



Breaking it down

Anaerobic Digestion



Freephone Helpline
0808 100 2040

zerowastescotland.org.uk

Overview

In Anaerobic Digestion (AD), food waste (and some other types of organic material) is broken down by a natural process. Unlike composting, the material breaks down in special, sealed containers without any oxygen.

AD is a faster process than both open air windrow composting and in-vessel composting. It only takes between 12- 30 days for the material to break down. The main output, known as digestate, can be used as a fertiliser as long as it meets a specific quality standard known as PAS110.

AD also creates a biological gas (biogas) which can be used as a biofuel or used to generate electricity and heat.

What goes in?

From households: **Food waste**

From businesses: **Food waste** (for example from restaurants, supermarkets) **and waste from food production** (for example manufacturers and fish processors)

Some sewage treatment plants also use AD systems. As with other AD systems, the resulting fertiliser from sewage AD facilities has to meet specific standards to be used on land.

Sewage is generally treated separately from food waste.

What happens?



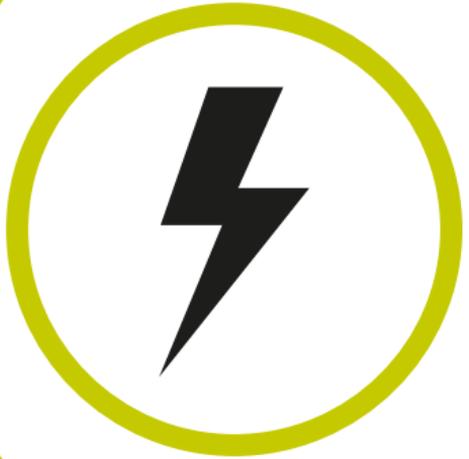
Material is delivered, sorted and prepared for treatment.

Prepared materials are put in a heated, enclosed, oxygen-free container.



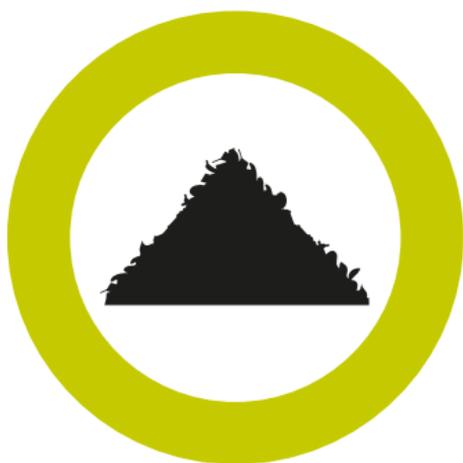
Microbes break down the material for around 12 – 30 days.

As the material breaks down, biogas is produced and this is used to produce energy.



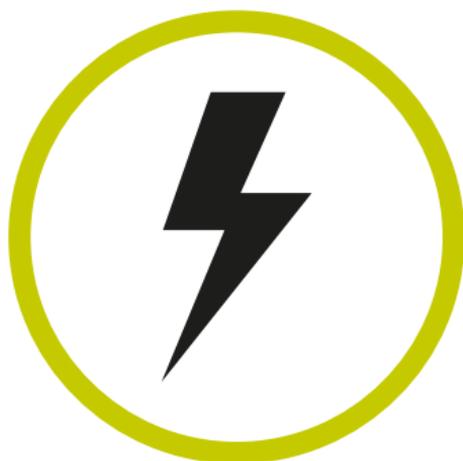
Once the process is complete, the leftover material can be used as fertiliser.

What comes out?



Digestate: This is a partially solid fertiliser created by AD. The digestate may be separated into its two constituents: fibre - which looks similar to compost and only makes up a very small proportion of the digestate; and 'liquor' which is the main, watery component. Digestate, liquor and fibre can all be applied to farmland provided they meet the necessary quality standard.

Biogas: As organic materials break down in AD, it produces a biogas. This gas can be fed into an engine to produce both heat and electricity or it can be put through a boiler and burned purely for heat. Alternatively, the biogas can be fed into the national grid and used by homes and businesses, or used as a vehicle fuel.



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.

Digestate

A fertiliser produced by anaerobic digestion. Digestate may be separated into: fibre - looks similar to compost; and 'liquor' - the main, watery constituent of digestate.

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.

Organic material

Natural material such as food waste and garden waste.

PAS110

A quality standard for anaerobic digestate. Non-PAS 110 digestate can be used on land however, it has to meet set requirements for an exemption. More details can be found on SEPA's website.

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

For more information on waste facilities and how they are developed, please visit: 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

Recycle for Scotland

For more information on how to reduce, re-use and recycle, please visit: www.recycleforscotland.com

Videos

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

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

Environmental Services Association

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



For more information about Zero Waste Scotland's terms and conditions, please visit www.zerowastescotland.org.uk/content/terms-conditions

If you have any questions please contact data@zerowastescotland.org.uk