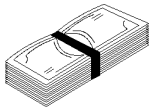

।। ओम् क्लेशकर्मविपाक आशयैः अपरामृष्टः पुरुषविशेष ईश्वरः।।

Project Report for PPP

Project Cost Rs.234 Lakhs

Bank TL 135 Lakhs & CC 27 Lakhs

Margin 72 Lakhs

Pyrolysis Oil production from waste plastic

Details of Factory : Land & Factory Building
at Gat no. 830, Mauje Renapur, Tq., Dist. Latur

Name of Owner : **M/s. U VIP(Uttap Vichhedan Industrial Project)**

Eco-Friendly Green Energy
U VIP
Uttap Vichhedan Industrial Project

Name of Consultant : **S.M.Parchure**

BEcivil, LLB, MIBM, DPH(I), MIE, MIWWA, MIAWPC,
FIV, MDSTA, MDCI, MBAI, MIRC, MICA, MIS, MICC, AMISA.
Engg., Archi., Management, Pollution Control Consultants,
Govt. approved Valuers/Arbitrators, Licensed Surveyor/Loss assessors.

CHARTERED ENGINEERS No.21420 ,
MANAGEMENT CONSULTANTS No.MIBM-7032 &enlisted by **"IDBI"**
ENROLLED ARCHITECTS No.151byMRSSKS Ltd. Mumbai,& No.3532 dt.15/9/90by MSAMB, Pune.
POLLUTION CONTROL CONSULTANTS by MPCB, Mumbai /1563 Dt.8/9/83 & KSPCB/AE-6/536 Dt.17/4/86, Bangalore.
Govt. Approved VALUER by CBDT, New Delhi No.CAT/I-2536 of 73 (IT,WT) & 1046 of 75 (ED Act) & by CC of IT, Pune-CAT/I-238 of 88 vide letter dated 9/9/92 &enlisted by **"IDBI"**
LICENSED SURVEYORS/LOSS ASSESSORS No.SLA-49253/94-99/EXPO 6/11/99 by (Min. of Fin.) Govt. of India, Delhi.
Member of International Council of Consultants-no.83/FEL/ICC vide L.no.72/MB2/ICC dt.07/02/1996
MEMBER-INDIAN COUNCIL of ARBITRATION , Delhi, No. MICA-1219 w.e.f. 6/12/94& FICA wef . 9/9/95

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Vinod Kadam (Pune):- 9922052060
Anup Yerte (Latur):- 7887911913, 8390906716
VALUER

Index

1.00 Introduction :-

The proposed unit shall be for production of LDO/FO from Pyrolysis Plant and allied products in due course. It is environmental friendly green pretty an activity that is need of the time and a step forward in Swatchha Bharat Abhiyan.

We intend to produce from (municipal) plastic waste, the pyrolysis oil i.e. LDO-Light diesel oil or FO-Furnace oil, Charcoal. This is easily saleable in market and saves foreign exchange. Gas is also produced but that is recycled and used for heating process.

The proposed unit shall be run by a Pvt. Ltd. Company enjoying groups of experienced associates, expert professionals, modern machinery and all necessary infrastructures etc complete.

The unit will be situated in almost 1.5 acres of land at Gat no. 830, in Mauje Renapur almost 15kms from Latur just 300 m. off on Latur-Aurangabad highway and situated on all seasonable road.

Finished goods may be dispatched by road.

Latur is industrially, commercially & educationally developed city.

Recently lot of development activity has been taken up at rapid pace since Latur city enjoys corporation status.

Daily almost 10 Tons of waste plastic gets collected out of municipal waste collection. We are assured supply of 6Ton/day of sorted good quality of waste plastic in the 1st stage. Thus raw materials are easily available for our project.

Finished goods shall be almost 2.1 Tons/day of LDO, 0.6TPD FO, plus 1.8TPD of charcoal. The gas produced shall be recycled for heating process in the plant. LDO/FO and charcoal can be easily sold in market.

Thus the entire picture is very stimulating

2.00 PERSONAL INFORMATION: The proposed unit will be run by a Pvt. Ltd. Company viz. UVIP Pvt. Ltd. and the details of the Directors, Associates & Professionals is appended herewith and marked as Ann. 1

2.02 Experience: - It is mentioned in Ann.1 itself

3.00 Market survey:- A list of purchasers of finished products is appended herewith

4.00 PRODUCT MIX AND APPLICATION:-

The major product to be manufactured by the unit is as under:-

LDO/FO & Charcoal produced are commensurate to standards fixed by Petroleum ministry.

The major application of the manufactured products is consumed by farmers for their FO operated engines, Foundries, Boiler run industries and alike.

5.00 MANUFACTURING PROCESS:

Raw material is daily collected, sorted, transported, shredding & agglomeration done by machine, and then processed through Automatic Pyrolysis Plant. Testing is done in laboratory to check % of goods produced commensurate to standards fixed by Petroleum ministry.

The word 'PYROLYSIS' is evolved from Greek-derived elements pyro "fire" & lysis "separating". Thermal cracking, or pyrolysis, involves the degradation of the polymeric materials by heating in the absence of oxygen. The process is usually conducted at the temperatures between 300-450^{o}C & results in the formation of a carbonized char & a volatile fraction that may be separated into condensable hydrocarbon oil & non-condensable high calorific value gas. The proportion of each fraction & their precise composition depends primarily on the nature of the plastic waste but also on process conditions.

We provide an indigenously designed and developed technology for recycling of waste plastic & convert it to useful hydrocarbon which can be used as industrial fuel. We provide pyrolysis plants in the range of 6 TPD processing capacity per day.

The pyrolysis process is batch type conversion.

Duration of batch process – 6 to 8 Hours.

Pyrolysis oil is further processed by distillation to get LDO-Light diesel oil and some part as FO-Furnace oil. The unique features of the plant are except for startup process the non-condensable hydrocarbon gas which is by product of the pyrolysis process is used as captive fuel to complete entire pyrolysis.

Features :

Sturdy construction

Material of construction - BQ steel or SS

Extremely Cost-effective

Very good profitable business

Eco friendly

The typical yield of waste plastic catalytic pyrolysis are:

A. Pyrolysis oil : 40 % – 60% from which after distillation LDO almost 35% and FO almost 10%

B. Hydrocarbon gas: 30 % – 20 %

C. Carbon Black : 30 % – 20 %

The description of various products & technologies are given below

The process is automatic, very simple and not much technical knowledge is required.

Unit proposes to purchase brand new machinery from standard company enjoying profound experience.

Suppliers of the machinery are well known and have successfully commissioned various similar units all over MP & in India.

Everything is visible after viewing the contents from presentation attached herewith

http://www.oorjasyscon.com/pyrolysis.html view presentation

Please see the video below.

https://www.youtube.com/watch?v=wCWLJQfnoks

https://www.youtube.com/watch?v=LSBQf7B3Z0c

6.00 INFRASTRUCTURE :

6.01 LOCATION :-

The proposed Unit will be located at Gat no.830, in Mauje Renapur near Latur and enjoys all the locational advantages required for the proposed unit.

6.02 Raw Material:

The Raw material required is municipal waste plastic. It is daily & easily available in ample quantity.

6.03 Power:

Power required is almost 19 Kw. Ultramodern SPS-Solar Power System to cater for this need is proposed to be set up by this unit.

6.04 Man Power Requirement:-

The required skilled and unskilled labor force is available at Latur along with machine operators, persons for office work, accounts and administration as under:-

1 Technical Engineer (Part time), 1 persons- Administrative-accounts-stores-clerical etc., 1 Supervisor, and 6 Unskilled Workers etc complete. =Total staff of 9 persons only.

6.05 Transportation:-

The raw materials and the finished goods are to be transported by roads.

We have proposed to engage 2 mini trucks/tractors with large trolleys for this project on the basis of immediate availing upon phone and rate of raw materials is presumed to be delivered to our factory site.

6.06 Effluents:

Absolutely 'No hazardous effluents' are generated during production process. The unit to submit application for MPCB clearance and shall seek FSSAI license etc

7.00 Financial Estimates:

The detailed cost of assets to be acquired and its estimates are as follow:-

A) Land : (Own belonging to Chairperson of Company)

B) Factory Building & Godown

C) Plant And Machinery:

D) SPS-Solar Power System:

E) Preliminary Expenses:

F) Other costs:

Total (A+B+C+D+E+F)

As quoted in financial statements attached herewith

8.00 Cost of Project :

Sr. No. Particulars

A) Fixed Assets

1. Land (Own enjoying FMV @165/sqmx1.5acrex4046.80=1 Cr.)
2. Factory Building
3. Plant & Machinery
4. SPS-Solar Power System
5. Preliminary & Pre-operative Expenses
6. Other Costs

As quoted in financial statements attached herewith

B) Working Capital

As quoted in financial statements attached herewith

9.00 Means of Finance :-

Sr. No. Particulars

1. Term Loan- Machinery & Building etc
2. CC limit against working capital
3. Unit own capital etc
4. Temporary loan (Int. free being arranged by directors of Unit)

As quoted in financial statements attached herewith

CC is required 3 months equivalent to basic expenses per month as initial run because raw materials purchased by hard cash on principal of 'Kata & Nota', 3 days needed to bring in raw materials up to factory duly shredded and agglomerated, 2 days for feeding to machinery, 45 days needed in saleable LDO/FO purchasers to pay against invoices, 3 days to deliver LDO/FO to customers, 30 days payment site given to customer to receive payment to bank account of manufacturer, 7 days for bank transaction realization and withdrawal for next works and to account for lag period of non-working days, thus in all 90 days period is locked hence CC is needed for 90 days i.e. 3 months period.

Owing to this 90 days lag is expected to receive income in hand. Hence in financial calculations in 1st year income is expected to be in hand @3/4 instead of 1 year and expenses are estimated @100%. This affects cash flow and so considered aptly in financial calculations.

In order to keep envisaged projected financial calculations intact, it is proposed to start yearly increment in capacity utilization 90 days earlier for each subsequent year so that projected income gets realized in each next year commensurate to projected cash flow.

10. Profitability Analysis :-

As quoted in financial statements attached herewith

Please see annexures hereinafter enclosed for ready reference please.

In Next stage we propose to consider Solar based transport vehicles, T2T (Toilet water to Tap water) plant, etc

11.00 CONCLUSION :-

Profitability analysis shows a net sufficient 'Income' which increase tremendously in subsequent year. Sales and Production Expenses are estimated on conservative basis.

Cash accruals are sufficient for repayment obligations and drawings.

Entire output will be consumed by demand in market.

I, therefore see every chance for my proposed unit to succeed. I am confident.

For : M/s. U-VIP, Latur

Important points

1. **Objects of the Project**

   Captioned project is related to environmental friendly industrial activity, to manufacture LDO/FO from waste plastic needed for use in foundries, LDO/FO based engines, boiler heaters, and in turn advantageous to Swatchha Bharat Abhiyan welcomed by public at large. Thus it is a noble cause and a need of the hour.

2. **Land**

   Proposed location of **U VIP**- Utpat Vichhedan Industrial Project is at Gat no.830, Mauje Renapur almost 15kms from Latur situated on all seasonable roads convenient to procure arrangements of raw materials and dispose of finished goods preferably in local market. Basic amenities like unskilled labor, water, and other components needed for the project are easily available nearby. Considering limits indicated in Project calculations land is sufficient for the need of the project.

3. **Entrepreneur**

   The Entrepreneur is a Pvt. Ltd. Company having its directors to be highly enthusiastic resourceful persons. They hail from a farmer's family closely related business activities. Owing to their credentials along with their experienced team of professionals they are capable to successfully handle this Industrial project. They have incurred fruitful activities concerned with farmers, agro works, social, political, cultural, accomplishments and hence their decision now to commence captioned project is in the interests of citizens of Latur, workers, consultants, and human beings.

   The Entrepreneur has carefully crafted project report with the help from expert consultants and skill sets needed for the project.

4. **Men and Machinery**

   Necessary resource persons, consultants, environmental experts, CA, Electro-mechanical engineer, mechanic, skilled and unskilled labor, marketing youthful zealous associates are arranged to help for the project.

   Result oriented Automatic Machinery like Pyrolysis Plant capacity 6Ton/day, shredder & agglomeration unit to process waste plastic, Inclined conveyors & belts, Loading & Unloading platform & piping, Conveyor belts, electronic gadgets & controllers, tolls and equipments etc complete is being procured from experienced machinery supplier on Turn "Key basis"

   19 kw SPS- Solar power system is being procured to handle electrical and lighting load with net-metering to MSEDCL so as to run the plant on its own in competitive costs.

   This is proposed to be installed 110% of requirement considering annual depletion of power generated by SPS in subsequent period. The proposed SPS of 19 kw can be accommodated in costs as envisaged in the project cost suiting to quotes in hand.

6 unskilled labor @Rs.9,750/m i.e. Rs.1.17 lac/yr shall be engaged costing Rs.7.02 lacs + 2 semi-skilled labor @Rs.11,125/m i.e. Rs.1.335 lac/yr shall be engaged costing Rs.2.67 lacs and 1 part time mechanic cum maintenance engineer shall be appointed costing Rs. 1.04 lacs/yr i.e. in all salary to staff shall be Rs.10.73 lacs/yr and considering leave days replacements etc Rs.4800/day is direct labor cost that is contemplated in financial calculations duly providing minimum wages to them under prevalent Act.

5. Tools & equipments, gadgets

Necessary electronic sensors, tools and equipments and various gadgets are being procured to efficiently run all machineries almost on auto driven and self-controlled state so as to economize on running costs and repairs and maintenance. This is expected to be developed indigenously by advanced skill sets of young engineers. This can be accommodated in cash flow available to entrepreneur during progress of works.

6. Civil works

Factory shed of 50' wide, 100' long, 25' height is proposed to be erected by simple Tin roofing with partial Tin cladding that can be easily and quickly erected. This is proposed to be constructed @ Cost as envisaged in project report. All proposed machinery can be accommodated in this factory shed suitable to handle work for all seasons.

Other shed of 50' wide, 60' long, 18' height is proposed to be erected by simple Tin roofing with Tin cladding that can be easily and quickly erected. In the godown waste plastic can be stored for pre-treatment. MS racks may be provided to stock bags of goods, and a section may be provided to stock catalyst, spares, and other components etc.

Insurance cost and office expenses etc can be accommodated in other costs of as envisaged in project report.

7. Manufacturing process- raw materials, processing, finished goods & its utility

Raw materials comprise of waste plastic. Unit has contacted about assured supply of 6 TPD of waste plastic. MoU with supplier of raw material is being executed.

Cost of raw materials of presumed @Rs.8/kg in project report is Ok

Raw material is daily/weekly collected, sorted, transported, shredded & agglomeration done by machine, and procured to process for finished goods. Testing is done in laboratory to check % of standards stipulated by Petroleum ministry.

The raw materials are processed in automatic Pyrolysis Plant and final goods are sold in market. The process is automatic, very simple and not much technical knowledge is required. Unit proposes to purchase brand new machinery from standard company.

Suppliers of the machinery are well known and have successfully commissioned various similar units all over MP & in India.

Finished goods are sold in local market suitable for Generator sets, Pump sets, Foundries, Tractors/Old trucks, JCB, and heavy duty machineries etc

8. Market

Proposed project unit desires to produce 2.1Ton of LDO, 0.60 TPD of FO and 1.8TPD of Charcoal as shown in project report. All items are easily saleable in market. MoU with customers are done to consume entire production.

However good marketing young team with qualifications like MBA, BBA is proposed to be engaged on commission basis capable to handle demand in the market.

Industry is having own web site www.uvip.in capable to book purchase orders online and can suitably handle social platforms like twitter, whatsapp, instagram etc. to enjoy connectivity with prospective consumers in the market.

9. Money

Entrepreneur is ready to provide margin of Rs.72 Lakhs

Bankers support is needed as Term loan of Rs.135 Lakhs against machinery and fixed assets @soft rate of RoI 12% with CC limit of Rs. 27 lakhs @soft rate of RoI 10%

CC needed for 3 months period as explained herein before

Taking in view long term customer relationship with banker, present market conditions, priorities of Govt. policy to support such Industry, uniqueness & specialties of the Unit, proprietor's background, thorough approach in framing project report for the captioned project and such other parameters, we are confident that Money shall not be problem to go ahead with this project.

10. Management

Management of the project is to be steered by expert professionals as afore referred and that is sure to lead towards GOAL

11. Limits revealed by Project report

BEP- Breakeven point is calculated and shows positive depiction. All details are so carefully crafted and astutely considered with pre-thinking that the unit is expected to lead to success.

Sensitivity analysis indicates that in case sale price is decreased by 20% and at the same time production is decreased by 20% the unit is likely to face little loss else sure to win.

Calculations of all components shall have to be ensured within limits as proposed in basic info considered in the project report

12. Registrations , permits & licenses

In hand- PAN:- , Bank details Ac No. , IFSC:

To be taken - NOC from Gram-panchayat for the unit, SSI Registration, Petro. registration , GST registration , registration in MSME mart, MPCB clearance, Copy rights for Logo (to use in Letter head & Publicity materials), Web site development and marketing App, MSEDCL net metering, and such other allied works

13. Bye products, R&D, Specialty

Bye product in the unit shall be gas i.e. proposed to be used in heating process.

R&D-Research and development is expected to be done so as to assure better quality of production with enhanced parameters as well so as to ensure efficiency, economy and elegance.

Specialty- 1. Specialty of the proposed unit is to use sorted waste plastic to produce Pyrolysis Oil /LDO/FO & Charcoal. This is to add to improved value aimed to give solace to Indian economy.

2. The LDO/PO/FO produced as aforesaid and proposed to be sold in market to ensure better yield and shall prove to be a feather in cap.

3. Green Project- This is eco-friendly unit and a green project as no emissions or effluents disastrous to environment are produced. On the contrary disadvantage to environment is eradicated. Hence this is considered as a **Priority Project**.

4. Calamity – If at all unit faces any unforeseen calamity e.g. recent Lockdown in India due to covid-19, the unit is sure to sustain such shocks from surplus in hand that are being generated in each year as profitability enjoys sufficient cushion to face such difficulties at ease.

5. Waste to Wealth- Project is to produce wealth from waste,

6. Project is a Step to Swatchh Bharat Abhiyan

14. Seasonal restrictions, other points

Seasonal restrictions- Captioned unit can be run in all seasons devoid of seasonal restrictions.

Other points- These are narrated at length in project report.

15. Fate i.e. X factor

As rightly said by management guru Dr. Henri Fayol in year 2015 in spite of observing principles of management there is some X factor viz. fate that also plays important role in management of business activity.

Lord Shrikrishna in Shrimad Bhagwad Gita Chapter 18 shlok 14 has said

अधिष्ठानम् तथा कर्ता करणम् पृथक् विधम्। विविधाश्च पृथक् चेष्टा दैवम् चैवाच पंचमम्।। This means that 1. land, 2.Entrepreneur, 3.Various means like men & machinery, 4.Various manufacturing process and 5.Fate are 5 factors for any work/activity/business etc.

In case of captioned project we take care of 4 factors and leave the 5th one to destiny.

However fate is governed by earlier works done by Entrepreneur and social noble cause for which we intend to work and then Almighty also helps to lead the project to MAGNIFICENT ACCOMPLISHMENT

16. Other specialties

Environmental project - This is Environmental Eco friendly project advantageous to environment and comes under priority

Green Project – This is eco-friendly Green Project devoid of any toxic elements or effluents, using own energy, soothing to environmental norms, and enjoying "carbon Credits"

In turn Benefits to human beings

It needs minimum water, labor, expenses and produces constructive results

Solar power center, A very large sized solar power center is provided to cater energy need of all kinds machinery and lighting need, care shall be taken to revive

Water cycle, water pumps and machinery shall be fitted with auto sensors to ensure appropriate minimum consumption, economical use, proper utilization, waste management & water recirculation, rain water harvesting, green revolution works, horticulture, gardening & landscaping, water filtration plant, fountain, drainage & waste water recycling units, open spaces etc complete, care shall be taken to maintain

Internal roads, street lights, CD works, main gate, compound, security cabins, smart appliances, CCTV bullet cam with NVR, fire alarm system and firefighting arrangements, intercom, 24x7 internet, wi-fi, dish net, infrared gadgets, RFID tags, LED display towers, neon lights, energy audit facility, automation works, video door phone, various types of ultra-modern and beautification devices, quick transportation system by road, rail and road connectivity, etc complete

17. Advantages

Nonviolent atmosphere

Clean pure air

Decent climate

In Marathwada region for the 1st time of its kind

Vicinity of real consumers

Sufficient water, energy, and all basic civic amenities

High growth rate

Job opportunities

Quick connectivity

Smart gadgets including auto sensors etc

18. SWOT analysis

SWOT – Strength, Weakness, Opportunities, Threats

Strength - Acumen, Profound Experience, background,
Support of experts
Financial capabilities
Economic viability
Other specialties

Weakness - New Concept unfamiliar to Marathwada region
Like Air purifiers/sanitizers etc still not become popular being new

Opportunities- Latest concept already established in MP/Gujrath
It is sure to WIN
We are to lead due to inherent merits

Threats- To sustain interest burden during execution till realization
Incur more sales promotion expenses
Lack of consumer information

Marks Obtained under SWOT

S- 90/100,
W- 60/100,
O- 75/100,
T- 45/100 i.e. in all 270/400 hence safe

5W&1H

What- This is UVIP- Utpat Vichhedan Industrial Project
When- Immediate in Yr. 2020
Where- At Gat No.830, Mauje Renapur, Tq. & Dist. Latur
Who- Chief promoter & capable entrepreneur
Why- It is the need of hour & an appealing opportunity
&
How- By help from experts & professionals with clear thinking on project

Financial statements for 5 years including

1. Cost of Project
2. Means of finance
3. Schedule of Depreciation
4. Capacity Utilization
5. Year wise income and expenses
6. Selling & distribution expenses
7. Cash flow statements
8. Projected balance sheets
9. Profitability analysis
10. Debt-Service coverage ratio
11. Other relevant Ratios
12. Graphs etc …… attached herewith separately

List of Important Documents attached with this project report----

Sr.No.	Particulars
1.	Pvt. Ltd. Co. Registration
2.	PAN
3.	SSI Registration
4.	FSSAI registration
5.	MPCB clearance
6.	Grant of Lease of land & annual rent fixing
7.	NOC from Gram-panchayat for the lease of land
8.	Bank details
9.	List of Technical persons with their CV
10.	Quotation of machinery & Machinery Photo
11.	Estimates of civil works
12.	Bio-data of Proprietor
13.	CV of Consultants
14.	CV of Professionals
15.	Photo attested of all above
16.	Logo, Letter head, Publicity materials
17.	Web site development and marketing app
18.	All allied works

Please see next

Pyrolysis Info

Pyrolysis = उत्ताप विच्छेदन

Pyrolysis is the thermal decomposition of materials at elevated temperatures in an inert atmosphere.[1] It involves a change of chemical composition. The word is coined from the Greek-derived elements *pyro* "fire" and *lysis* "separating".

Pyrolysis is most commonly used in the treatment of organic materials. It is one of the processes involved in charring wood.[2] In general, pyrolysis of organic substances produces volatile products and leaves a solid residue enriched in carbon, char. Extreme pyrolysis, which leaves mostly carbon as the residue, is called carbonization. Pyrolysis is considered as the first step in the processes of gasification or combustion.[3][4]

The process is used heavily in the chemical industry, for example, to produce ethylene, many forms of carbon, and other chemicals from petroleum, coal, and even wood, to produce coke from coal. Aspirational applications of pyrolysis would convert biomass into syngas and biochar, waste plastics back into usable oil, or waste into safely disposable substances.

Pyrolysis generally consists in heating the material above its decomposition temperature, breaking chemical bonds in its molecules. The fragments usually become smaller molecules, but may combine to produce residues with larger molecular mass, even amorphous covalent solids.

In many settings, some amounts of oxygen, water, or other substances may be present, so that combustion, hydrolysis, or other chemical processes may occur besides pyrolysis proper. Sometimes those chemical are added intentionally, as in the burning of firewood, in the traditional manufacture of charcoal, and in the steam cracking of crude oil.

Conversely, the starting material may be heated in a vacuum or in an inert atmosphere to avoid adverse chemical reactions. Pyrolysis in a vacuum also lowers the boiling point of the byproducts, improving their recovery.

When organic matter is heated at increasing temperatures in open containers, the following processes generally occur, in successive or overlapping stages:

Pyrolysis is the basis of several methods for producing fuel from biomass, i.e. lignocellulosic biomass.[20] Crops studied as biomass feedstock for pyrolysis include native North American prairie grasses such as *switchgrass* and bred versions of other grasses such as *Miscantheus giganteus*. Other sources of organic matter as feedstock for pyrolysis include greenwaste, sawdust, waste wood, leaves, vegetables, nut shells, straw, cotton trash, rice hulls, and orange peels.[3] Animal waste including poultry

litter, dairy manure, and potentially other manures are also under evaluation. Some industrial byproducts are also suitable feedstock including paper sludge, distillers grain,[21] and sewage sludge.[22] **Pyrolysis can also be used to treat municipal solid waste and plastic waste**.[4][10][32] The main advantage is the reduction in volume of the waste. In principle, pyrolysis will regenerate the monomers (precursors) to the polymers that are treated, but in practice the process is neither a clean nor an economically competitive source of monomers.

"Interactions of three municipal solid waste components during co-pyrolysis".

Pyrolysis is the sustainable management of **plastic waste** along with production of **liquid** oil as a source of energy and solid char and gases as value-added products. This **process** involves thermal degradation of complex molecules or large chain hydrocarbons into smaller molecules or shorter chain hydrocarbons.

Plastics waste may grow in India in future because more and other countries like as U.S, China and U.K will comes in Indian market. There is a much wider scope for recycling in developing countries mainly in India due to low labor cost, plastics consumption increase and therefore raw materials increase.

Plastics are produced from petroleum derivatives and are composed primarily of hydrocarbons but also contain additives such as antioxidants, colorants, and other stabilizers.

Table 3: Type of plastics and its content.

Type of plastics	contents
PE (HDPE, LDPE), PP, PS	hydro carbons
PET, PVA, PF	hydro carbons with oxygen
PVC, PVCD	hydrocarbons with chlorine
Nylon (polyamide), PU	hydrocarbons with nitrogen
Polyphenylene sulfide	hydrocarbons with sulfur

Catalytic Pyrolysis

Pyrolysis of waste plastics in presence of catalyst lower the pyrolysis temp and reaction time, increase conversion rate of waste plastics into fuel, increase the yield of fuel and satisfying diesel, petrol quality of fuel by increase octane value of petrol and decrease Recent Advances in Bioenergy Research Vol. III 2014

450 pour point of diesel. Catalyst use for this purpose is solid acids such as silica, alumina, zeoliteβ, zzeoliteY, mordenite, HZSM-5, MCM-41. Acidic catalysts (HZSM-5, Zeolitey, mordenite and so on) have greater efficiency than less acidic ones, for example amorphous alumina silicate.

The pore size and structure of catalyst determine their performance on cracking reaction as well as production, for example mordenite size(about 7x8Å) larger give large product molecules while HZSM-5 have smaller pore size(5x5Å) give small product molecules.(P.A. Parikh and Y.C. Rotliwala, 2008)
The average percentage yield of various fuel fractions by fraction distillation depending on composition of waste plastics are Gasoline (60%) and Diesel (30%). The percentage of liquid distillate is mentioned in terms of weight by volume (Antony Raja and Advaith Murali 2011).

Eco-friendly

The fuel satisfies quality of liquid fuel with low sulfur content and low carbon residue.
The properties of waste plastic pyrolysis oil and diesel as under
collection and segregation of plastic waste -→ storing of plastic waste -→ shredding of plastic waste -→ feeding into hopper-→Flow of waste into heating vessel in absence of oxygen and presence of catalyst -→ vessel tarry waste→movement of liquid-vapor into condenser -→-Tapping of liquid fuel → Fractionation of liquid fuel to obtain diesel, petrol, kerosene etc.
Recent Advances in Bioenergy Research Vol. III 2014

Feasibility

Process of conversion of waste plastics into liquid fuels is feasible. Also the rate of fuel does not vary widely along the period. The cost for per kg of input and related output in table 6 is below.
Table 6: cost for 1 kg of input and the yield, cost of output.

Input	Qty Kg	Rate per Kg	Amount (Rs)	Output	Qty (l)	Rate per liter	Amount (Rs)
Plastic	1.00	12.00	12.00	Petrol	0.600	37.50	22.50
Labour			5.00	Diesel	0.300	25.50	07.65
Service Charge			2.50	Lube oil	0.100	15.00	01.50
Total	1.00		19.50		1.00		**31.65**

(Antony Raja and Advaith Murali, 2011)

Good performance

Liquid fuels from petroleum is diesel, petrol, kerosene require to mix various additives for improving burner and engine performance but fuel from waste plastics does not require to add these additives for work on burner and engines. Tarry waste or residue in reactor can use as solid fuel.

Conclusion and recommendation

Based on review papers, waste plastics liquid fuel is good alternative method for obtaining new energy resource and eliminate greater problem of plastics waste management.
In India 3.6 million ton of plastics waste generated in 2007. Improper management of plastics gives hazardous problem to human and environment. Mechanical recycling is not effective to reduce to problem of plastics waste. Incineration, gasification, blast furnace is other method does not effectively eliminate to this problem due to air pollution, economical unfeasibility compare to waste plastics fuel method. Biodegradable plastics are not meet at same rate as petroleum based plastics.

Growth of energy demand due to urbanization, population, industrialization and also increased price of fuel need to reduce to this demand and increased rate of fuel. Waste plastics fuel is eco-friendly due to low content of pollutants, good performance characteristics on engine, burner with no added any additives like as lubricants and good feasibility with earning profit.

The worldwide plastic generation expanded over years because of the variety applications of plastics in numerous sectors that caused the accumulation of plastic waste in the landfill. The growing of plastics demand definitely affected the petroleum resources availability as non-renewable fossil fuel since plastics were the petroleum-based material. A few options that have been considered for plastic waste management were recycling and energy recovery technique. Nevertheless, several obstacles of recycling technique such as the needs of sorting process that was labour intensive and water pollution that lessened the process sustainability. As a result, the plastic waste conversion into energy was developed through innovation advancement and extensive research. Since plastics were part of petroleum, the oil produced through the pyrolysis process was said to have high calorific value that could be used as an alternative fuel. This paper reviewed the thermal and catalytic degradation of plastics through pyrolysis process and the key factors that affected the final end product, for instance, oil, gaseous and char. Additionally, the liquid fuel properties and a discussion on several perspectives regarding the optimization of the liquid oil yield for every plastic were also included in this paper.

Pyrolysis of plastic waste for liquid fuel production as prospective energy resource

Typical flow diagram -→

Reactor-→Receiver -→Catalytic Tower -→Distillation Column-→Condenser-→Oil Gas separation Tower -→ Gas scrubber-→ Anti flash back device-→ Storage tank-→ Exhaust scrubber-→Stack-→ Control Panel

Reactor:

The reactor is the heart of our pyrolysis system. It consists of a reaction vessel and a furnace which is insulated on the outside with ceramic wool and cladded with Aluminum/ mild steel sheet. The heating system consists of an oil purification unit, oil pumping unit and mono block burners.

The reactor is fed with raw material manually and our proprietary catalyst mixed in a certain proportion. The furnace is heated so that the temperature inside the reactor is in a temperature range where catalytic decomposition takes place depending on various feed stocks. The material is continuously agitated by the rotation of the reactor. The reactor also has the provision for nitrogen purging to create inert environment to allow the process to happen in the absence of oxygen.

Gas Receiver:

The syngas from the catalytic degradation comes out of the reactor and is cleaned using a receiver where the heavier carbon particles and long chain hydrocarbons condense and flow back to the reactor due the unique reflux and the lighter fraction is taken to the multi-layer catalytic tower. The syngas velocity also decreases in the cyclone due to which the gas gets more residence time in the catalytic tower and subsequent line.

Catalytic Tower:

The catalytic tower is used to purify the syngas using catalyst in the vapour phase. We can remove unwanted components like H2S, SOX, NOX etc. using appropriate catalyst.

Condensers:

Shell and tube condensers are used to cool the syngas from the reactor to liquid Petro Alternate Fuel.

Anti-Flashback Device:

The uncondensed clean gas is then passed through a tank that is partially filled with water. The gas bubbles out to the next line of components. The water ensures that the gas that bubbles out cannot go back to the previous line of components.

Mode of Heating:

Our plant is equipped with automatic Mono bloc burners specially designed to work with pyrolysis oil. Partial heating is also done by designed to work with pyrolysis oil. Partial heating is also done by utilizing the incondensable gases.

Storage Tank:

The Petro Alternate Fuel (PAF)is stored in the storage tank.

Scrubber: The gas and oil after getting fired in the furnace is cleaned by passing it through a wet alkali packed bed scrubber. The flue gas is cleaned, cooled and filtered to remove the particulate matter from the flue gas.

Chimney:

The cooled flue gas is then vented to the atmosphere through the chimney.

Flaring System:

It is dangerous to vent exhaust gas (C1 to C4) without any safety measures. In our process, it is transferred first through the safety device and then burnt in the burner or Flare system.

Control panel:

It is used to control the entire machine

Cycle Time

Description & Time in Hrs	
Feeding	3-4
Heating	12-20
Cooling	6
Carbon Removal	2

Environment Friendly Process:

1. Wet Scrubber system ensures absolutely no black smoke from the stack.
2. The extra incondensable gas will be recycled for heating reactor and hence no gas pollution.
3. Every junction of the reactor is in good sealing situation with professional sealing material.

Value Proposition

1. Reduce Plastic / Tyre waste pollution
2. Get tipping fees associated with Plastic / Tyre sourcing.
3. Reduce greenhouse gas emissions (GHG emissions) related to incineration and oil extraction.
4. Reduce dependency on foreign oil and exposure to volatile oil prices.
5. Create additional revenue through mixed fuel sales from waste.
6. Create green jobs for local community
7. Create strong environmental stewardship with local community by better waste management practice.

Typical Properties of Petro Alternate Fuel (PAF)

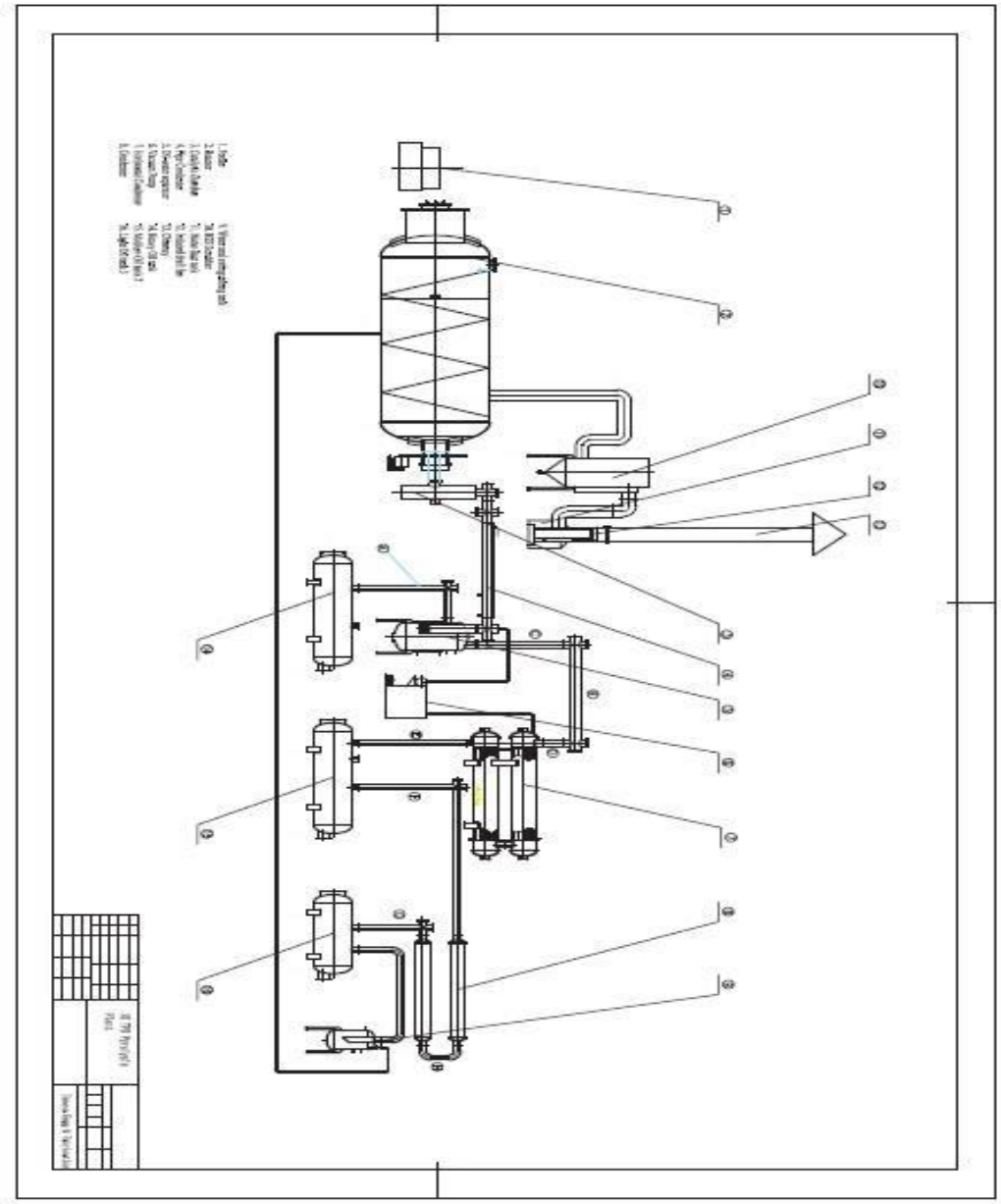
Fuel Property	Petro Alternate Fuel (PAF)	Diesel (ASTM)
Density @ 15°C g/cm3	0.78-0.9	0.82
Kinematic viscosity @ 50°C cStoke	1.79	2.5
Water Content %(v/v)	0.1	0.1
Ash % (m/m)	0.05	<0.01
Sulphur Content %	0-0.35	0.15-0.30
Carbo Residue %	<0.5	0-0.5
Cleaveland Flash Point °C	<72	52-96
Gross Calorific Value Kcal/Kg	10000-11000	10800

Technical parameters

1	Equipment type	IE-5
2	Raw material	Tires/Plastic
3	Structural form	Horizontal rotation
4	24-hour Capacity	3-4 ton
5	Oil yield	1.5-1.8 ton
6	Operating pressure	Normal
7	Material of Reactor	516 Gr 70
8	Thickness of Reactor	10mm
9	Rotate speed of Reactor	0.8turn/minute
10	Total power	35KW
11	Mode of cooling	Water cooling
12	Cooling area of condenser	50sqm

13	Kind of transmission	Gear drive
14	Noise dB(A)	≤85
15	Size of Reactor(D×L)	2000×6000
16	Working form	Intermittent operation
17	Delivery time	12 weeks

Typical general arrangements



Pyrolysis Process & Machinery Photo 1

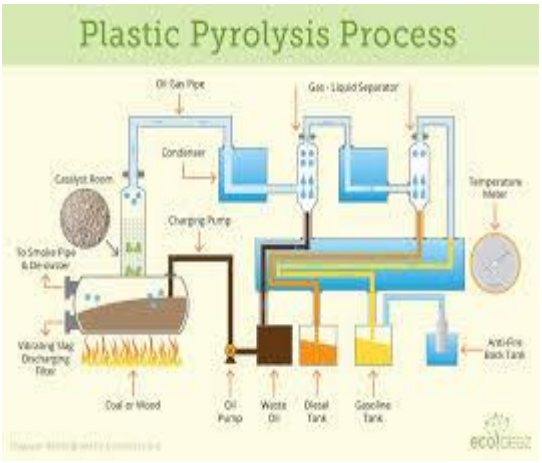
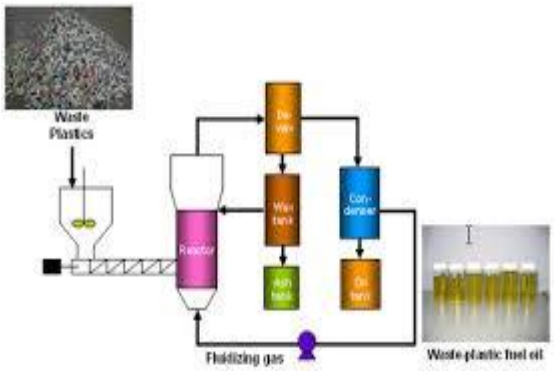


Photo2



Process of Pyrolysis of Waste Plastics Technology

Photo 3

Photo 4

Photo 5

Photo 6

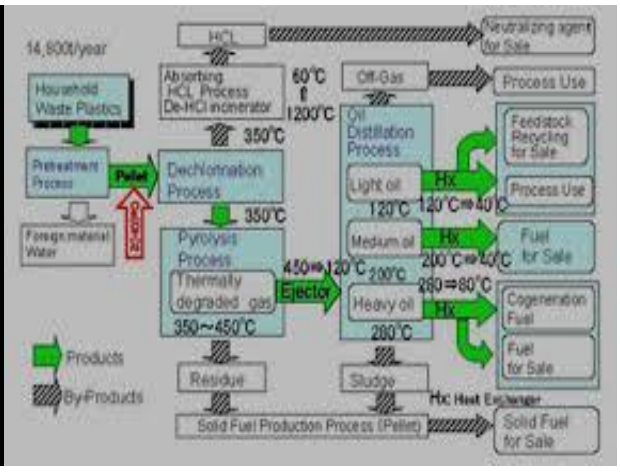


Photo 7

Photo 8

Photo 9

Test Certificate for Product

LOCATION:	BARODA	SAMPLE BY:	Client
SAMPLE TYPE:	As submitted	DATE SAMPLED:	Not available
	TC684219000014886P		
SAMPLE CONTAINER	PLASTIC BOTTLE		
SAMPLE QUANTITY	4LITER		

METHOD	PROPERTY	RESULT	UNITS
ASTM D1298-2012	Density at 15°C	888.3	kg/m³
ASTM D445-2017	Kinematic Viscosity at 40°C	1.802	cSt
*ASTM D92-2016B	*Cleveland Flash Point (Open cup)	<79	°C
*ASTM D92-2016B	*Cleveland Fire Point (Open cup)	<79	°C
ASTM D95-2013	Water Content	0.05	% (V/V)
ASTM D97-2017	Pour Point	21	°C
ASTM D4868-2017	Gross Calorific Value	10734	kcal/kg
ASTM D4868-2017	Net Calorific Value	10095	kcal/kg
ASTM D4294-2016e1	Total Sulfur Content	161	mg/kg
*ASTM D189-2014	*Conradson Carbon Residue	0.01	% (m/m)
*ASTM D482-2013	Ash from Petroleum Products Ash	0.016	% (m/m)
*ASTM D2386-2015	*Freezing Point	Not Possible Due to Dark Colour	°C
ASTM D664 (Method B)-2017	Acid Number	5.65	mg KOH/g
ASTM D473-2017	Sediment by Extraction	0.03	% (m/m)

lote : * Analyte is not under scope of NABL accreditation

End of Analytical Results

This laboratory is accredited under ISO/IEC 17025. The results reported herein have been performed in accordance with the laboratory's term accreditation except calibrations/tests marked with an asterisk (*) in this report which are not within the scope of accreditation for our laboratory

Result is outside of test method Limits and/or analytical range used in method precision study

This report relates specifically to the sample tested as received. All tests have been performed using the latest revision

Certificate of Analysis TO17-003462.001

PRODUCT DESCRIPTION: Pyrolysis Oil **CLIENT ID:** Not Mention on Bottle

As Supplied

SAMPLE TYPE: As submitted

SAMPLE RECEIVED:

LOCATION:

SAMPLE SOURCE:

Mumbai **SAMPLE ANALYSED:**

SOURCE ID:

SAMPLE BY: Client

DATE SAMPLED: Not available

11/07/2017

08/07/2017

SGS ORDER N° : 3004551

METHOD PROPERTY RESULT UNITS

ASTM D1298-2012 Density at 15°C 784.1 kg/m³

ASTM D93 (Procedure

B)-2016

Observed Flash Point <40 °C

ASTM D189-2014 Conradson Carbon Residue 0.17 % (m/m)

* ASTM D5453-2016 Sulfur Content 437 mg/kg

ASTM D4868-2017 Gross Calorific Value 11098 kcal/kg

End of Analytical Results

Purchasers of LDO/FO

Abhijeet Lubricants M-90217 86689

Panjarpol, Shahu Mill Road, Bagal Chowk, Kolhapur - 416002, Near Veershaiv Bank

Sameer Enterprises M-91528 33367

D Block 59/3, Gokul Shirgaon Midc, Kolhapur - 416234, Near Arvind Mill

Maruti Oil & Tyre sales M-98815 63575, 97657 88168

Gala No 1, Pune Banglor Highway Bridge, Uchagaon, Kolhapur - 416005, Near Hotel Rahi

Gajanan Automobiles M-87887 50421, 81494 49500

Shop No 01, Nivruti Chowk Road, Shivaji Peth, Kolhapur - 416012, Near Gandhi Maidan ,Beside Janata Bazaar

Konduskar Distributors M-98231 49914, 0231 2671086

Plot No P 70, Bus Stop Road, Gokul Shirgaon MIDC, Kolhapur - 416234, MIDC

Diamond Petroleum M-91523 90539

A 306, Arjun Centre, Govandi Station Road, Govandi East, Mumbai - 400088, Opposite Patvardhan Colony

Please look to news on this topic as under

Hema Malini inaugurates India's first plastic to diesel conversion plant in Mathura 2nd Oct 2019

India's first plastic to diesel conversion plant in Mathura was inaugurated by Hema Malini as she claimed that this plant will fulfill PM Narendra Modi's dream of a Swachh Bharat.

In probably the best tribute to Mahatma Gandhi on his birth anniversary on October 2, Mathura MP Hema Malini inaugurated the country's first plastic to diesel conversion plant in Mathura, Uttar Pradesh claiming that this plant will fulfill PM Narendra Modi's dream of a Swachh Bharat.

Notably, a model of this plant had been placed for a demonstration before PM Modi when he had arrived in Mathura some time back as a part of Swachh Bharat Abhiyan. This model is now working on a full scale at the Mathura Municipal Corporation's (MMC) trenching grounds.

Talking to India Today, Assistant City Commissioner of Mathura AK Singh said that this plant will eliminate the plastic waste from Mathura and it will be turned into more useful diesel which will then be used by the Mathura Municipal Corporation for its own garbage trucks. Also, the MMC has completely banned single-use plastics in the city limits.

AK Singh said, **"This plant will eliminate five metric tonne plastic every day from the city, converting it into diesel. Several hundred tonnes of plastic waste has already been accumulated at the trenching grounds by the municipal corporation and more will be collected in the days to come, so that this plant continues to work efficiently and without stopping."**

The assistant city commissioner of Mathura said that the plant will work on a public-private partnership (PPP) model for which the MMC has signed a contract with Paterson Energy.

Social activist Deep Sharma said that such a plant would have served its purpose better in Agra where the amount of plastic waste generated is much higher, being larger and more urbanised than Mathura. **"If established in Agra, this plant could have served as a model for other cities to emulate since Agra is an internationally known city and it catches better global attention than Mathura,"** Deep Sharma said.

Deep Sharma added that the organic wastes generated in Agra are being converted into manure. **"If the plastic waste could also be eliminated in an eco-friendly manner, Agra could soon lose the tag of one of the dirtiest cities in India,"** Deep Sharma said.

He appealed to the Agra Mayor Naveen Jain to make efforts to get a similar plastic to diesel conversion plant established in Agra.

For more information please contact S.M.Parchure M-8390906711/20/24

And please see financial statements attached herein after

Basic Info for PPP- Pyrolysis Production Project

Basic Info for PPP- waste plastic to LDO/FO manufacturing Industries

Capital Cost

No.	Machine	Qty	Rate	Amount
1	Plant & machinery Pyrolysis plant & Distillation plant with taxes	1	9,240,000	9,240,000
2	LDO & FO storage tanks with digital callibration pumps	1	150,000	150,000
3	Preliminary & Preoperative expenses	1	150,000	150,000
4	1 TPD muni. Plastic waste shredder	5	150,000	750,000
5	Agglomeration unit 1TPD	5	300,000	1,500,000
6	Total Machinery Cost including taxes etc			11,790,000
7	SPS-Solar Power System- 19kwh	1	1,050,000	1,050,000
8	Factory building 50'x100'x25' + 1 shed for misc. works 50'x60'x18' & Quarters, Int. roads etc	1	5,070,000	5,070,000
9	Tools & Equipments	1	90,000	90,000
				18,000,000

Finance by Bank 75%	**TL**	**13,500,000**
Margin- Contribution	Margin	**4,500,000**

Income/day

Plant Capacity	6	Ton per day	Rate/Ton	Income
Daily Production LDO	2.10	Ton	42,000	88,200
Daily Production FO	0.60	Ton	27,000	16,200
Charcoal Production	1.80	Ton	3,000	5,400
Gas produced -recycled				
Total income/day				**109,800**

Recurring cost/day

Direct Cost			Rate/Ton	Exp
Raw materials-waste plastic	6	Ton per day	8,000	48,000
Direct labor				4,800
Catalyst, Spares & Consumables				900
Power, fuel, water				1,200
Total Direct Cost/day				**54,900**

Indirect Costs				
Office exp				1,200
Consultant exp				600
Other exp				1,200
R&M				900
Miscellaneous				1200
Total Indirect Cost/day				**5,100**
Total daily expenses				**60,000**

5 Years Projection figures

Particulars	Year-1	Year-2	Year-3	Year-4	Year-5
Daily Plant Capacity	6	6	6	6	6
Daily Production LDO	2.10	2.1	2.1	2.1	2.1
Daily Production FO	0.60	0.60	0.60	0.60	0.60
Charcoal Production	1.80	1.80	1.80	1.80	1.80
No Days in operation	300	300	300	300	300
Annual Production LDO	630	630	630	630	630
Annual Production FO	180	180	180	180	180
Annual Charcoal Production	540	540	540	540	540
Total Production in Tonn	1350	1350	1350	1350	1350
Capacity Utilisation	80%	85%	90%	95%	100%
Production in Tonn-LDO	504	536	567	599	630
Production in Tonn-FO	144	153	162	171	180
Production in Tonn-Charcoal	432	459	486	513	540
Actual Production in Tonn	1,080	1,148	1,215	1,283	1,350
Selling Price P ton LDO	42,000	43,660	44,970	46,319	47,708
Selling Price P ton FO	27,000	27,810	28,644	29,504	30,389
Selling Price P Ton-Charcoal	3,000	3,090	3,183	3,278	3,377
Sales from LDO	21,168,000	23,379,930	25,497,877	27,721,858	30,056,330
Sales from FO	3,888,000	4,254,930	4,640,377	5,045,121	5,469,973
Sales from Charcoal	1,296,000	1,418,310	1,546,792	1,681,707	1,823,324
Total Sales	26,352,000	29,053,170	31,685,045	34,448,685	37,349,627

Direct Cost	
Purchases	13,500,000
Direct labor	1,260,000
Catalyst, Spares & Consumables	180,000
Power, fuel,water	360,000
Total Direct Cost	15,300,000

Indirect Cost	
Office exp	360,000
Consultant exp	180,000
Other exp	360,000
R&M	270,000
Miscellaneous	360,000
Total Indirect Cost	1,530,000

Working Capital

Three months exp	1st year	90	5,400,000

Finance by Bank 50%	**WC**	50%	**2,700,000**
Margin- Contribution 50%	Margin	say	**2,700,000**

Total Project Cost

Total Project Cost= Bank TL+CC+Margin=			**23,400,000**
Finance by Bank TL+CC			**16,200,000**
Margin-Contribution			**7,200,000**

Notes

Selling price is presumed same in 5 years suiting to current trends
Capacity utilization indicated above is presumed aptly from year 1 to 5
Wef 2nd year min. 20% expenses on R&M of Machinery is expected per annum

Projected Profit and Loss A/c

Sr No	Particulars	PROJECTED YEARS				
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
A	**REVENUE**					
	Sale of LDO, FO & Charcoal	26,352,000	9,053,170	31,685,045	4,448,685	7,349,627
	Closing Stock	4,743,360	7,263,293	8,554,962	7,923,198	7,469,925
	Total	**31,095,360**	**36,316,463**	**40,240,008**	**42,371,883**	**44,819,553**
B	**DIRECT COST**					
1	Opening Stock	0	4,743,360	7,263,293	8,554,962	7,923,198
2	Purchases	13,500,000	14,175,000	14,883,750	15,627,938	16,409,334
3	Direct labor	1,260,000	1,386,000	1,524,600	1,677,060	1,844,766
4	Catalyst, Spares & Consumables	180,000	189,000	198,450	208,373	218,791
5	Power, fuel,water	360,000	381,600	404,496	428,766	454,492
	Total Direct Cost	**15,300,000**	**20,874,960**	**24,274,589**	**26,497,098**	**26,850,581**
C	**Gross Profit**	**15,795,360**	**15,441,503**	**15,965,419**	**15,874,785**	**17,968,972**
D	**OPERATING EXPENSES**					
1	Salary Expenses	1,581,120	1,739,232	1,913,155	2,104,471	2,314,918
2	Transport Charges	790,560	581,063	633,701	688,974	746,993
3	Office Expenses	360,000	378,000	396,900	416,745	437,582
4	Consultant Charges	180,000	198,000	217,800	239,580	263,538
5	Repair & Maintenance- Building	270,000	310,500	357,075	410,636	472,232
6	Repair & Maintenance -Machinery	0	540,000	594,000	653,400	718,740
7	Insurance Expenses	237,168	272,743	313,655	360,703	414,808
8	Telephone Charges	135,000	141,750	148,838	156,279	164,093
9	Printing & Stationary	162,000	275,400	468,180	795,906	1,353,040
10	Marketing expenses	2,108,160	2,192,486	1,973,238	1,578,590	1,262,872
11	Land Rent	360,000	360,000	360,000	360,000	360,000
12	Depreciation	2,709,000	2,223,000	1,849,365	1,554,694	1,317,290
E	**Total Operating Cost**	**8,893,008**	**9,212,175**	**9,225,906**	**9,319,978**	**9,826,106**
F	PBIT	**6,902,352**	**6,229,327**	**6,739,513**	**6,554,807**	**8,142,866**
G	Interest	**3,284,364**	**2,752,608**	**2,153,411**	**1,478,221**	**717,401**
H	PBT	**3,617,988**	**3,476,719**	**4,586,102**	**5,076,586**	**7,425,465**
I	Tax @30%	**1,085,396**	**1,043,016**	**1,375,831**	**1,522,976**	**2,227,639**
J	PAT	**2,532,592**	**2,433,704**	**3,210,271**	**3,553,610**	**5,197,825**
K	Cash Profit	**4,113,712**	**4,172,936**	**5,123,427**	**5,658,081**	**7,512,743**

Projected Balance Sheet

Sr No	Liabilities	PROJECTED YEARS				
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
1	Capital	7,632,592	10,506,295	12,874,567	13,577,777	15,980,162
2	Secured Loan					
	Term Loan	12,000,000	9,000,000	6,000,000	3,000,000	-
	Cash Credit	2,700,000	2,700,000	2,700,000	2,700,000	2,700,000
3	Current Liabilities					
	Provisions	508,320	523,365	537,432	539,822	552,003
	Current Liabilities	2,214,000	2,656,800	3,188,160	3,825,792	4,590,950
	Other Cur. Liabilities	200,000	240,000	288,000	345,600	414,720
	Total	**25,254,912**	**25,626,460**	**25,588,159**	**23,988,991**	**24,237,836**
	Assets					
1	**Fixed Assets**					
	Plant & Machinery	10,021,500	8,518,275	7,240,534	6,154,454	5,231,286
	Solar System	630,000	378,000	226,800	136,080	81,648
	Building	4,563,000	4,106,700	3,696,030	3,326,427	2,993,784
	Tools & Equipments	76,500	65,025	55,271	46,981	39,933
2	Investment, R&D	2,500,000	2,500,000	2,500,000	2,500,000	2,500,000
3	**Current Assets**					
	Stock	4,743,360	7,263,293	8,554,962	7,923,198	7,469,925
	Cash and Bank	1,467,288	1,451,097	1,595,627	1,722,434	2,987,970
	Receivables	1,054,080	1,162,127	1,267,402	1,377,947	1,793,985
	Other Cur. Assets	199,184	181,945	451,533	801,470	1,139,304
	Total	**25,254,912**	**25,626,461**	**25,588,159**	**23,988,991**	**24,237,836**

Capital A/c

Sr No	Particulars	PROJECTED YEARS				
		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
	Opening Balance	-	7,632,592	10,506,295	12,874,567	13,577,777
1	Own Contribution	7,200,000	1,600,000	450,000		
2	Add- Net Profit	2,532,592	2,433,704	3,210,271	3,553,610	5,197,825
3	Less- Drawing	(800,000)	(660,000)	(792,000)	(1,450,400)	(1,295,440)
4	Less- Reserve for Expansion	(1,300,000)	(500,000)	(500,000)	(1,400,000)	(1,500,000)
5	**Closing Balance**	**7,632,592**	**10,506,295**	**12,874,567**	**13,577,777**	**15,980,162**

Ratio

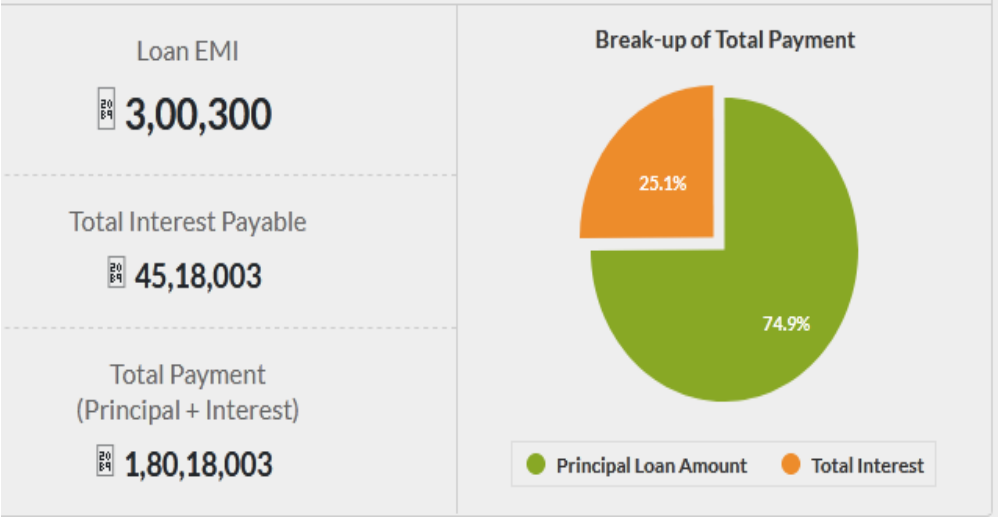
		PROJECTED YEARS				
Ratio	**Formulae**	**YEAR 1**	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**
Current Ratio	CA/CL	2.55	2.94	2.96	2.51	2.41
Quick Ratio	(CA-Stock)/CL	0.93	0.82	0.83	0.83	1.07
GP Ratio	[GP/Sales]*100	59.94	53.15	50.39	46.08	48.11
NP Ratio	[PAT/Sales]*100	9.61	8.38	10.13	10.32	13.92
Oper. Income	[PBIT/Sale]*100	26.19%	21.44%	21.27%	19.03%	21.80%

DEPRECIATION SCHEDULE

Year	Particulars	Plant and Machinery @15%	Solar System @ 40%	Building @10%	Tools & Equipment @ 15%	Total
I	Opening Balance	11,790,000	1,050,000	5,070,000	90,000	18,000,000
	Addition during Yr	0	0	0	0	0
	Total	11,790,000	1,050,000	5,070,000	90,000	18,000,000
	Depreciation	1,768,500	420,000	507,000	13,500	2,709,000
	Closing Balance	10,021,500	630,000	4,563,000	76,500	15,291,000
II	Opening Balance	10,021,500	630,000	4,563,000	76,500	15,291,000
	Addition during Yr	0	0	0	0	0
	Total	10,021,500	630,000	4,563,000	76,500	15,291,000
	Depreciation	1,503,225	252,000	456,300	11,475	2,223,000
	Closing Balance	8,518,275	378,000	4,106,700	65,025	13,068,000
III	Opening Balance	8,518,275	378,000	4,106,700	65,025	13,068,000
	Addition during Yr	0	0	0	0	0
	Total	8,518,275	378,000	4,106,700	65,025	13,068,000
	Depreciation	1,277,741	151,200	410,670	9,754	1,849,365
	Closing Balance	7,240,534	226,800	3,696,030	55,271	11,218,635
IV	Opening Balance	7,240,534	226,800	3,696,030	55,271	11,218,635
	Addition during Yr	0	0	0	0	0
	Total	7,240,534	226,800	3,696,030	55,271	11,218,635
	Depreciation	1,086,080	90,720	369,603	8,291	1,554,694
	Closing Balance	6,154,454	136,080	3,326,427	46,981	9,663,941
V	Opening Balance	6,154,454	136,080	3,326,427	46,981	9,663,941
	Addition during Yr	0	0	0	0	0
	Total	6,154,454	136,080	3,326,427	46,981	9,663,941
	Depreciation	923,168	54,432	332,643	7,047	1,317,290
	Closing Balance	5,231,286	81,648	2,993,784	39,933	8,346,651

TERM LOAN - 13500000 AT 12%

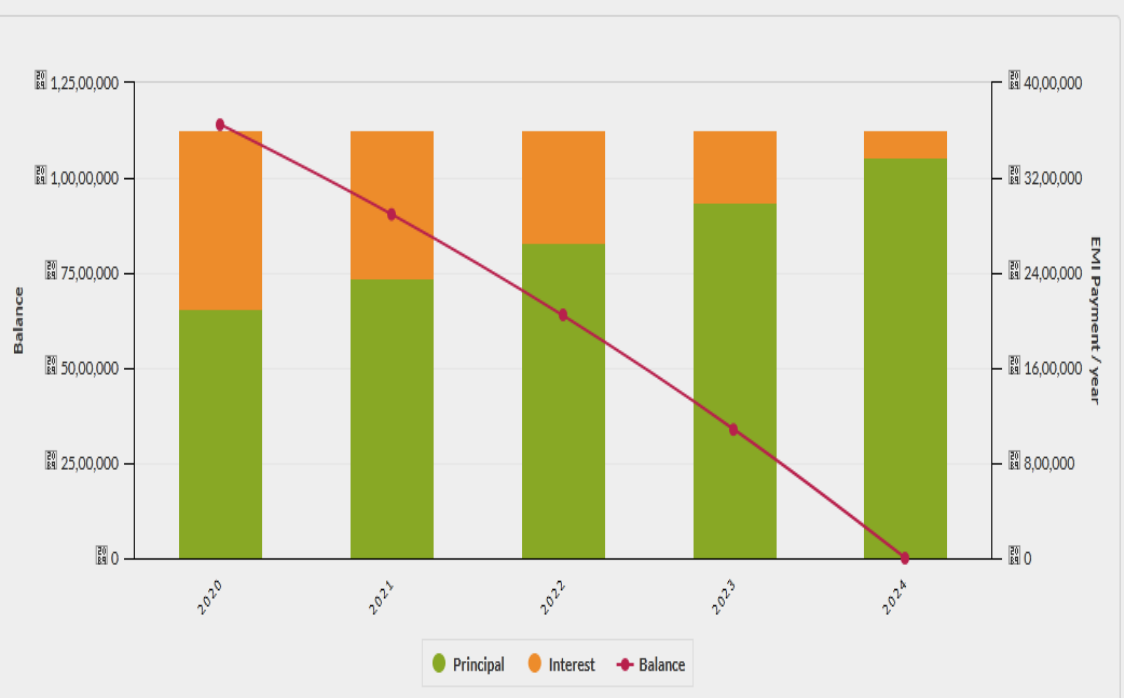
Year	Ope. Bal	Principle	Interest	Total Pay	Clo. Balan
1	13,500,000	1,500,000	3,014,364	4,514,364	12,000,000
2	12,000,000	3,000,000	2,482,608	5,482,608	9,000,000
3	9,000,000	3,000,000	1,883,411	4,883,411	6,000,000
4	6,000,000	3,000,000	1,208,221	4,208,221	3,000,000
5	3,000,000	3,000,000	447,401	3,447,401	-



Cash Credit @10%

Year	Ope. Bal	Interest
1	2,700,000	270,000
2	2,700,000	270,000
3	2,700,000	270,000
4	2,700,000	270,000
5	2,700,000	270,000

Amortization details



Year	Principal (A)	Interest (B)	Total Payment (A + B)	Balance	Loan Paid To Date
⊞2020	₹ 20,96,418	₹ 15,07,182	₹ 36,03,601	₹ 1,14,03,582	15.53%
⊞2021	₹ 23,62,297	₹ 12,41,304	₹ 36,03,601	₹ 90,41,285	33.03%
⊞2022	₹ 26,61,895	₹ 9,41,706	₹ 36,03,601	₹ 63,79,390	52.75%
⊞2023	₹ 29,99,490	₹ 6,04,111	₹ 36,03,601	₹ 33,79,900	74.96%
⊞2024	₹ 33,79,900	₹ 2,23,700	₹ 36,03,601	₹ 0	100.00%

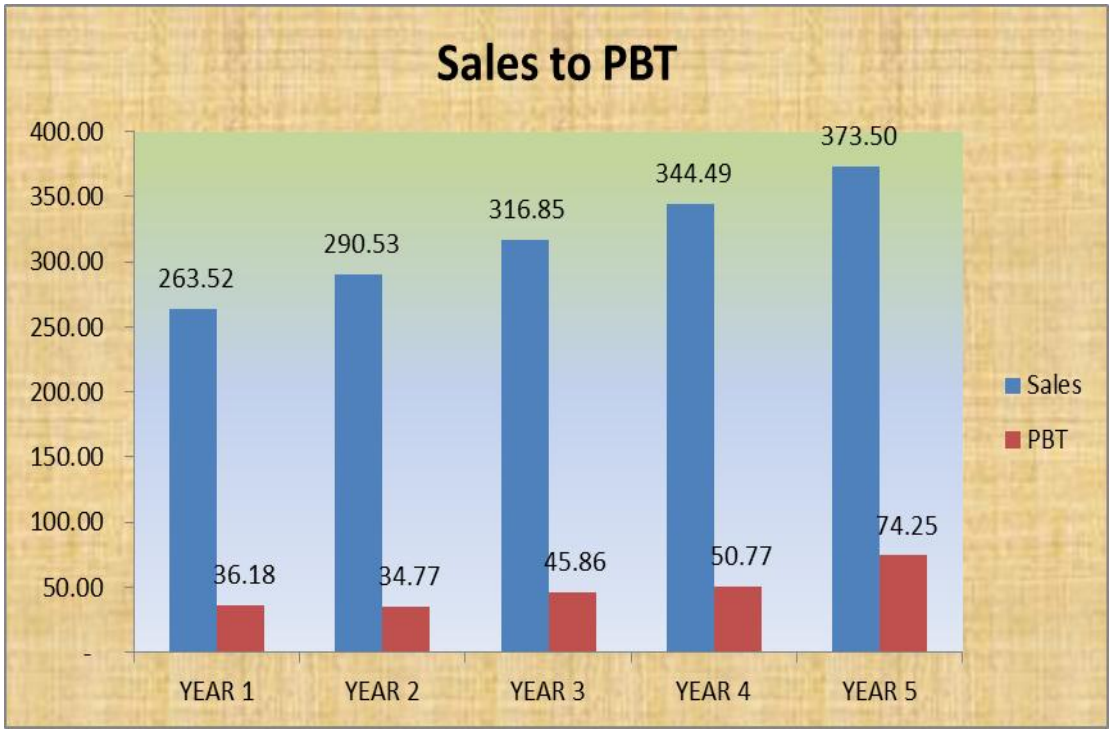
Graphs-1

SALES TO PBT

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Sales	26,352,000	29,053,170	31,685,045	34,448,685	37,349,627
PBT	3,617,988	3,476,719	4,586,102	5,076,586	7,425,465

Rs in Lacs

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Sales	263.52	290.53	316.85	344.49	373.50
PBT	36.18	34.77	45.86	50.77	74.25



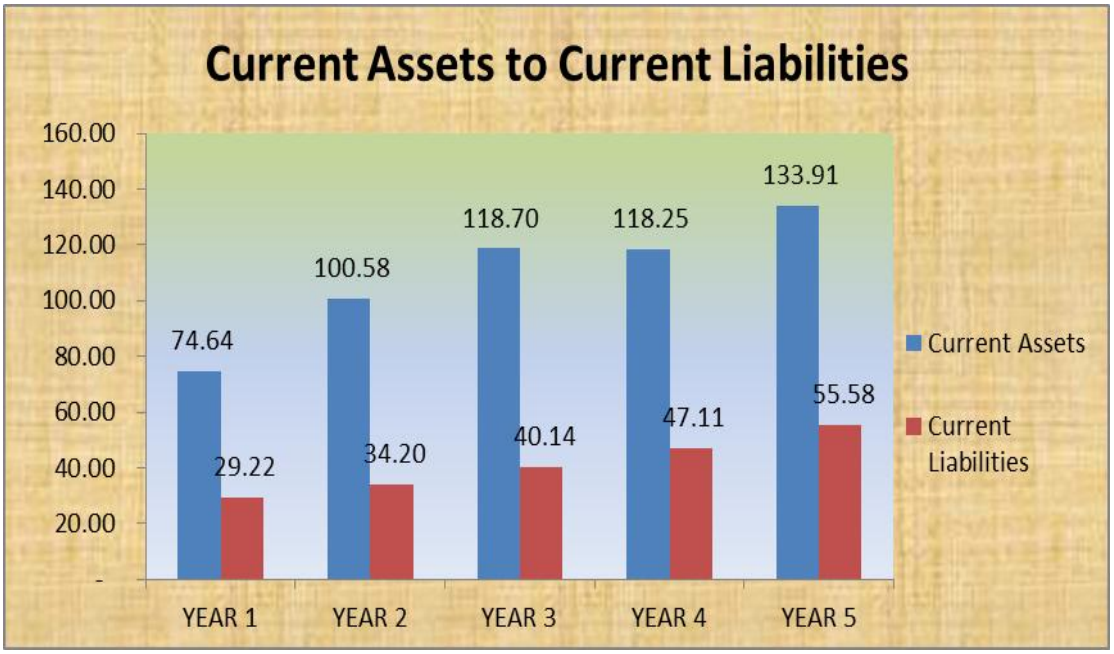
Graphs-2

CURRENT ASSETS TO CURRENT LIABILITIES

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Current Assets	7,463,912	10,058,461	11,869,524	11,825,049	13,391,185
Current Liabilities	2,922,320	3,420,165	4,013,592	4,711,214	5,557,674

Rs in Lacs

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Current Assets	74.64	100.58	118.70	118.25	133.91
Current Liabilities	29.22	34.20	40.14	47.11	55.58
Current Ratio	2.55	2.94	2.96	2.51	2.41



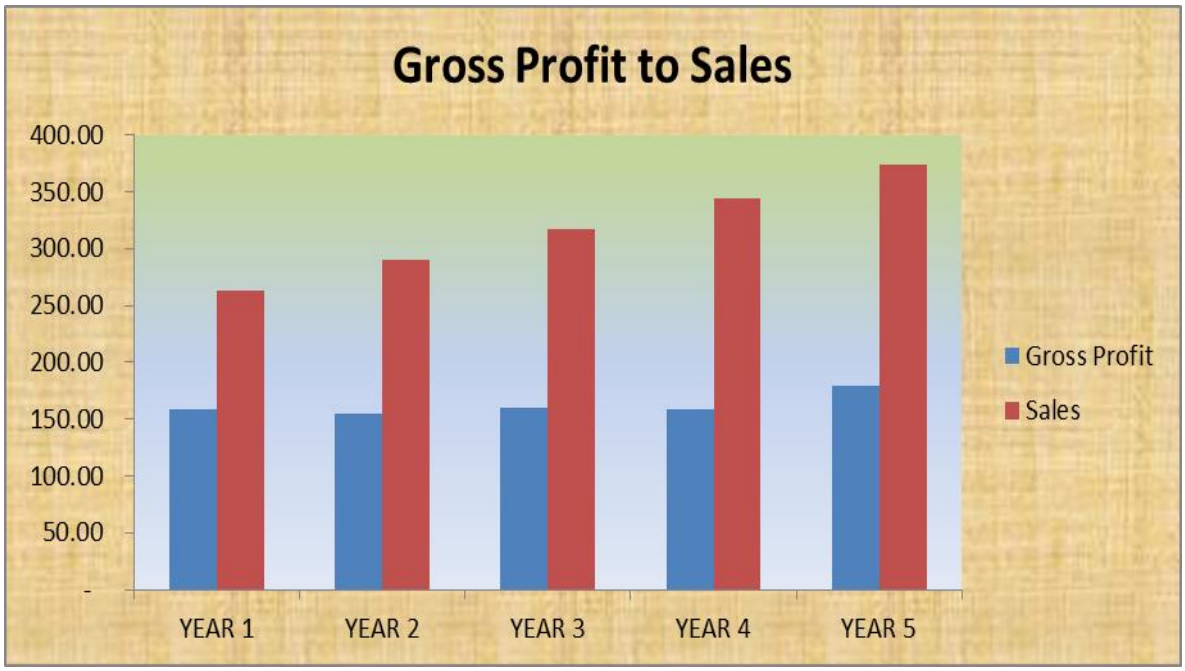
Graphs-3

GP TO SALES

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Gross Profit	15,795,360	15,441,503	15,965,419	15,874,785	17,968,972
Sales	26,352,000	29,053,170	31,685,045	34,448,685	37,349,627

Rs in Mn

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Gross Profit	157.95	154.42	159.65	158.75	179.69
Sales	263.52	290.53	316.85	344.49	373.50
GP in %	60%	53%	50%	46%	48%



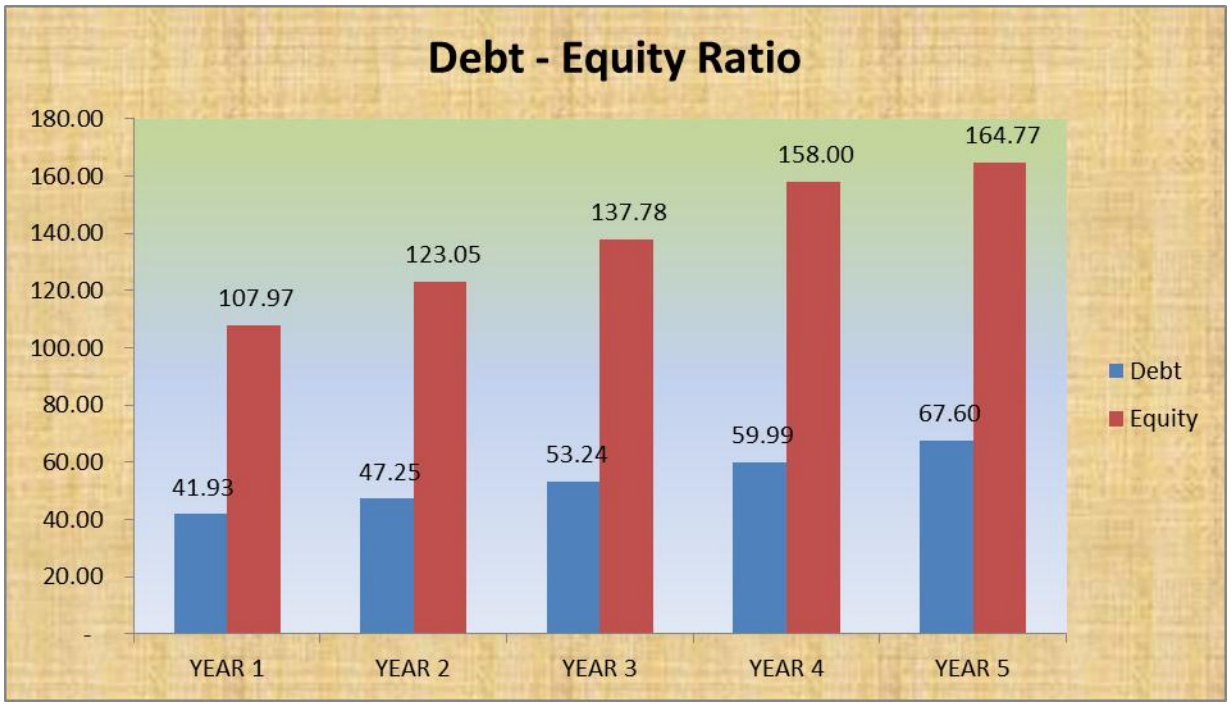
Graphs-4

Debt-Equity Ratio

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Debt	4,192,837	4,724,593	5,323,790	5,998,980	6,759,800
Equity	10,796,925	12,305,458	13,778,211	15,800,480	16,476,590

Rs in Mn

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Debt	41.93	47.25	53.24	59.99	67.60
Equity	107.97	123.05	137.78	158.00	164.77
Ratio	39%	38%	39%	38%	41%



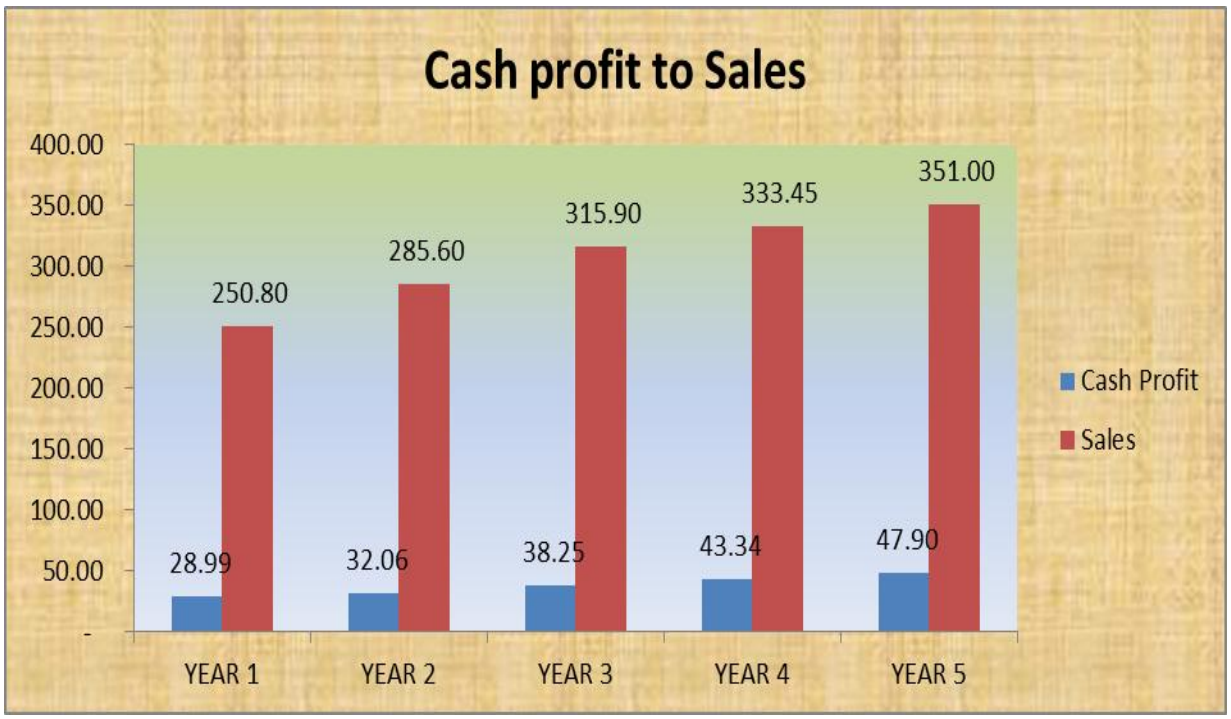
Graphs-5

CASH PROFIT TO SALES

Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 4
Cash Profit	2,899,325	3,206,173	3,825,157	4,334,114	4,790,448
Sales	25,080,000	28,560,000	31,590,000	33,345,000	35,100,000

Rs in Lacs

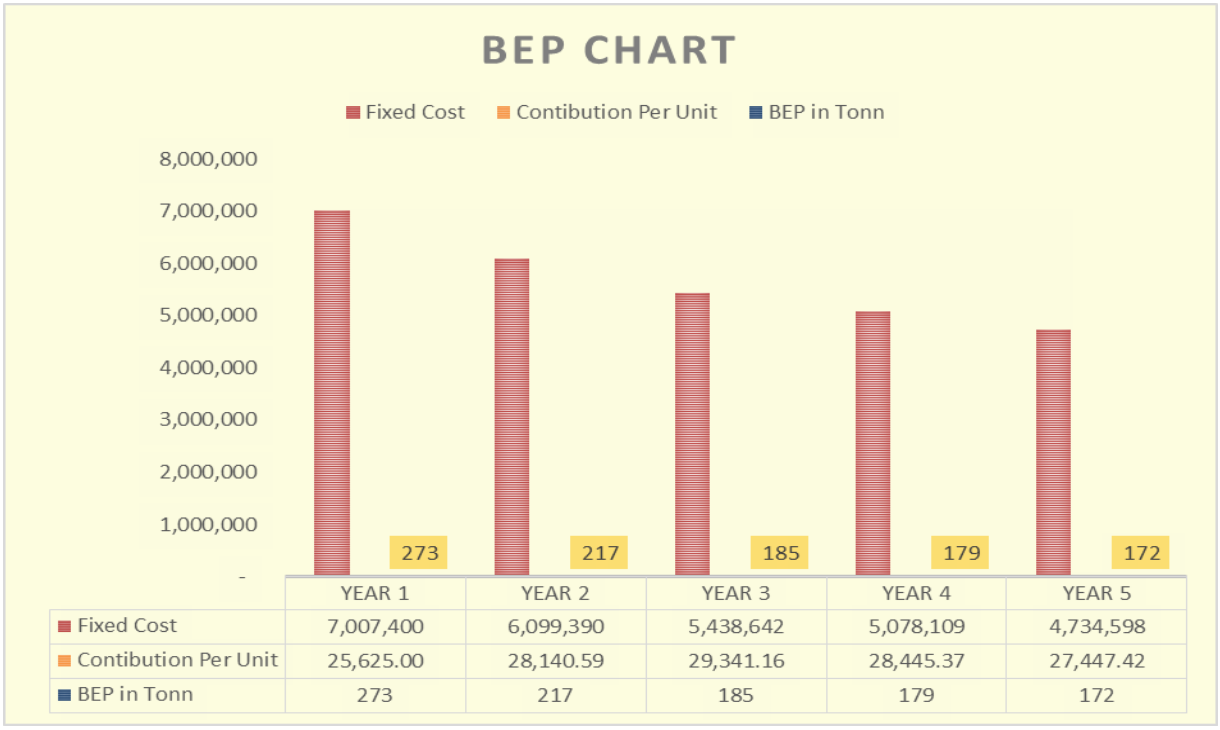
Particulars	PROJECTED YEARS				
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Cash Profit	28.99	32.06	38.25	43.34	47.90
Sales	250.80	285.60	315.90	333.45	351.00



BEP Analysis - Break Even Point Analysis

Particluars	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Production in Tonns	960	1,020	1,080	1,140	1,200
Fixed Cost	7,007,400	6,099,390	5,438,642	5,078,109	4,734,598
Variable Cost	13,800,000	15,156,600	16,911,546	18,872,278	21,063,098
Variable Cost P Unit	14,375.00	14,859.41	15,658.84	16,554.63	17,552.58
Selling Price Per Unit	40,000.00	43,000.00	45,000.00	45,000.00	45,000.00
Contribution Per Unit	25,625.00	28,140.59	29,341.16	28,445.37	27,447.42
BEP in Tonn	273	217	185	179	172
BEP in %	28%	21%	17%	16%	14%

Sale	25,080,000	28,560,000	31,590,000	33,345,000	35,100,000
BEP in %	28%	21%	17%	16%	14%
Minimum sale needed	7,144,130	6,068,918	5,421,744	5,221,753	5,045,538



Sensitivity Analysis

Assumption	
Production in ton	1,080
Price Per Ton	24,400
Cost of sale/Ton	12,585
Fixed Cost	5,067,288

Summarised Income Statement	
Revenue	26,352,000
Cost of Sales	13,592,080
Gross Profit	12,759,920
Operating Expenses	5,067,288
Operating Profit	**7,692,632**

		less 20%	less 10%	Standard	Add 10%	Add20%	
		Production in Tonn					
Operating Profit	**7,692,632**	864	972	1,080	1188	1296	
Price per Tonn	54,000	27,996,632	23,331,032	23,331,032	27,530,072	36,767,960	Add20%
	49,500	21,987,339	17,922,668	17,922,668	21,580,872	29,628,920	Add 10%
	45,000	16,459,387	12,947,511	12,947,511	16,108,199	23,061,713	Standard
	40,500	11,379,810	8,375,892	8,375,892	11,079,418	17,027,176	less 10%
	36,000	6,717,730	4,180,020	4,180,020	6,463,959	11,488,624	less 20%

	Minimum sale needed	7,144,130	6,068,918	5,421,744	5,221,753	5045538

Concluding

This is project related to creating ‘Wealth’ from ‘Waste’ and is in the interest of our beloved country a step to “Swatchha Bharat Abhiyan”

The project is technically feasible and economically viable.

The captioned project has priority in national interest.

Project is benevolent to public at large

Project is expected to be self-supportive in due course.

It is needless to stress that the captioned project may be completed in shortest possible time as from C-to-C i.e. Concept to Completion as all details are finalized pre-hand.

The promoters have taken commendable efforts, in this activity which enjoys ‘noble & social responsibility’.

The project is sure to WIN towards grand success

S. M. Parchure
Chief Consultant

Thanks!