



**PLASTIC TODAY
FUEL TOMORROW**

THE PROBLEM OF PLASTICS



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The growth of plastics production in the past 65 years has substantially outpaced any other manufactured material. The same properties that make plastics so versatile in innumerable applications - durability and resistance to degradation - make these materials difficult or impossible for nature to assimilate.

Thus, without a well-designed and tailor-made management strategy for end-of-life plastics, humans are conducting a singular uncontrolled experiment on a global scale, in which billions of metric tons of material will accumulate across all major terrestrial and aquatic ecosystems on the planet.

The time for a concerted global action on plastic menace is now, before plastic waste kills planet earth.

THE THREE DIFFERENT FATES FOR PLASTIC WASTE.

- First, it can be recycled or reprocessed into a secondary material delaying, final disposal.
- Second, plastics can be destroyed thermally has been detrimental to climate to the climate.
- Thirdly, plastics can be discarded and either contained in a managed system, such as sanitary landfills, or left uncontained in open dumps which eventually will find its way to the oceans. By 2050 there is going to be more plastic waste in the oceans than the mass of all the fish put together.

At Hydroxy Systems we give a fourth solution. Make Plastic disappear from the face of the earth as Fuel

THE PROBLEM OF PLASTICS

Plastic was historically called “Parkesine”, invented by Alexander Parkes in 1862.

Plastic as polymers originated in 1920, but polyethylene, polystyrene and nylon are products of the innovations and inventions during the second world war.

The 1950s have seen the emergence of polyester, polypropylene and High density polyethylene (HDPE) and from then on it is a geometric progression for plastics as it has become widely used from packaging to medical devices to even bullet proof vests (Kevlar).

PLASTICS IS A CONVENIENCE TO USE BUT A NUISANCE TO DISPOSE.

Plastics have outgrown most man-made materials and have long been under environmental scrutiny. As of 2015, approximately 6300 million metric tonnes of plastic waste had been generated, around 9% of which had been recycled, 12% was incinerated, and 79% was accumulated in landfills or the natural environment. If current production and waste management trends continue, roughly 12,000 million metric tonnes of plastic waste will be in landfills or in the natural environment 2050 including oceans by 2050.

The share of plastics in municipal solid waste (by mass) increased from less than 1% in 1960 to more than 10% by 2005 with single use plastic.





THE CASE FOR HYDROXY SYSTEMS TECHNOLOGY

At Hydroxy Systems we looked at chemical recycling holding a positive promise for a quicker positive impact on global environment.

To make sure plastic keeps its value we need chemical recycling which provides the potential for infinite recyclability. But the challenge lies in achieving it in a sustainable and economic way at scale. Chemical recycling breaks the plastic down at a molecular level. This means the monomer can be recovered.

Some plastics, such as polyolefins – the material in a polyethylene plastic bag – don't have weak monomer links, making it harder to chemically recycle them. In such cases, a process called pyrolysis is used, a different process to burning, which relies on high reaction temperatures to typically produce fuels.

We burnt mid night oil to perfect plastic waste to fuel. Patents are filed in the USA and India and are pending.

Hydroxy systems technology essentially is similar to pyrolysis in so far as the shredded plastic waste is heated in the absence of oxygen at atmospheric pressure, but the heat is generated using electricity rather than combustion of some other fuel making it almost zero pollution. An algorithm of heating processes is executed in the closed reactor by heating the plastic waste to high temperatures through electrical heating.

The algorithm based on type of plastic waste sets of heating cycles which last for 18 to 21 hours. The chemical bonds are broken and depolymerised substance in the form of hot gaseous mixture is led into a two stage condensation called hot condensation and cold condensation.

The usual refining process uses a vertical condensation model but Hydroxy systems uses its own patent pending technology of horizontal condensation – condensing and distilling the gaseous mixture into three main components - Diesel, Petrol and Kerosene. The residual gaseous mixture also has a high calorific value and is fed to the generator which produces electricity for heating thus optimising on electricity usage. The residual material left over in the reactor is activated carbon which could have industrial applications but is currently being used by the municipalities as fertilizer in parks.

The Hydroxy Systems Ltd technology is unique and different from other forms of pyrolysis attempted in India and abroad in the sense that we derive motor grade fuel directly from plastic waste which can be fed directly into automobiles without further process besides being a net energy positive process. We just subject the fuel to a multistage filtration to avoid soot in the exhaust.

One tonne of plastic waste depending on the composition and quality of waste can generate a minimum of 500 litres of diesel apart from small quantities of petrol and kerosene.

**With us Plastic waste is no longer a
savage burden on the planet Earth.
It can be now be a fuel pump in your
neighborhood**



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