

# WHAT IS PYROLYSIS?

## DEFINITION

Pyrolysis is the thermochemical decomposition of organic material at high temperature (350-800°C) and in the absence of oxygen or in an atmosphere of inert gases, where materials break into shorter-chain hydrocarbons. In waste-to-energy sector pyrolysis can turn mixed plastic waste into oil, which can be cracked into petrochemicals and plastics.

Due to the lower process temperature pyrolysis processes lower emissions of air pollutants than combustion.



## WHAT KIND OF WASTE CAN BE PROCESSED BY PYROLYSIS?



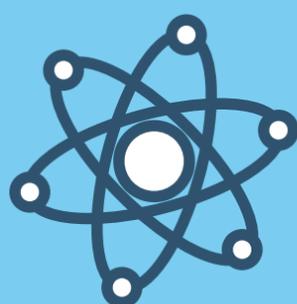
Various types of raw material can be used, including industrial, domestic and plastic waste etc. During pyrolysis, the organic components of the material are decomposed and the inorganic ingredients (e.g. metals) remain practically unaltered, can be separated and reused. Pyrolysis is viable solution for mixed waste, for which mechanical recycling is not efficient.

## PYROLYSIS PRODUCTS

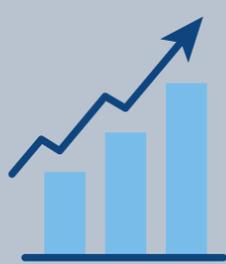
1. Pyrolytic gas with hydrogen light hydrocarbons (methane, ethane, etc.) as the major components. This gas has a significant calorific value.

2. Pyrolytic oil which is more applicable than gas, but its composition and heating value depends on the feedstock and the pyrolysis conditions.

3. Pyrolytic char - a solid fraction which mainly consists of a carbon-rich substance. The heating value of pyrolytic char is comparable to coal. Herewith some heavy metals and other hazardous elements may also remain in the solid products.



## NUMBERS



1. Producing low-sulfur diesel fuel via pyrolysis of waste plastics is up to 14% less greenhouse gas intensive than making the same fuel from crude oil.

2. Widespread implementation of chemical recycling (and pyrolysis) in the Netherlands would reduce greenhouse gas emissions by about 300,000 t per year.

3. By avoiding production of virgin materials, depolymerization saves 1.5 t of CO<sub>2</sub> per metric ton of recycled plastic.

4. With pyrolysis, about 70% of mixed plastic waste can be converted into secondary raw materials.

## WASTE4ME APPROACH

What type of pyrolysis is used at Waste4ME? High temperature slow non-catalytic pyrolysis. When waste is converted into energy/electricity we use pyrolysis. When we convert plastics into oil we use chemical recycling.

Does Waste4ME processes organic and non-organic waste? Yes, we process both organic and non-organic waste by means of pyrolysis. E.g. plastic, metal and minerals as non-organic waste that we can recover, and biomass or others as organic waste.

