



MODEL PROJECT REPORT



PROJECT REPORT ON BIO GAS

SWAVALAMBI BHARAT ABHIYAN

PROJECT AT A GLANCE

- 1 Name of the Entrepreneur : xxxxxxxxx
- 2 Constitution (legal Status) : xxxxxxxxx
- 3 Father / Spouse Name : xxxxxxxxxxxx
- 4 Unit Address : xxxxxxxxxxxxxxxxxxxxxxxxx
- District : xxxxxxxx
- Pin: xxxxxxxx State: xxxxxxxxxxxx
- Mobile xxxxxxxx
- 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 from agro-industry & municipal bodies, while the Cow dung is obtained from dairy farms & farmer groups. All these raw materials 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 of 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 2500 Sqft.

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

Manpower Requirement– There are requirements of skilled machine operators to run the machine set. Experienced 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
<u>SOURCES OF FUND</u>					
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
<u>APPLICATION OF FUND</u>					
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
<u>SOURCES OF FUND</u>					
<u>Capital Account</u>					
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
<u>APPLICATION OF FUND</u>					
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

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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
Electricity 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

<u>COMPUTATION OF SALE</u>					
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

<u>BREAK UP OF LABOUR</u>				
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

<u>BREAK UP OF SALARY</u>				
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
<u>Finished Goods</u>					
	0.45	0.53	0.61	0.70	0.80
<u>Raw Material</u>					
	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 IIInd 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	CI 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

<u>CALCULATION OF D.S.C.R</u>					
PARTICULARS	I	II	III	IV	V
<u>CASH ACCRUALS</u>	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
<u>REPAYMENT</u>					
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		

<u>COMPUTATION OF ELECTRICITY</u>				
<u>(A) POWER CONNECTION</u>				
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%)				
<u>(B) DG set</u>				
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