

PROJECT PROFILE

ON

SHG - OTHER INDUSTRIES

BIO-GAS PLANT

Month & Year
December 2008

**PREPARED BY
TANSTIA-FNF SERVICE CENTRE
B-22, INDUSTRIAL ESTATE
CHENNAI-600032**

Supported by

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STIFTUNG **FÜR DIE FREIHEIT**

BIO-GAS PLANT

INTRODUCTION

Bio-gas provides a useful and economic alternate energy source. Wastage is converted into energy, one such thing is cow dung, the animal discharge is converted as bio-gas. Biogas can be used for cooking, lighting and operating simple type of machinery which may be using petrol, kerosene and Diesel. The biogas plants enjoy good demand they are perennial source of energy. The different models of biogas plants available are varying from 2 Cubic metres to 1430 Cubic metres per day.

MARKET

Biogas is a clean and efficient fuel, generated from cow-dung, human waste or any kind of biological materials derived through anaerobic fermentation process. The Biogas consists of 60% methane and rest carbon-di-oxide mainly. Biogas plants provide safe fuel for cooking and light. The by-product , a solid residue is a high grade manure. The Biogas plants are the cheap sources of energy in rural areas.

The types of Biogas plant designs more popular are : Floating drum type KVIC design, Fixed dome-type and Bag-type portable digester made of rubberized nylon fabric. Nearly 28.50 lacs Biogas plants have been installed in the country saving thus Rs.435 Crore fuel per annum.

State Governments, State Corporate and registered bodies , The KVIC implements Biogas programme. Also the non- Governmental organizations implements the programme with the help of Government bodies and world organisations. Government bodies provide technical and financial subsidy and support to the consumers and also to the entrepreneurs and corporate bodies for installation of Biogas plants.

INSTALLED CAPACITY

The installed capacity of the proposed unit is the manufacturing of 60 Nos 6 cubic metre Bio-Gas Plants per annum.

PLANT AND MACHINERY

The following items of plant and machinery are required for the project.

	Qty	Rs
Arc welding Transformer 300 amps with accessories	1	12000
Hand shearing machine (to cut up to 4 mm brick plates)	1	7000
Bench Drilling machine 12 mm	1	30000
Flexible Shaft grinder	1	6000
Measuring instruments & tools		3000
TOTAL		64000

MANUFACTURING PROCESS

Flow chart

The main components of biogas plant are the following

II

concrete foundation - Civil work

II

Digester

II

Dome flanks plate

II

Inlet and outlet chamber

II

Gas blower

II

Centre guides

II

Pipelines and fittings

II

The following items are also required

II

Gas valve

II

Two way connections

II

Sockets

II

PVC pipes for carrying gas to gate valve.

The above mentioned items are fabricated in-house
and assembled at customer's premises

TECHNOLOGY FOR BIO-GAS PLANT

Any organic matter when subjected to decomposition in the absence of air gives rise to gas, which is rich in methane and also contains Carbon dioxide, Hydrogen sulphide etc.

Two types of plants are constructed (1) Floating drum type and (2) Fixed dome type. The technology is very simple and user friendly. A plant consists of an (1) Inlet tank (2) digester (3) Outlet tank and (4) gas distribution system

RAW MATERIALS

The raw material required for the production at full capacity is given below

For	Nos	Qty	Rate	Value
Quantity	60			
KGs				
MS Plates 3-4 mm thick flange plates 300X300X6 mm- MTs	30		25000.00	750000
Gas Blower				
Ms angles 35X35X5 mm				
Pipes & flange fittings				1000
Bricks	6000 nos			6000
Cement				9000
Coarse fine sand				6000
Brick & stone rubber				2000
Sockets 20mm dia 200 mm				5000
running meter pipes (PVC)				
gas valves two way connections				
fasteners, paints				
Consumables, welding electrodes				2000
bushes, waste				
Total				781000
TOTAL	60 nos	Rs. lakhs		7.81
for				
Raw material cost per piece				13016.67

LOCATION LAND AND BUILDING

The infrastructural facilities required for the project by way of land and building are the following.

Built up area-Sq.ft	1000
Rent p.m.-Rs	2000
Advance-10 months.Rs	20000

UTILITIES

The utilities required for the project are the following

Three phase	KW	7.50
Power charges	Rs.lakhs p.a	0.11
Water-For process-	Litres per day	0
For human consumption		200

MANPOWER

The manpower requirement for the project is given below

		Monthly wages	Total
Supervisor	1	3000.00	3000.00
Skilled	1	2000.00	2000.00
Helpers	3	1500.00	4500.00
Sales man	1	2000.00	2000.00

sub total		11500.00
Add benefits	20%	2300.00
Total per month		13800.00
TOTAL PER ANNUM-Rs. lakhs		1.66

COST OF PROJECT AND MEANS OF FINANCE

The cost of project and Means of Finance is estimated as given below

1. COST OF PROJECT

	[Rs.lakhs]
Land & Building (Advance)	0.20
Plant & Machinery	0.64
Other Misc. assets	0.03
Pre-Operative expenses	0.05
Margin for WC	0.10
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	1.02
	<hr/>

2. MEANS OF FINANCE

Capital	0.54
Term Loan	0.48
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	1.02
	<hr/>

-The term loan proposed is 75% of the Plant and machinery.

- The promoters will bring in the required capital contribution to the project.

COST OF PRODUCTION AND PROFITABILITY

A cost and profitability statement projected for the first 5 years of operations is given in Annexure. The profitability is based on the following assumptions.

Assumptions

Installed capacity	60 Bio-gas plants per annum
Capacity utilisation	Year-1 -60% Year -2 -70% Year-3 onwards- 80%
Selling price	Rs.25000 per Bio-gas plant
Raw materials	As per the details given above
Power	Rs.0.86 lakh per annum at 100%
Wages and salaries	Rs. 1.66 lakhs with increase 5% every year.
Repairs and Maintenance	Rs.0.06 lakh per annum
Depreciation	Written down value method -15 % on machinery
Selling general and administrative expenses	Rs.8000 per month
Interest on Term loan	10% per annum
Interest on working capital	10 % per annum
Income tax	33.66 % on profits

ASSESSMENT OF WORKING CAPITAL

The following levels are projected for working capital

	Months	Values	%	Margin	Bank
	Consumptions			Amount	Finance
Raw Materials	0.50	0.20	25%	0.05	0.15
Expenses	1.00	0.05	100%	0.05	0.00
		0.25		0.10	0.15

A bank finance of Rs 0.15 lakh is required by the unit for meeting the working capital

PROFITABILITY RATIOS

The project ensures good profits on investment and sales turnover.

DEBT SERVICE COVERAGE RATIO

The debt service coverage ratio of this concern is very high as the Term loan component is too low and the returns are high in this project.

BREAK EVEN LEVEL

The break even level of the unit is 47% of the installed capacity

TECHNOLOGY AND DESIGN SOURCE OF BIO-GAS PLANTS

The Director (BT)
Directorate of Bio-Technology
Khadi & Village Industries Commission,
3, Irla Road, Vile Parle (W), Mumbai – 400 056.
Tele/Fax : 022 – 2671 1052

Khadi & village Industries Commission
Gopalapuram
Chennai 600 014

LIST OF MACHINERY SUPPLIERS

Machine Tools

1. Quality Machine Tools
New No.238 Linghi Chetty Strret
Chennai 600 001
2. Gujarat Machine Tools
New No.279, Linghi Chetty Street
Chennai 600 001

3. Premier Machine Tools
New No.103 Armenian Street
Chennai 600 001
4. Machine Centre
New No.214 linghi chetty Street
Chennai 600 001

LIST OF RAW MATERIAL SUPPLIERS

1. Sai Steel Centre
28-A, Mooker Nallamuthu Street
Chennai-600 001
2. Mahavir Industrial Corporation
New No.273, Linghi Chetty Street
Chennai-600 001
3. Bhagawandas Metals Ltd
No.54 Sembudoss street
Chennai-600 001
4. Southern Iron and Steel company ltd
No.7.Wallace garden Second Street
Chennai-600 006
5. P.K.Vaduvammal
97,Rasappa Chetty Street
Chennai-600 003

FINANCIAL ASPECTS

1. COST OF PROJECT

[Rs.lakhs]

Land & Building (Advance)	0.20
Plant & Machinery	0.64
Other Misc. assets	0.03
Pre-Operative expenses	0.05
Margin for WC	0.10
	<hr/>
	1.02
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2. MEANS OF FINANCE

Capital	0.54
Term Loan	0.48
	<u>1.02</u>

3. COST OF PRODUCTION & PROFITABILITY STATEMENT

	[Rs.lakhs]				
Years	1	2	3	4	5
Installed Capacity Kgs	60	60	60	60	60
Utilisation	60%	70%	80%	80%	80%
Production/Sales Kgs	36	42	48	48	48
Selling Price	Rs.25,000 per Biogas Plant				
Sales Value (Rs.lakhs)	9.00	10.50	12.00	12.00	12.00
Raw Materials	4.69	5.47	6.25	6.25	6.25
Packing Materials	0.00	0.00	0.00	0.00	0.00
Power	0.51	0.60	0.68	0.68	0.68
Wages & Salaries	1.66	1.69	1.72	1.76	1.79
Repairs & Maintenance	0.06	0.07	0.08	0.09	0.10
Depreciation	0.16	0.12	0.09	0.07	0.05
Cost of Production	<u>7.08</u>	<u>7.94</u>	<u>8.82</u>	<u>8.85</u>	<u>8.88</u>
Selling, Admin, & General exp	0.96	1.01	1.06	1.11	1.17
Interest on Term Loan	0.05	0.04	0.03	0.03	0.03
Interest on Working Capital	0.02	0.02	0.02	0.02	0.02
Total	<u>8.11</u>	<u>9.01</u>	<u>9.93</u>	<u>10.01</u>	<u>10.10</u>
Profit Before Tax	0.90	1.49	2.07	1.99	1.90
Provision for tax	0.00	0.45	0.62	0.60	0.57
Profit After Tax	0.90	1.04	1.45	1.39	1.33
Add:	0.16	0.12	0.09	0.07	0.05
Depreciation					
Cash Accruals	1.06	1.16	1.54	1.46	1.39

Repayment of Term Loan	0.00	0.12	0.12	0.12	0.12
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4. WORKING CAPITAL:

	Months Consumptions	Values	%	Margin Amount	Bank Finance
Raw Materials	0.50	0.20	25%	0.05	0.15
Expenses	1.00	0.05	100%	0.05	0.00
		<u>0.25</u>		<u>0.10</u>	<u>0.15</u>

6. PROFITABILITY RATIOS BASED ON 80% UTILISATION

$$\frac{\text{Profit after Tax}}{\text{Sales}} = \frac{1.45}{12.00} \quad 12\%$$

$$\frac{\text{Profit before Interest and Tax}}{\text{Total Investment}} = \frac{2.12}{1.17} \quad 181\%$$

$$\frac{\text{Profit after Tax}}{\text{Promoters Capital}} = \frac{1.45}{0.54} \quad 268\%$$

7. BREAK EVEN LEVEL

Fixed Cost (FC):

	[Rs.lakhs]
Wages & Salaries	1.72
Repairs & Maintenance	0.08
Depreciation	0.09
Admin. & General expenses	1.06
Interest on TL	0.03
	<u>2.98</u>
Profit Before Tax (P)	2.07

$$\text{BEL} = \frac{\text{FC}}{\text{FC} + \text{P}} \times 100 = \frac{2.98}{5.05} \times 100 = 59.21\%$$

47% of installed capacity