

## POLY TRANSFORM PVT. LTD.

*Closing the Loop with Clean Energy Innovation*



# WASTE PLASTIC TO FUEL TECHNOLOGY

TRANSFORMING PLASTIC WASTE INTO VALUABLE ENERGY RESOURCES

*Engineering Waste into Sustainable Energy*

Poly Transform Knowledge Series

## Why Waste Plastic Matters

Plastic waste has become one of the world's most pressing environmental challenges. Large quantities of non-recyclable plastics continue to accumulate in landfills and the natural environment.

Waste Plastic to Fuel technology offers an alternative approach by converting suitable plastic waste into useful liquid fuel through controlled thermochemical processing. Rather than treating plastic solely as waste, this approach recognizes it as a valuable hydrocarbon resource.



### ● DID YOU KNOW?

Many common plastics originate from petroleum, making them suitable candidates for energy recovery through advanced conversion technologies.

# From Waste to Resource

The process begins with appropriate plastic feedstock preparation, followed by thermochemical conversion in a controlled reactor environment. Hydrocarbon vapors generated during the process are condensed into liquid fuel, while process gas and carbonaceous residue may also be recovered depending on system design.

## THERMOCHEMICAL CONVERSION REACTOR

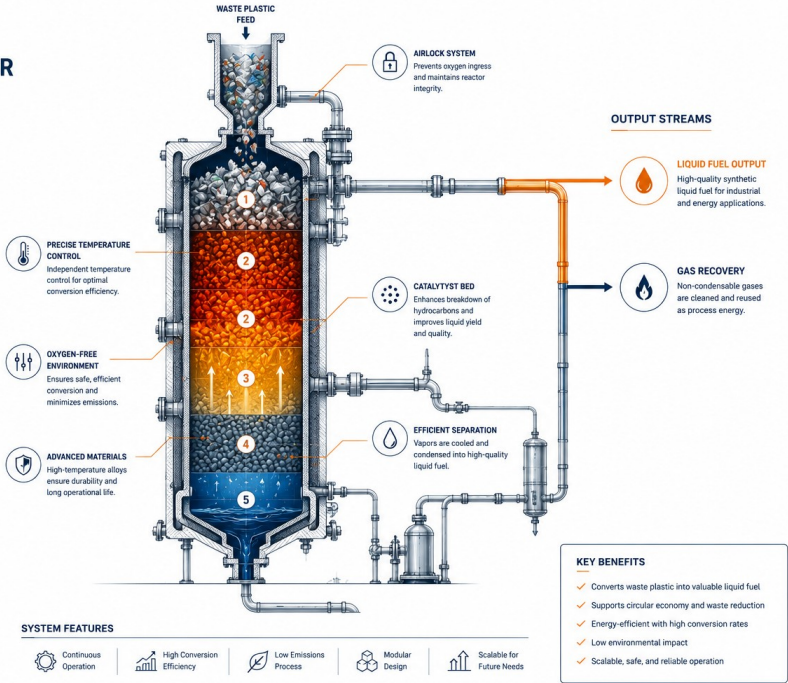
Transforming Waste Plastic  
into Sustainable Liquid Fuel

Advanced thermochemical technology converts mixed waste plastic into high-value liquid fuel through a controlled, oxygen-free process.

PROCESS ZONES

- 1 FEED INTRODUCTION ZONE**  
Waste plastic is introduced into the reactor through an airlock system to maintain an oxygen-free environment.
- 2 PYROLYSIS ZONE**  
Plastic is heated in the absence of oxygen, causing long-chain polymers to break down into hydrocarbon vapors.
- 3 VAPOR TRANSITION ZONE**  
Vapors pass upward through a controlled temperature gradient, separating gases from heavier hydrocarbons.
- 4 CATALYTIC CRACKING ZONE**  
Vapors contact catalyst material, enhancing conversion efficiency and optimizing the hydrocarbon distribution.
- 5 PRODUCT COLLECTION ZONE**  
Condensed liquid fuel is collected, while non-condensable gases are recovered for energy use.

- LIQUID STREAM
- GAS STREAM
- SOLID FEED
- COOLING SYSTEM



### POLY TRANSFORM PRINCIPLE #1

### Waste is Opportunity

Every material has value. Through scientific thinking and responsible engineering, materials once considered waste can become valuable resources that contribute to a cleaner and more sustainable future.

# Delivering Practical Value



## Benefits

- Supports circular economy principles
- Reduces landfill dependence
- Resource recovery from suitable plastics
- Potential reduction in environmental burden

## Applications

- Industrial heating
- Boilers
- Furnaces
- Diesel replacement (subject to fuel specifications and applicable regulations)
- Research and energy applications

# TRANSFORMING WASTE INTO VALUE

CLEAN FUEL. CIRCULAR FUTURE.

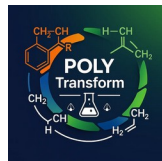
Advanced thermochemical technology  
converts plastic waste into  
sustainable liquid fuel.



SUSTAINABLE  
LIQUID FUEL

INNOVATION | SUSTAINABILITY | CIRCULARITY

*Recovering value from waste through responsible engineering and innovation.*



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