

# Can Anaerobic Digestion technology help the UK to achieve net-zero by 2050?

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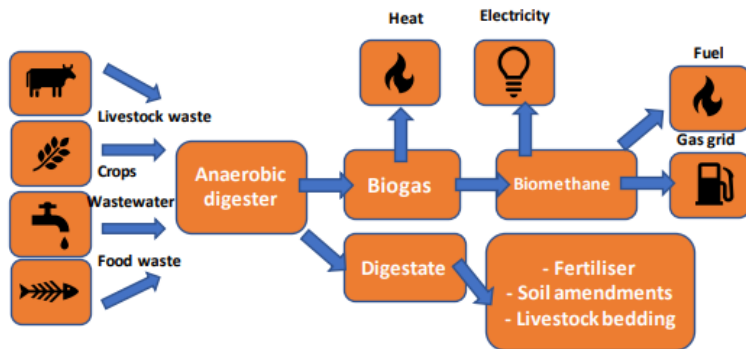
## Aims

- To demonstrate that recycling food waste via AD can help achieve net-zero by 2050
- To highlight policy recommendations which could overcome barriers to achieving a food waste collection scheme

Approximately **1.3 billion** tons of food is wasted per year (1). This produces **20 million** tons of CO<sub>2</sub> plus emissions in landfill (2). Recycling food waste via **anaerobic digestion** (AD) can help the UK achieve net-zero by 2050 whilst producing environmental, economic and political advantages. I conducted **interviews** with local councillors/organisations to investigate the barriers to achieving a food waste collection scheme.

## What is AD?

Anaerobic digestion is a process where specific microorganisms break down “organic matter [including food waste] under oxygen-free conditions” (3). It produces biogas and digestate which is used as a natural fertiliser. This process is undertaken within biogas plants. See below for diagram.



## Barriers to a food waste collection scheme

- Sufficient **funding**
- Compliance** by residents
- Will the **capacity** of biogas plants be reached? If not, economic losses
- Contamination** of food waste via improper recycling or microplastic contamination.
- Type of **food waste bags**. Paper may disintegrate, plastic is environmentally unsustainable, compostable bags difficult to distinguish from plastics, meaning the waste must be debagged.

Environmental benefits of AD	Economic benefits of AD	Political benefits of AD
Greenhouse gas emissions are reduced more than 200% (4) since: <ul style="list-style-type: none"> <li>- Biomethane is a renewable energy source</li> <li>- Less waste is going to landfill</li> </ul>	The byproducts can be sold as a constant source of revenue. This will eventually negate the costs to build new plants	Improving energy security
Reduction in use of synthetic fertilisers, improving soil quality	Creation of jobs to build and operate plants	Improving energy affordability
Reduction in usage of fossil fuels, slowing the impact of the climate emergency	Biomethane can be fed into the national grid to power homes and businesses	Contribution to UK's net-zero targets
Reduction in food waste	Less money spent on buying energy from other countries. More money to invest in local communities	Strengthening the UK's leadership on international climate action

## Conclusion/policy recommendations

Net-zero can be achieved quicker since greenhouse gas emissions are reduced more than **200%** (4), biomethane is a **renewable** energy source and **less** waste goes to landfill.

To overcome the aforementioned barriers, I recommend:

- Councils to **lobby** national government if funding is insufficient.
- Maintaining **dialogue** with councils who have **successfully** implemented collection schemes
- **Building** more biogas plants to increase capacity
- Providing a **roadmap** to achieving the national collection scheme
- Local and national **education** schemes
- Implementing schemes to **reduce** food waste
- **Fines** for any businesses who refuse to comply
- **Reducing** green bin collections to increase compliance

## Footnotes

- 1) FAO (Food and Agriculture Organization of the United Nations)(2011) Global Food Losses and Food Waste. FAO: Rome. Available at: [http://www.fao.org/fileadmin/user\\_upload/ags/](http://www.fao.org/fileadmin/user_upload/ags/)
- 2) Quesed, T., Parry, A., Easteal, S. and Swannell, R., (2011). Food and drink waste from households in the UK. *Nutrition Bulletin*, 36(4), pp.460-467.
- 3) Wilkie, A., (2005). "Anaerobic digestion: biology and benefits". *Dairy manure management: treatment, handling, and community relations*, pp.63-72.
- 4) European Biogas Association, n.d. *Avoided emissions from biogas and biomethane can lead to a negative carbon footprint* [online] Europeanbiogas.eu. Available at: <[https://www.europeanbiogas.eu/avoided-emissions-from-biogas-and-biomethane-can-lead-to-a-negative-carbon-footprint/#\\_ftn2](https://www.europeanbiogas.eu/avoided-emissions-from-biogas-and-biomethane-can-lead-to-a-negative-carbon-footprint/#_ftn2)> [Accessed 25 August 2022].