

## Glossary

### Biological gas (biogas)

A gas created by breaking down material in some biological treatment plants. The gas can be used to create electricity, heat and / or vehicle fuel.

### Compost-like output (CLO)

Mixed waste including organic material that has been composted.

### Microbes

Small life forms (usually single cells) which are too small for humans to see but which are essential in nature to break down organic material.

### Non-recyclable waste (general waste)

Often known as black bag waste or mixed waste, it is a mixture of discarded materials (rubbish) collected within the same bag or container and which is not recycled.

### Organic material

Natural material such as food waste and garden waste.

### Preparation for treatment

The process of preparing a material for thermal or biological treatment (e.g. shredding or mixing) to make it more efficient.

### Treatment

A type of process which reduces the quantity of input material either by using heat (thermal treatment) or a biological process. They also produce heat, electricity, fertilisers or other outputs.

## Further information

### Zero Waste Scotland (ZWS)

For more information on Zero Waste Scotland, its work and research, please visit: [www.zerowastescotland.org.uk](http://www.zerowastescotland.org.uk)

For more information on waste facilities and how they are developed, please visit: [www.zerowastescotland.org.uk/infrastructure](http://www.zerowastescotland.org.uk/infrastructure)

### Scottish Environment Protection Agency (SEPA)

For information on waste regulation, licencing, data and more detailed technical information on facility types and the standards they are required to achieve, please visit:

[www.sepa.org.uk](http://www.sepa.org.uk)

### Recycle for Scotland

For more information on how to reduce, re-use and recycle, please visit: [www.recycleforscotland.com](http://www.recycleforscotland.com)

### Videos

To watch videos explaining what different facilities do, please visit:

[www.recycleforscotland.com/facts-figures/facts-figures](http://www.recycleforscotland.com/facts-figures/facts-figures)

### Chartered Institution of Wastes Management (CIWM)

For more detailed and technical information on different facilities and on waste management issues in general, please visit:

[www.ciwm.co.uk](http://www.ciwm.co.uk)

### Renewable Energy Association

For more information on thermal and biological treatment facilities which create energy from waste, please visit:

[www.r-e-a.net/renewable-technologies](http://www.r-e-a.net/renewable-technologies)

### Environmental Services Association

For more information on waste management and the different types of facilities, please visit: [www.esauk.org/](http://www.esauk.org/)



For more information about Zero Waste Scotland's terms and conditions, please visit [www.zerowastescotland.org.uk/content/terms-conditions](http://www.zerowastescotland.org.uk/content/terms-conditions)

If you have any questions please contact [data@zerowastescotland.org.uk](mailto:data@zerowastescotland.org.uk)



## Breaking it down

# Mechanical Biological Treatment



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## Overview

Mechanical biological treatment (MBT) facilities combine the technology used in materials recovery facilities (MRFs) with anaerobic digestion (AD) or a composting process. If AD is used, then energy is produced. It is important to note however, that MBT takes in general waste rather than separated recyclables or organic materials.

There is another technology known as Mechanical Heat Treatment (MHT) which replaces the biological technology with a heating process. The most common type of MHT is called autoclaving, and this is widely used for healthcare waste. However, MHT facilities are not widely used in the UK for general waste and there are no general waste MHT plants currently operating in Scotland.

## What goes in?

**Non-recyclable waste (general waste)** from households and businesses



## What happens?



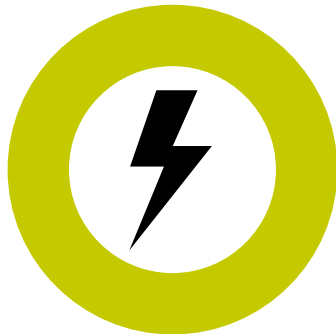
Material is delivered and shredded in preparation for treatment.

**Mechanical sorting:** removes some recyclables from non-recyclable waste (general waste).



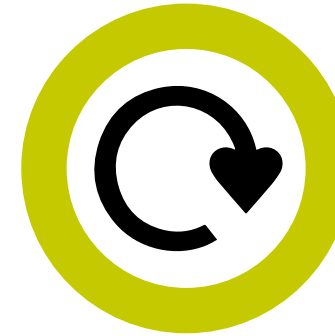
**MBT – Biological treatment:** uses naturally occurring microbes to break down the organic materials in the waste.

**MHT – Heat treatment:** uses pressure and heat to break down the material.



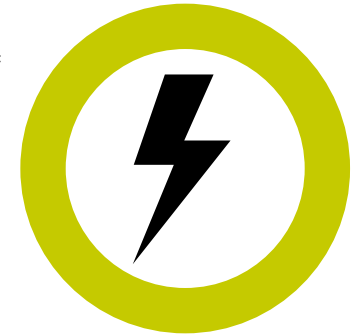
MHT produces a clean fibre for use as fuel in energy from waste plants. MBT produces biogas and a residue for disposal or use as a fuel in energy from waste.

## What comes out?



**Materials for recycling:** A range of different, segregated materials. These are sent for reprocessing where they will be turned into new products.

**Energy:** As the organic material breaks down in the anaerobic digestion phase of an MBT, a gas is produced (known as biogas). This is used to produce electricity which is then fed into the national grid to power homes and businesses. Where composting is used instead of AD, no energy is produced.



**Residue:** Both MBT and MHT produce a residue. From MBT, the remaining material is known as compost-like output (CLO). This does not meet the PAS100 composting standard and is therefore sent to energy from waste or disposal. MHT produces a clean fibre which can be sent to an energy from waste facility.

