Outputs from Anaerobic Digestion

Briefing Note: BN 13

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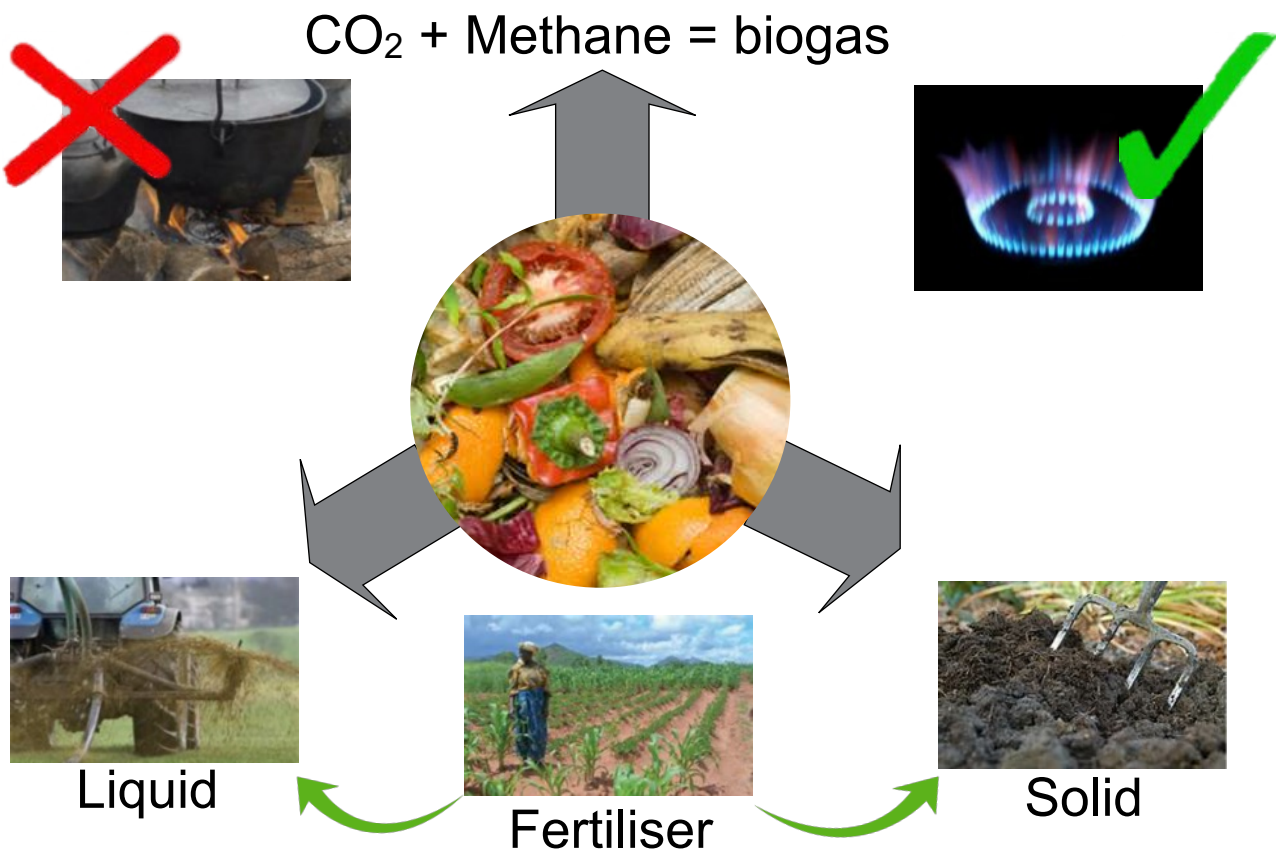
The anaerobic digestion process (AD) takes waste material that would otherwise cause unsanitary conditions and makes useful products. It makes a gas which can be burnt as a fuel, liquid rich in plant nutrients and a sludge which is also a bio-fertiliser.



When organic waste such as food waste, human excrement and animal manures are decomposed in an anaerobic digester they make three end products: biogas, liquid fertiliser and sludge.

The biogas produced is predominantly methane and carbon dioxide which can be burnt directly as a fuel for cooking or other uses. The amount of biogas which can be generated is dependant on a number of factors. However, when processing under optimal conditions a Flexigester$_{10}$ AD system could be expected to produce over 7m^3 of biogas per day. The calorific value of this biogas is approximately equivalent 17 kg of green wood per day (or 8kg dry wood).

The liquid fraction produced is rich in nutrients which can be applied to fields to give water and nutrients to growing crops. The containment of the waste whilst it is decomposing limits evaporation so precious water is conserved. Similarly, the nutrient chemicals in the waste are broken down by the digestion process so that the material is more suitable for use as a fertiliser. The liquids contain some of the nutrients and the solids also. Typical nutrients levels found in digestate are:

Total nitrogen	5.2 kg/m^3
NH_4-Nitrogen	3.4 kg/m^3
Phosphate (P_2O_5)	2.5 kg/m^3
Potassium (K_2O)	4.2 kg/m^3

There can also be a solid fraction. This also contains nutrients and can be applied to agricultural land. How much sludge is produced is dependent on the input wastes. The design of the digester encourages the retention of the solids. This means that they continue to breakdown and produce gas. It also means that the amount of solids is also reduced and the nutrients within the sludge concentrated.

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