Aston University

EBRI
European Bioenergy Research Institute

How the Pyroformer™ Process Works

GREEN HYDROGEN

Hydrogen gas produced by the Pyroformer™ Gasifier can be separated and stored for applications in the 'Hydrogen Economy'.

BIOMASS

The Pyroformer™ is able to transform organic wastes and residues (biomass) into heat, power and other marketable products. It is able to handle a wide range of feedstocks, including traditionally 'hard to treat' materials such as residues with high water content (up to 40%). The process does not require expensive pre-processing as the technology is able to process pellets and briquettes.

Farm Slurries
Municipal Waste
Industrial Residues
Agricultural Residues
Food Residues

H_2

PYROFORMER™ GASIFIER

Pyrolysis gases produced in the Pyroformer™ can be fed directly into a Gasifier to upgrade the gases into clean and efficient gaseous fuels for Gas Engines.

Combustable pellets and briquettes

ANAEROBIC DIGESTION

Digestate from anaerobic digestion can be dried for use as a feedstock for the Pyroformer™ as a sustainable alternative to land-use applications.

PYROFORMER™

EBRI's patented Pyroformer™ technology uses intermediate pyrolysis to pyrolyse and chemically process waste material in a single step. The reaction temperature for this process is around 450-500°C. The controlled thermal treatment and chemical reforming process produces a vapour stream that is free from particulates and tars and eliminates the need for expensive filtrations systems.

H_2O

WATER

The water fraction produced by the Pyroformer™ can be recycled to the digester tank to increase the biogas yield.

Bio-Activated Fuels Reactor

PLASTICS PYROFORMER-BAF

Pyrolysis gas from the Pyroformer™ can be used to undertake the thermo-chemical 'cracking' of plastic. Pyrolysis gas reacts with the hot long-chain molecules in the molten waste plastics, resulting in the thermal and chemical 'cracking' of the hydrocarbon molecules (at a significantly ower temperature than thermal cracking alone) to produce high-quality engine fuels.

Gas Engine

Gas Components
Oil Components

HEAT & POWER DUEL FUEL CHP

Pyrolysis oils are struck with diodiesel to produce a fuel for CHP engines. Tar and particulate-free gas can be fed directly into engines without the need for hot-gas filtration processes.

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(BIO) CHAR

The Pyroformer™ produces a physical residue in the form of a biochar (charcoal). The biochar has market value in excess of £1,000 per tonne for use in soil enhancement or carbon sequestration. Char can also be used for co-firing in power stations.

COMBINED HEAT & POWER