Waste Plastic to Oil Conversion.

Production of Oil from Waste Plastics and Polythene using Pyrolysis Process.

Waste Plastic Pyrolysis
**Introduction**

Pyrolysis is the chemical decomposition of organic substances by heating the word is originally coined from the Greek-derived elements pyro "fire" and lysys "decomposition". Pyrolysis is usually the first chemical reaction that occurs in the burning of many solid organic fuels, cloth, like wood, and paper, and also of some kinds of plastic. Anhydrous Pyrolysis process can also be used to produce liquid fuel similar to diesel from plastic waste. Pyrolysis technology is thermal degradation process in the absence of oxygen.
Plastic waste is treated in a cylindrical reactor at temperature of 300°C – 350°C. Now a day’s plastics waste is very harmful to our nature also for human beings. Plastic is not easily decomposable its affect in fertilization, atmosphere, mainly effect on ozone layer so it is necessary to recycle these waste plastic into useful things. So we recycle this waste plastic into a useful fuel.
Pyrolysis of waste plastic is a prospective way of conversion of waste plastic into low-emissive hydrocarbon fuel. Waste plastic materials viz., polyethylene, polypropylene, polystyrene and polyethylene terephthalate were collected from local convenience store packing materials. Waste plastic material pyrolysis was conducted as individual plastics and as mixed feed in a new laboratory scale batch reactor. Hydrocarbon molecules from the basic materials are split under the impact of catalyst inside the reactor in 70–240 °C. The reduction of process takes place from 500–600 °C to 240 °C in the presence of catalyst. The analyses of pyrolysis products suggested that it can be used as a viable alternative to motor fuel.
It was observed that the yield was better in the case of individual plastic material as opposed to mixed feed in all cases except polypropylene under non-catalysed vacuum process.
Power Generation Using Fast Pyrolysis Liquids

Power production from biomass derived pyrolysis liquids has been under development for the past few years. If technically successful, it would make decentralized bio-energy production possible. Several technologies and system components have been developed by academia, R&D organizations, and industrial companies in many countries. Power plant technologies addressed are diesel engines, gas turbines, and natural gas/steam power plants. Main results are reviewed and R&D needs identified for each technology. The analysis shows that even for the most promising solutions long-term demonstration has not yet been achieved. Pyrolysis liquid use in gas turbine plants and in co-firing mode in large power stations are technically most advanced. Recent work with diesel engines also appears quite promising.
Bio-oil produced from fast pyrolysis has a wide range of applications. The major applications include heat and power generation, liquid fuels, and raw chemical products. The oils produced can be used directly in energy production by combustion, although the heating value of bio-oil is lower than that of fossil fuels (about 40% less than diesel fuel). Basic modifications on boilers to handle the viscosity of the bio-oil are needed to accommodate the material as a burning fuel. Bio-oil produces lower emissions of nitrogen oxide and sulfur gases when burned, especially when compared to fossil fuel emissions.
The waste to energy technology is investigated to process the potential materials in waste which are plastic, biomass and rubber tire to be oil. Pyrolysis process becomes an option of waste-to-energy technology to deliver bio-fuel to replace fossil fuel. Waste plastic and waste tire are investigated in this research as they are the available technology. The advantage of the pyrolysis process is its ability to handle un-sort and dirty plastic. The pre-treatment of the material is easy. Tire is needed to be shredded while plastic is needed to be sorted and dried. Pyrolysis is also no toxic or environmental harmful emission unlike incineration.
Economic growth and changing consumption and production patterns are resulting into rapid increase in generation of waste plastics in the world. For more than 50 years the global production of plastic has continued to rise.

The plastics have become one of the most important and indispensable materials in our contemporary world. These plastics are not presently biodegradable and are extremely troublesome components for land filling. The waste plastics are known for creating a very serious environmental challenge because of their huge quantities and the disposal problems caused by them. The pyrolysis has a wide temperature range and it can be performed with or without a catalyst. Generally used catalysts for this process are mordenite, FCC, USY, ZSM-5, etc.
In pyrolysis (plastic to oil) process, the plastic waste is not burned. But instead plastic is chemically broken down into Pyrolysis Oil, Hydrocarbon Gas and Carbon Black. Plastic to oil is environment friendly technology for disposal of plastic waste. APC has 10+ years of expertise in installing and operating state-of-art plastic to oil plants.

Plastic to oil is chemical technology for converting waste plastic into Pyrolysis Oil, Carbon Black and Hydrocarbon Gas. This reaction takes place inside pyrolysis reactor. Following reaction conditions are essential for conversation of plastic to oil.
Plastic Pyrolysis Process

Pyrolysis is an advanced technology used in disposing waste plastics. Adopting such a technology, our waste plastic pyrolysis plant can convert waste plastics into oil and carbon black, which are both in high demand in the market. Usually, the plastic pyrolysis process can be described as follow:
The global plastic production increased over years due to the vast applications of plastics in many sectors. The continuous demand of plastics caused the plastic wastes accumulation in the landfill consumed a lot of spaces that contributed to the environmental problem. The rising in plastics demand led to the depletion of petroleum as part of non-renewable fossil fuel since plastics were the petroleum-based material. Some alternatives that have been developed to manage plastic wastes were recycling and energy recovery method. However, there were some drawbacks of the recycling method as it required high labor cost for the separation process and caused water contamination that reduced the process sustainability.
Due to these drawbacks, the researchers have diverted their attentions to the energy recovery method to compensate the high energy demand. Through extensive research and technology development, the plastic waste conversion to energy was developed. As petroleum was the main source of plastic manufacturing, the recovery of plastic to liquid oil through pyrolysis process had a great potential since the oil produced had high calorific value comparable with the commercial fuel.
Plastic to oil (fuel) conversion technology has gained prominence primarily due to two factors: forming a reliable source of alternative energy from an abundant feedstock having negligible economic value and an eco-friendly disposal of non-recycled plastics. The rapidly rising volumes of plastic waste has led to the overriding concern of environmental hazards to various habitats, particularly humans and aquatic life. Coupled with this, stringent government regulations against the disposal of plastics and revised risk assessment approaches in developing and developed nations have boosted the market.
The Asia Pacific market is expected to showcase promising growth avenues over the forecast period, mainly driven by the modernizing of different plastic-to-fuel technologies. Countries such as Saudi Arabia, Brazil, and the UAE, also contribute to the substantial demand for plastic waste to oil processes.
Machinery Photographs

CRUSHING UNIT

CUTTING MACHINE
SHREDDING MACHINE

TUBULAR REACTOR
## Project at a Glance

### COST OF PROJECT

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# Project at a Glance

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## Project at a Glance

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<tr>
<td></td>
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<td>%</td>
<td>%</td>
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<td>17.37</td>
<td>14.15%</td>
<td>8.95%</td>
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## Project at a Glance

**BEP**

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<tr>
<td>Cash BEP (% of Installed Capacity)</td>
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<td>Total BEP (% of Installed Capacity)</td>
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**IRR, PAYBACK and FACR**

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<td>Payback Period of the Project is ( In Years )</td>
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<td>Fixed Assets Coverage Ratio ( No. of times )</td>
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Major Queries/Questions Answered in the Report?

1. What is Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing industry?

2. How has the Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing industry performed so far and how will it perform in the coming years?

3. What is the Project Feasibility of Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing Plant?

4. What are the requirements of Working Capital for setting up Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing plant?
5. What is the structure of Waste Plastic to Oil Conversion Business and who are the key/major players?

6. What is the total project cost for setting up Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing Business?

7. What are the operating costs for setting up Waste Plastic to Oil Conversion plant?

8. What are the machinery and equipment requirements for setting up Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing plant?
9. Who are the Suppliers and Manufacturers of Plant & Machinery for setting up Waste Plastic Pyrolysis Manufacturing plant?

10. What are the requirements of raw material for setting up Waste Plastic Pyrolysis Manufacturing plant?

11. Who are the Suppliers and Manufacturers of Raw materials for setting up Waste Plastic Pyrolysis Manufacturing Business?

12. What is the Manufacturing Process of Waste Plastic to Oil Conversion?
13. What is the total size of land required for setting up Waste Plastic Pyrolysis Manufacturing plant?

14. What will be the income and expenditures for Waste Plastic Pyrolysis Manufacturing Business?

15. What are the Projected Balance Sheets of Waste Plastic Pyrolysis Manufacturing plant?

16. What are the requirement of utilities and overheads for setting up Waste Plastic Pyrolysis Manufacturing plant?

17. What is the Built up Area Requirement and cost for setting up Waste Plastic Pyrolysis Manufacturing Business?
18. What are the Personnel (Manpower) Requirements for setting up Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing Business?

19. What is the Plant Layout for setting up Waste Plastic Pyrolysis Manufacturing Business?

20. What is the time required to break-even of Waste Plastic Pyrolysis Manufacturing Business?

21. What is the Break-Even Analysis of Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing plant?

22. What are the Project financials of Waste Plastic Pyrolysis Manufacturing Business?
23. What are the Profitability Ratios of Waste Plastic Pyrolysis Manufacturing Project?

24. What is the Sensitivity Analysis-Price/Volume of Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing plant?

25. What are the Projected Pay-Back Period and IRR of Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing plant?
27. What are the Market Opportunities for setting up Plastic Pyrolysis (Waste Plastic to Oil Conversion) Manufacturing plant?

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Reasons for Buying our Report:

• This report helps you to identify a profitable project for investing or diversifying into by throwing light to crucial areas like industry size, market potential of the product and reasons for investing in the product.

• This report provides vital information on the product like it’s characteristics and segmentation.

• This report helps you market and place the product correctly by identifying the target customer group of the product.
• This report helps you understand the viability of the project by disclosing details like machinery required, project costs and snapshot of other project financials

• The report provides a glimpse of government regulations applicable on the industry

• The report provides forecasts of key parameters which helps to anticipate the industry performance and make sound business decisions
Our Approach:

• Our research reports broadly cover Indian markets, present analysis, outlook and forecast for a period of five years.
• The market forecasts are developed on the basis of secondary research and are cross-validated through interactions with the industry players.
• We use reliable sources of information and databases. And information from such sources is processed by us and included in the report.

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**Scope of the Report**

The report titled “Market Survey cum Detailed Techno Economic Feasibility Report on Plastic Pyrolysis (Waste Plastic to Oil Conversion) provides an insight into Plastic Pyrolysis (Waste Plastic to Oil Conversion) market in India with focus on uses and applications, Manufacturing Process, Process Flow Sheets, Plant Layout and Project Financials of Plastic Pyrolysis (Waste Plastic to Oil Conversion) project. The report assesses the market sizing and growth of the Indian Plastic Pyrolysis (Waste Plastic to Oil Conversion) Industry. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line. And before diversifying/venturing into any product, they wish to study the following aspects of the identified product:
• Good Present/Future Demand
• Export-Import Market Potential
• Raw Material & Manpower Availability
• Project Costs and Payback Period

We at NPCS, through our reliable expertise in the project consultancy and market research field, have demystified the situation by putting forward the emerging business opportunity in the Plastic Pyrolysis (Waste Plastic to Oil Conversion) sector in India along with its business prospects. Through this report we have identified Plastic Pyrolysis (Waste Plastic to Oil Conversion) project as a lucrative investment avenue.

See more

https://goo.gl/5rd15q
https://goo.gl/Rc7VBM
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Our inexhaustible Client list includes public-sector companies, Corporate Houses, Government undertaking, individual entrepreneurs, NRI, Foreign investors, non-profit organizations and educational institutions from all parts of the World. The list is just a glimpse of our esteemed & satisfied Clients.

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Free Instant Online Project Identification and Selection Service

Our Team has simplified the process for you by providing a "Free Instant Online Project Identification & Selection" search facility to identify projects based on multiple search parameters related to project costs namely: Plant & Machinery Cost, Total Capital Investment, Cost of the project, Rate of Return% (ROR) and Break Even Point % (BEP). You can sort the projects on the basis of mentioned pointers and identify a suitable project matching your investment requisites......Read more
NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our Market Survey cum Detailed Techno Economic Feasibility Report provides an insight of market in India. The report assesses the market sizing and growth of the Industry. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.
And before diversifying/venturing into any product, they wish to study the following aspects of the identified product:

- Good Present/Future Demand
- Export-Import Market Potential
- Raw Material & Manpower Availability
- Project Costs and Payback Period

The detailed project report covers all aspect of business, from analyzing the market, confirming availability of various necessities such as Manufacturing Plant, Detailed Project Report, Profile, Business Plan, Industry Trends, Market Research, Survey, Manufacturing Process, Machinery, Raw Materials, Feasibility Study, Investment Opportunities, Cost and Revenue, Plant Economics, Production Schedule,
Working Capital Requirement, uses and applications, Plant Layout, Project Financials, Process Flow Sheet, Cost of Project, Projected Balance Sheets, Profitability Ratios, Break Even Analysis. The DPR (Detailed Project Report) is formulated by highly accomplished and experienced consultants and the market research and analysis are supported by a panel of experts and digitalized data bank.

We at NPCS, through our reliable expertise in the project consultancy and market research field, have demystified the situation by putting forward the emerging business opportunity in India along with its business prospects......Read more
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Who are we?

- One of the leading reliable names in industrial world for providing the most comprehensive technical consulting services

- We adopt a systematic approach to provide the strong fundamental support needed for the effective delivery of services to our Clients’ in India & abroad
We at NPCS want to grow with you by providing solutions scale to suit your new operations and help you reduce risk and give a high return on application investments. We have successfully achieved top-notch quality standards with a high level of customer appreciation resulting in long lasting relation and large amount of referral work through technological breakthrough and innovative concepts. A large number of our Indian, Overseas and NRI Clients have appreciated our expertise for excellence which speaks volumes about our commitment and dedication to every client's success.
We bring deep, functional expertise, but are known for our holistic perspective: we capture value across boundaries and between the silos of any organization. We have proven a multiplier effect from optimizing the sum of the parts, not just the individual pieces. We actively encourage a culture of innovation, which facilitates the development of new technologies and ensures a high quality product.
What do we offer?

- Project Identification
- Detailed Project Reports/Pre-feasibility Reports
- Market Research Reports
- Business Plan
- Technology Books and Directory
- Industry Trend
- Databases on CD-ROM
- Laboratory Testing Services
- Turnkey Project Consultancy/Solutions
- Entrepreneur India (An Industrial Monthly Journal)
How are we different?

- We have two decades long experience in project consultancy and market research field
- We empower our customers with the prerequisite know-how to take sound business decisions
- We help catalyze business growth by providing distinctive and profound market analysis
- We serve a wide array of customers, from individual entrepreneurs to Corporations and Foreign Investors
- We use authentic & reliable sources to ensure business precision
Our Approach

- Requirement collection
- Thorough analysis of the project
- Economic feasibility study of the Project
- Market potential survey/research

Report Compilation
Contact us

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