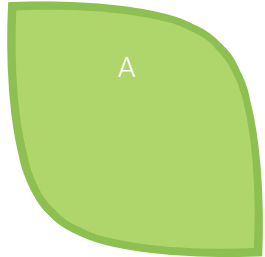




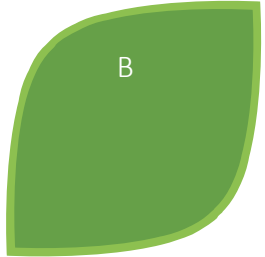
Plastic –a boon or a bane

by Vidya Amarnath, Paterson Energy Pvt Ltd

Plastic is wonderful
because it is
durable



Plastic is Terrible
because it is
durable





Plastics – Benefits ?

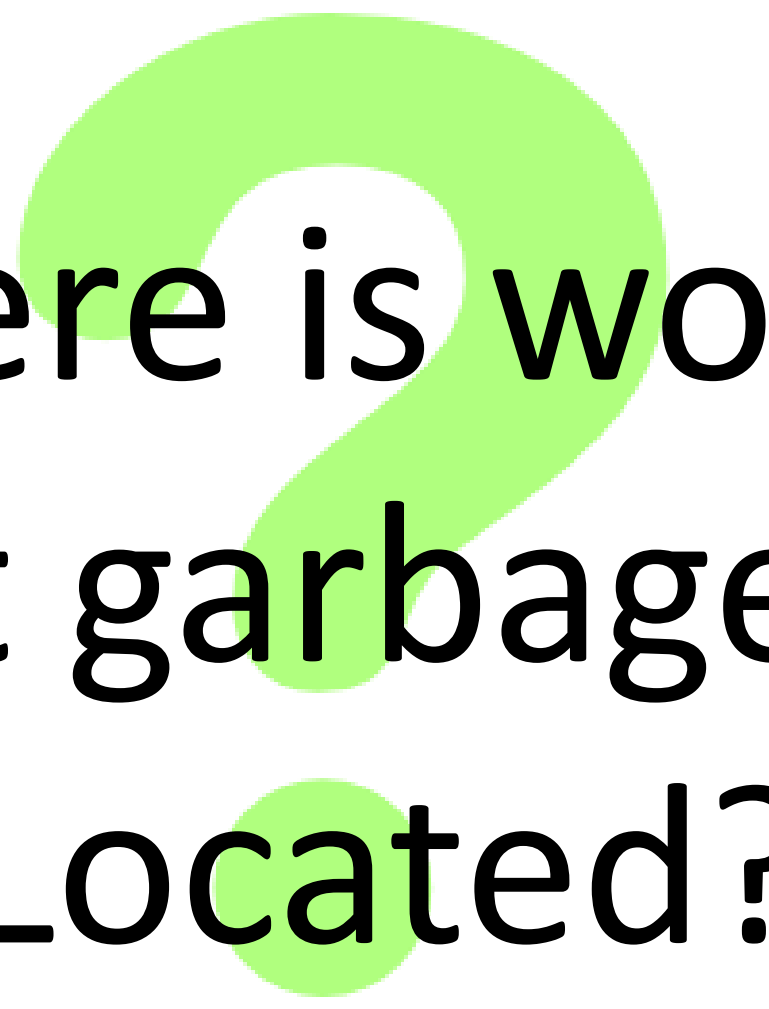
- Plastic packaging withstands the rigors of shipping
- Plastic containers provide good storage solutions at home and in the office.

it seems that the benefits of using plastic are boundless – but are they really?

BECAUSE PLASTIC IS DURABLE.....

- Almost every piece of plastic ever made is still on the planet in some form or another.
- Plastic production globally this year is expected to be more than 300 million tonnes
- Half of which will use just one and then throw away
- By 2050 when the population explodes to almost ten billion people it's expected that plastic production will triple
- The problem with that is that today only a fraction of the plastic that we produced is recycled
- The rest ends up in our environment and it's coating our land and our oceans like a disease

So here is a brain teaser for you...



Where is world's
biggest garbage dump
Located?

Answer : Middle of the Pacific Ocean...

What ??? Did you just say
“IN THE MIDDLE OF
THE PACIFIC OCEAN???”

Well, that's the right answer.

Waste Segregation – Root of problem



Two-bin waste segregation system: MC distributes 10,000 dustbins; people say fit for offices, not for houses

Green dustbins are for disposing of wet waste while the blue ones are for dry waste.

Home >> World Environment Day 2017 >>
Experts' Opinion On Two-Bin Waste Segregation System India Launches On World Environment Day

Experts' Opinion On Two-Bin Waste Segregation System India Launches On World Environment Day

In an ambitious move to make India free from waste, the government is set to launch a massive waste management campaign and a nation-wide guideline for following a 2-bin system in 4,000 cities across the country.



Dry waste to our recycling plants
Wet waste to composting.

Segregation problem handled, What now?

Incineration is a big & obvious “NO NO”

Recycle Plastic to Plastic Again?

This startup's tech could be tipping point in our fight against plastic pollution

By [Pranbihanga Borpuzari](#), ET Online | Updated: Jan 04, 2018, 03:42 PM IST

Varanasi girl Shikha Shah creates pretty things from scrap

by [Nikita Sawant](#) | November 2, 2017, 12:00 AM IST

Indian Company Protoprint Transforms Waste into 3D Printing Filament for Commercial Use

by [Joseph Young](#) | Nov 10, 2016 | 3D Printing, 3D Printing Materials, Business |

Protoprint

This week, we reported on New Zealand-based Waikato University's revolutionary FDM technology-based 3D printing method that allows anyone to print complex objects by

TECHNOLOGY

Feed Your 3D Printer Recycled Plastic

Turn old water bottles into filament

By [Xavier Harding](#) February 23, 2016

Plastic recycling doesn't change the chemical composition thereby negating the whole process of plastic mitigation

Plastic Still Remains Plastic

Environmental Hazard is still very real

Paterson Energy Pvt. Ltd.

Waste to Energy Solutions

Solutions to Plastic waste
management





Paterson
Energy (P) Ltd

Advanced technology to manufacture high quality plastic oil without independent distillation unit.

**Zero effluent
&
zero discharge**

Environmentally compliant
Safe & bankable

What are Plastics – To – Fuel Technologies?

STEP 1:

Plastics that can't be economically recycled are delivered for processing



STEP 2:

Contaminants like metal and glass are removed from the plastic stream



STEP 3:

Plastics are heated without oxygen (pyrolysis)

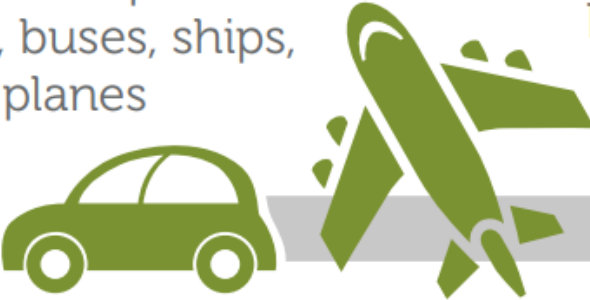


STEP 4:

Gas is cooled and condensed into oil, fuels, and petroleum products

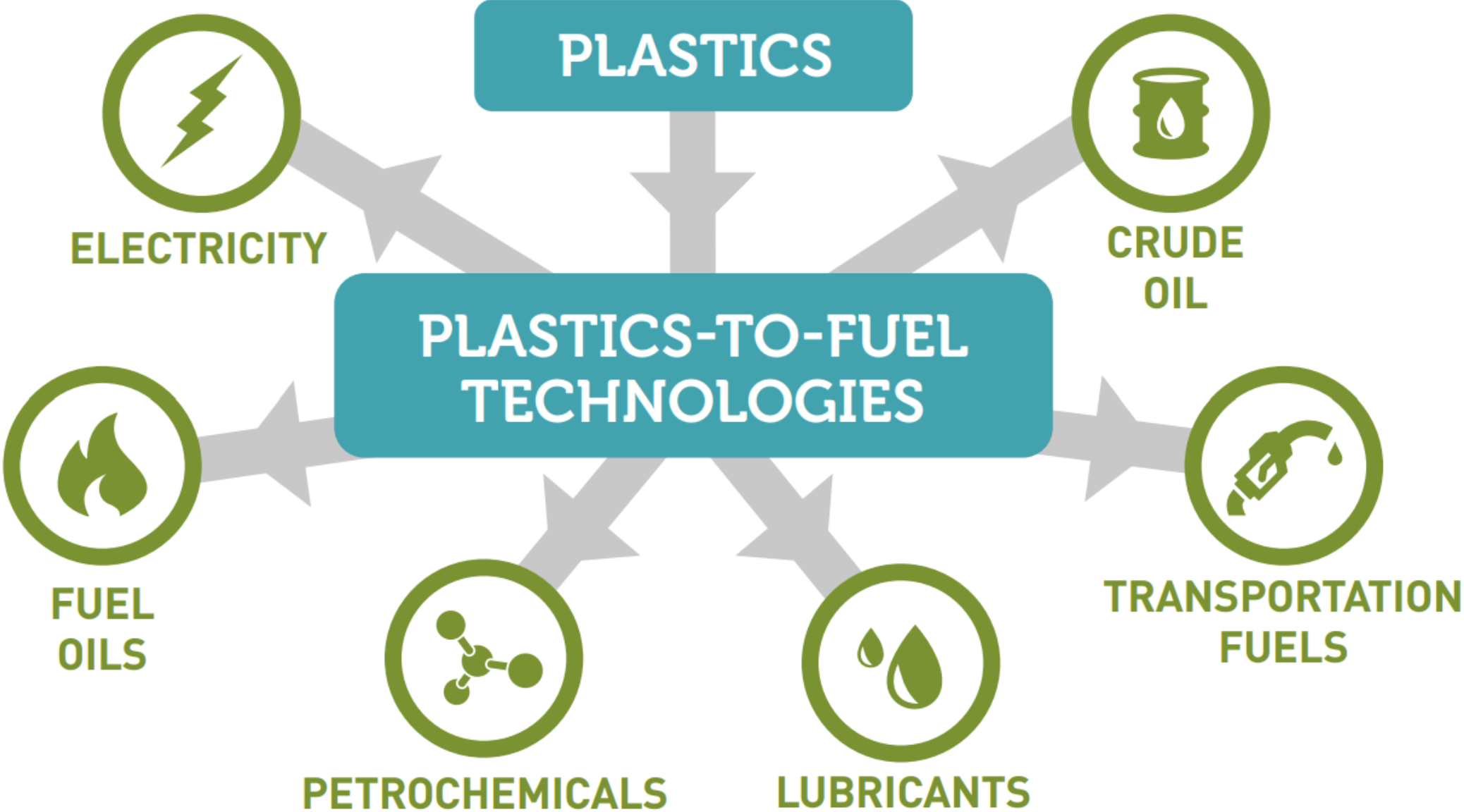


Fuels can power cars, buses, ships, and planes



Petroleum products can then be used by manufacturers and industrial users

Benefits and Versatility of Plastics to Fuel Technologies



Introducing Paterson Energy Pvt. Ltd.

Waste to Energy Solutions



Who are we ?

Background – Paterson Energy Pvt. Ltd



- Paterson Energy is a Waste to Energy Company, recycling plastic waste into quality Plastic Oil using a continuous type Thermochemical Depolymerisation Technology, with a processing capacity of 3TPD – 20TPD (Tons /Day).
- Paterson Energy Pvt. Ltd. is recognized as a startup by DIPP (Department of Industrial Policy & Promotion, Ministry of Commerce and Industry, Government of India).
- Promoted by Senior Professionals, with varied background, but united in their passion for a cleaner & greener future.

Our Vision

To Protect the environment by developing technologies and processes for the mitigation of inorganic waste, with specific focus on Plastics.

Process Description

1 **Shredding /Feed**
The Waste plastic is cleaned and shredded.

2 **Reactor Vessel**
The shredded plastic is fed into the reactor vessel through air lock valve and heated under controlled conditions

3 **Gas Burner**
The reactor is heated initially by burners using furnace oil. Later by gas produced during the process, is reused to heat the reactors.

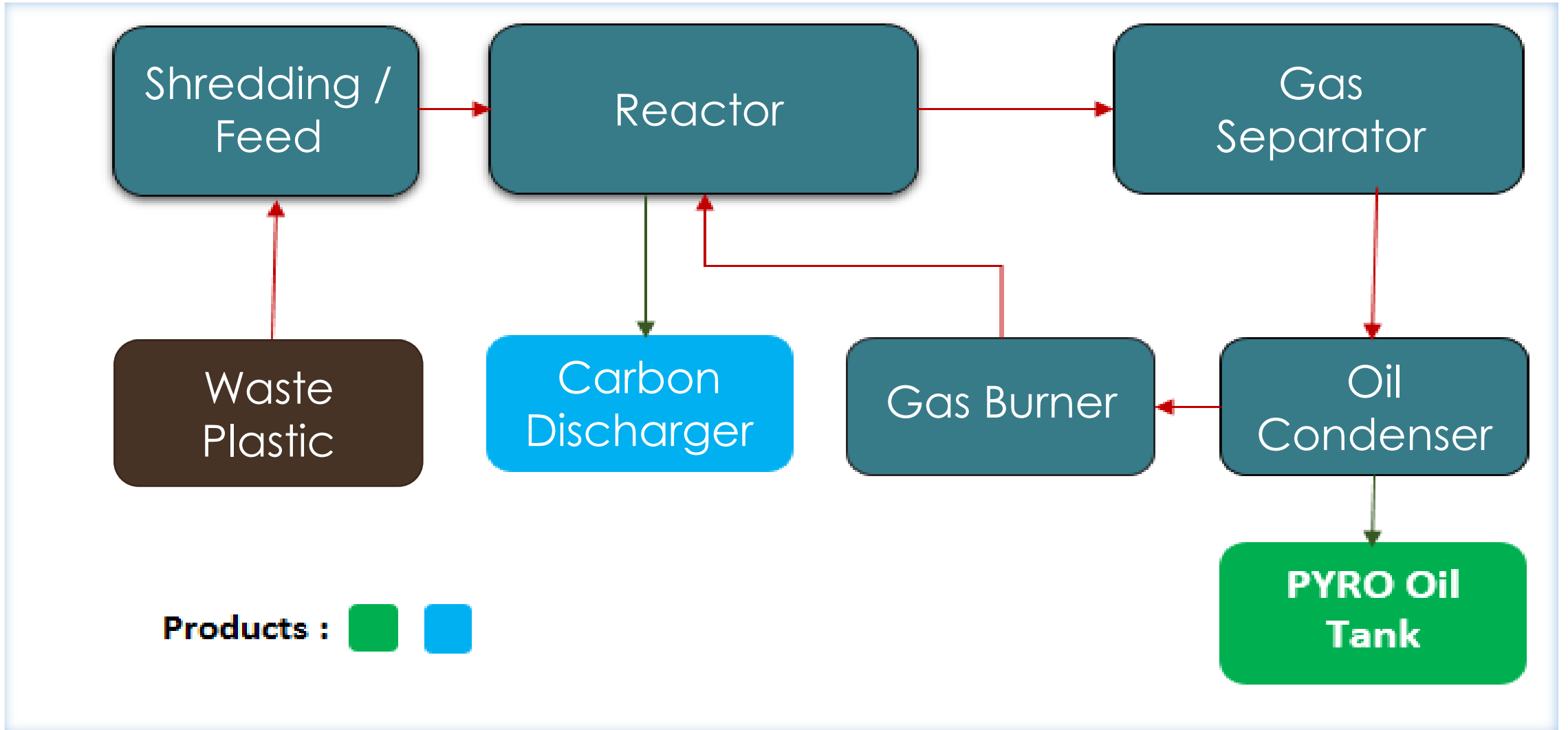
4 **Carbon Discharger**
During the process, Carbon Black in powder form is generated from reactor vessel through air lock valve and is collected separately in bags.

5 **Gas Separator**
Flue Gas is generated due to the thermo-chemical reactions in the reactor.

6 **Condensation**
The vaporized gases are passed through Heat Exchangers, wherein it gets condensed into liquid form and collected in the oil tank.

7 **Heat Management**
The heat exchangers use coolant water as the condensing medium and this water is re-circulated. There is no discharge of cooling water medium.

Process - Flow Chart



Acceptable Plastic Feed Stocks

Process is designed to manage most plastic waste feedstock in single profitable process

2 HDPE

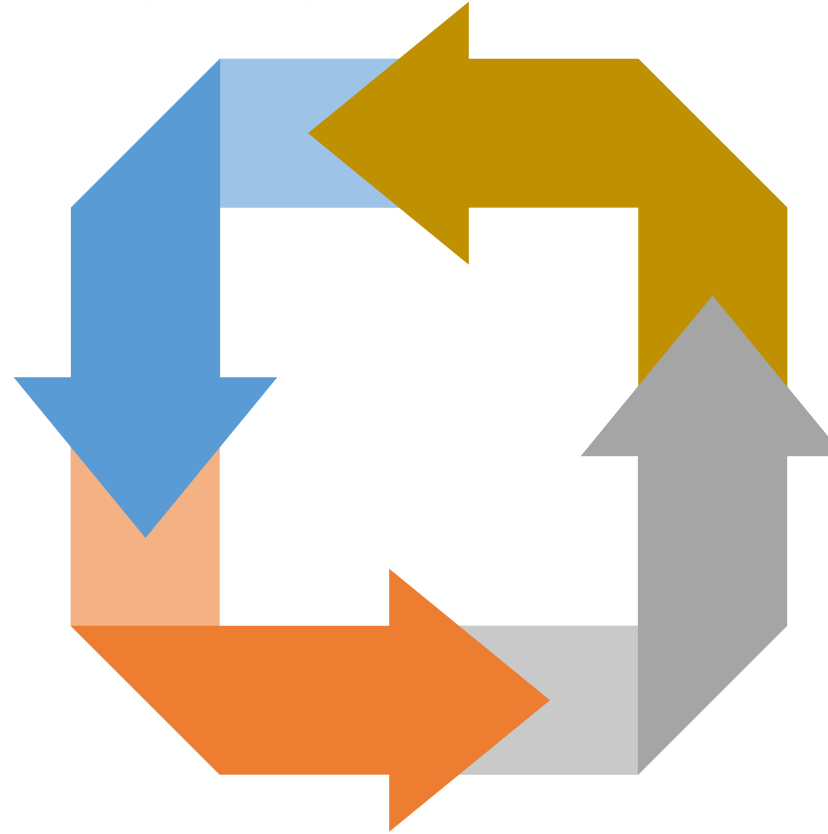
High Density Polyethylene

Toys, buckets, rigid pipes, crates, plant pots, Plastic wood, garden furniture, wheeled refuse bins, compost containers

4 LDPE

Low Density Polyethylene

Films, fertilizer bags, refuse sacks, packaging films, bubble wrap, irrigation pipes, thick shopping bags, wire and cable applications.



5 PP

Polypropylene

Syrup bottles, potato crisp bags, biscuit wrappers, crates, plant pots, drinking straws, refrigerated containers, heavy duty bags, tarpaulins.

6 PS

Polystyrene

Egg boxes, fast food trays, video cases, vending cups, disposable cutlery, seed trays, coat hangers, low cost brittle toys.



Unacceptable feedstocks.

1 PETE – Polyethylene Terephthalate

Fizzy drink, beer bottles, mineral water and soft drink bottles, fiber for clothing and carpets.

3 v – Polyvinyl Chloride

Credit cards, carpet backing and other floor covering, window and door frames, pipes and fittings.

7 – Other

Nylon(PA), Acrylonitrile butadiene styrene, Polycarbonate (PC)

Our Pyrolysis Plant at Uttar Pradesh

High performance continuous waste plastic to oil, Thermochemical Depolymerization plant.

A Navratna PSU Proposes to install a Waste Plastic to fuel conversion facility of a capacity of minimum 5 TPD using feed as waste plastic under PM's Swachh Bharat Abhiyaan as per directives of MoPNG at a suitable location in U.P.



Plant

5 TPD Waste Plastic to fuel conversion facility to be installed adjacent to the MSW Dump yard



Location is at TTZ

The plant is allowed to be set-up in the sensitive area of Taj Trapezium Zone which has stringent rules for establishment of industrial operations.



Licenses

We have procured all the necessary licenses required to run the proposed plant including the crucial Pollution Control Board License.



1st Waste to Energy Plant

The Plant is also the first project in the Waste-To-Energy (WtE) category for our honorable PM's prestigious Swachh Bharat Abhiyaan Scheme.



Certification

We have Standardized the process and made it state of the art, introducing certifications at every level of the pyrolysis process.

State of the Art Plants

Certified/standardized at every level



1. Design Certification

2. Materials for manufacturing certified by TUV GERMANY

3. Manufacturing Quality certified by LLOYDS OR SGS

4. HAZOP operations certified by HAZOP Council of India

5. Standards for process,
Certified by Independent Industry Consultant.

6. SCADA and PLC controlled and monitored plant

Paterson Energy : Solutions

1. Consulting & advisory services for Pyrolysis of plastic.

2. Pilot plant trials: Paterson energy has pyrolysis and fractional distillation pilot plants. Paterson energy tests raw materials to estimate quality and yield of the finished products.

3. Sustainability study: Paterson energy undertakes assignments to assess sustainability of the proposed pyrolysis plant or technology. Economic viability has only 30% importance in project success. Successful projects start with total sustainability study.





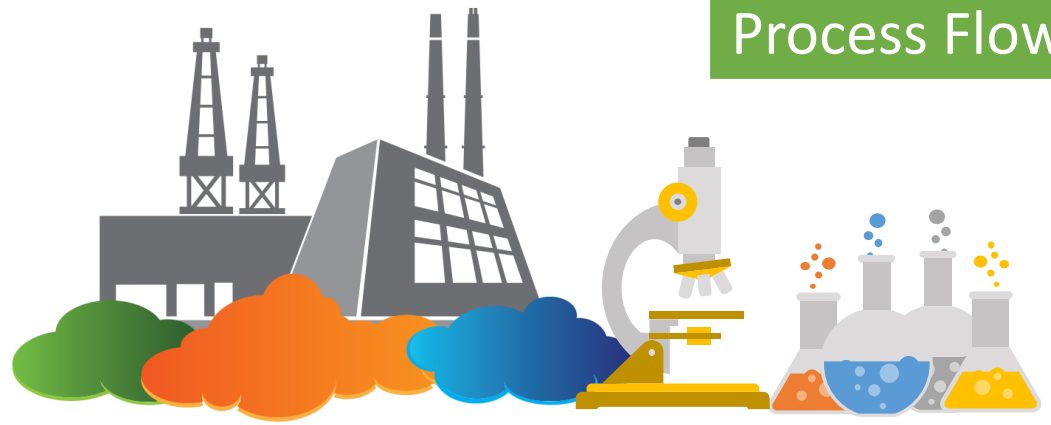
New Enquiry Received



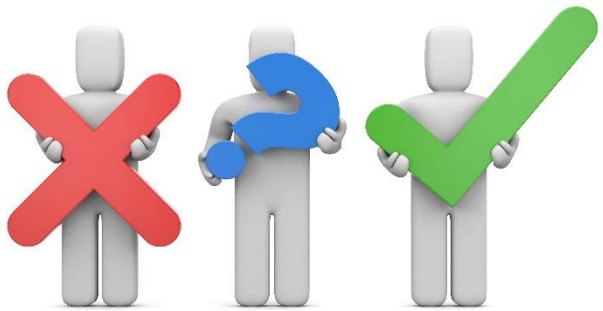
Requirement duly assessed



Our profile, our proposal and NDA arrangements made



Pilot run of plant for Trial to examine Raw Material Feasibility



Discussion on the Results from trial run

If pilot is not successful

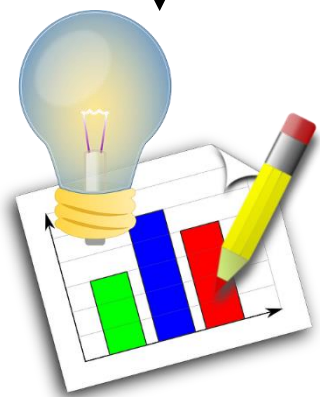


A look at alternative feedstock

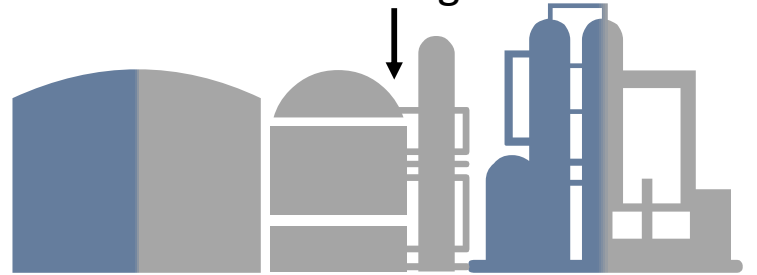
On Successful Pilot Run We move onto Sustainability Report



Sustainable



Process Flow at Paterson Energy



Sustainability Reporting

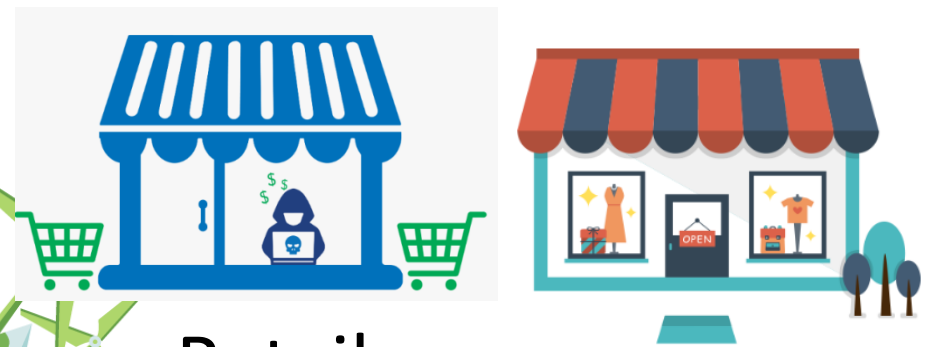


- Availability of Feedstock
- Homogeneity of the Feedstock
- Volume of Feedstock and the Price sensitivity of the same
- Logistics
- Yield



Producers

Plastic Manufacturers, Brands that use plastics



Retailers

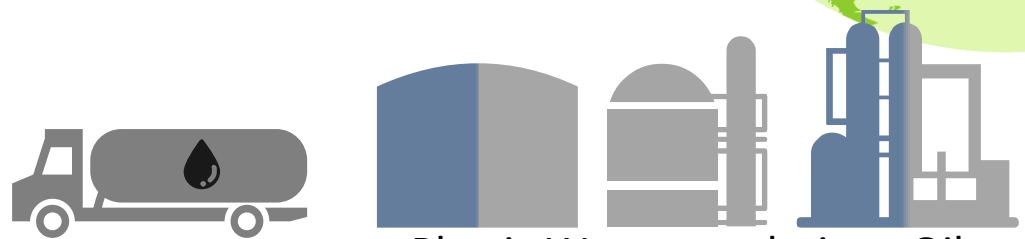
Plastic Products

How we are relevant :-
Extended Producer Responsibility (EPR) & Producer Responsibility Organization (PRO):
Paterson energy has expertise in plastic waste collection & its chemical recycling through pyrolysis. If you are a large corporate, your entire EPR responsibility of can be taken care by Paterson energy.



Consumer

Plastic products used and disposed



Plastic Waste pyrolysis to Oil



Collection Programs

Plastic Waste collected from retailers, haulers, government cleanup etc

Plastic Waste Disposal @ Paterson Energy

**Our goal is to do business with
people who believe what we believe
and we believe we can make a
difference to plastic waste crisis**

