,000.00
				61,000.00
Add: 5% Fringe Benefit				3,050.00
Total Labour Cost Per Month				64,050.00
Total Labour Cost for the year (In Rs. Lakhs)			5	7.69

BREAK UP OF SALARY				
Particulars		Salary	No of	Total
		Per Month	Employees	Salary
Manager		20,000.00	1	12,000.00
Accountant cum store keeper		15,000.00	1	15,000.00
Sales		10,000.00	1	10,000.00
Total Salary Per Month				37,000.00
Add: 5% Fringe Benefit				1,850.00
Total Salary for the month				38,850.00
Total Salary for the year (In Rs. Lakhs)			3	4.66

COMPUTATION OF CLOSING STOCK & WORKING CAPITAL					
PARTICULARS	I	II	III	IV	V
Finished Goods					
	0.45	0.53	0.61	0.70	0.80
Raw Material					
	0.11	0.12	0.14	0.16	0.18
Closing Stock	**0.55**	**0.65**	**0.75**	**0.87**	**0.98**

COMPUTATION OF WORKING CAPITAL REQUIREMENT			
Particulars	**Amount**	**Margin(10%)**	**Net Amount**
Stock in Hand	0.55		
Less:			
Sundry Creditors	0.16		
Paid Stock	**0.39**	**0.04**	**0.35**
Sundry Debtors	2.57	0.26	2.32
Working Capital Requirement			**2.67**
Margin			0.30
MPBF			**2.67**
Working Capital Demand			**2.50**

COMPUTATION OF DEPRECIATION				
Description	Land	Plant & Machinery	Furniture	**TOTAL**
Rate of Depreciation		**15.00%**	**10.00%**	
Opening Balance	Leased	-	-	-
Addition	-	17.00	0.50	17.50
	-	17.00	0.50	17.50
		-	-	
TOTAL		17.00	0.50	17.50
Less : Depreciation	-	2.55	0.05	2.60
WDV at end of Ist year	-	14.45	0.45	14.90
Additions During The Year	-	-	-	-
	-	14.45	0.45	14.90
Less : Depreciation	-	2.17	0.05	2.21
WDV at end of IInd Year	-	12.28	0.41	12.69
Additions During The Year	-	-	-	-
	-	12.28	0.41	12.69
Less : Depreciation	-	1.84	0.04	1.88
WDV at end of IIIrd year	-	10.44	0.36	10.80
Additions During The Year	-	-	-	-
	-	10.44	0.36	10.80
Less : Depreciation	-	1.57	0.04	1.60
WDV at end of IV year	-	8.87	0.33	9.20
Additions During The Year	-	-	-	-
	-	8.87	0.33	9.20
Less : Depreciation	-	1.33	0.03	1.36
WDV at end of Vth year	-	7.54	0.30	7.84

REPAYMENT SCHEDULE OF TERM LOAN						11.0%	
Year	**Particulars**	**Amount**	**Addition**	**Total**	**Interest**	**Repayment**	**Cl Balance**
I	Opening Balance						
	Ist Quarter		15.75	15.75	0.43	-	15.75
	Iind Quarter	15.75	-	15.75	0.43	-	15.75
	IIIrd Quarter	15.75	-	15.75	0.43	0.88	14.88
	Ivth Quarter	14.88	-	14.88	0.41	0.88	14.00
					1.71	1.75	
II	Opening Balance						
	Ist Quarter	14.00	-	14.00	0.39	0.88	13.13
	Iind Quarter	13.13	-	13.13	0.36	0.88	12.25
	IIIrd Quarter	12.25	-	12.25	0.34	0.88	11.38
	Ivth Quarter	11.38		11.38	0.31	0.88	10.50
					1.40	3.50	
III	Opening Balance						
	Ist Quarter	10.50	-	10.50	0.29	0.88	9.63
	Iind Quarter	9.63	-	9.63	0.26	0.88	8.75
	IIIrd Quarter	8.75	-	8.75	0.24	0.88	7.88
	Ivth Quarter	7.88		7.88	0.22	0.88	7.00
					1.01	3.50	
IV	Opening Balance						
	Ist Quarter	7.00	-	7.00	0.19	0.88	6.13
	Iind Quarter	6.13	-	6.13	0.17	0.88	5.25
	IIIrd Quarter	5.25	-	5.25	0.14	0.88	4.38
	Ivth Quarter	4.38		4.38	0.12	0.88	3.50
					0.63	3.50	
V	Opening Balance						
	Ist Quarter	3.50	-	3.50	0.10	0.88	2.63
	Iind Quarter	2.63	-	2.63	0.07	0.88	1.75
	IIIrd Quarter	1.75	-	1.75	0.05	0.88	0.88
	Ivth Quarter	0.88		0.88	0.02	0.88	-
					0.24	3.50	

Door to Door Period	60	Months
Moratorium Period	6	Months
Repayment Period	54	Months

CALCULATION OF D.S.C.R					
PARTICULARS	**I**	**II**	**III**	**IV**	**V**
CASH ACCRUALS	4.74	5.68	6.67	7.43	9.19
Interest on Term Loan	1.71	1.40	1.01	0.63	0.24
Total	6.45	7.08	7.68	8.05	9.43
REPAYMENT					
Repayment of Term Loan	1.75	3.50	3.50	3.50	3.50
Interest on Term Loan	1.71	1.40	1.01	0.63	0.24
Total	3.46	4.90	4.51	4.13	3.74
DEBT SERVICE COVERAGE RATIO	**1.86**	**1.45**	**1.70**	**1.95**	**2.52**
AVERAGE D.S.C.R.			**1.87**		

COMPUTATION OF ELECTRICITY				
(A) POWER CONNECTION				
Total Working Hour per day		Hours	8	
Electric Load Required		HP	20	
Load Factor			0.7460	
Electricity Charges		per unit	7.50	
Total Working Days			300	
Electricity Charges				2,68,560.00
Add : Minimim Charges (@ 10%)				
(B) DG set				
No. of Working Days			300	days
No of Working Hours			0.3	Hour per day
Total no of Hour			90	
Diesel Consumption per Hour			8	
Total Consumption of Diesel			720	
Cost of Diesel			65.00	Rs. /Ltr
Total cost of Diesel			0.47	
Add : Lube Cost @15%			0.07	
Total			**0.54**	
Total cost of Power & Fuel at 100%				3.22
Year		**Capacity**		**Amount**
				(in Lacs)
I		70%		2.26
II		75%		2.42
III		80%		2.58
IV		85%		2.74
V		90%		2.90

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