

Fact Sheet 9: Biogas and Anaerobic Digestion



Farm-scale anaerobic digestion plant

What are they?

A system of covered tanks or silos and a generator unit. The smallest commercial Anaerobic Digestion (AD) plants are too big for single domestic houses; they are suitable for farms. A farm-scale AD plant can take up the same space as a couple of out-buildings, although some designs can be buried underground.

What do they do?

AD plants produce a flammable mixture of gases known as “biogas”, which is mainly methane. This gas can fuel a specialised generator to produce electricity.

Alternatively, the biogas can be purified or ‘scrubbed’ to remove the non-flammable gases, and sold to the gas grid. Purified biogas is methane, and is identical to the gas supplied by the grid.

The waste liquid product from an AD plant is rich in nitrogen and can be used as a fertiliser.

How do they work?

The AD plant contains a large airtight tank(s). Farm waste, such as manure, is fed into the tank and left for a while to decompose. The airtight tank prevents oxygen from entering. Without oxygen the manure cannot decompose completely, and biogas is produced instead.

The process of decomposition or ‘digestion’ leaves a small amount of waste or spent ‘digestate’ after it has finished. Conventional nitrogen fertiliser is expensive and requires a lot of fossil fuels to produce. The waste product from an AD plant can be used to replace conventional nitrogen fertilisers in agriculture. Small anaerobic digesters are eligible for the Feed-in Tariff scheme.

Where do they go?

Due to their size, an AD plant needs to be an independent development, rather than installed in an existing building. A farm is the typical location for a small-scale plant, as it produces plenty of decomposable waste that can be used as fuel for the AD plant.

Larger scale AD plants can process the waste from several farms, as well as taking other forms of biological waste such as sewage, abattoir waste and food waste.

What issues need to be considered?

Due to the nature of the materials used in AD plants, there is the potential for bad smells. While the AD process itself is air-tight, the storage of waste before it enters the process needs to be tightly controlled to prevent these smells.

If an AD plant receives waste from off-site, it needs a waste processing licence. Consideration should also be given to transport routes and frequency of deliveries to the site.

What are the planning requirements?

Planning consent is likely to be required for all anaerobic digestion plant installations, and it is advisable to consult with the local planning authority at an early stage.

AD facilities tend to be located in rural locations and usually require new buildings to house the digester equipment and the ancillary infrastructure. A new site access may also be required. When assessing the planning application, the local planning authority will consider a number of planning issues, including:

- Site selection, visual intrusion, transport and traffic movement.
- Feedstocks and product storage.
- Odour, emissions to air, ground and watercourses.
- The positive benefit of the plant to the local economy.

The planning requirements for AD plants will vary depending on the size of the installation; smaller on-farm AD plants often form part of onsite waste management procedures and will be treated as an agricultural application, whereas much larger AD plants, which are designed specifically for energy generation, will be more similar to an industrial process and much more supporting information and assessments will be required.

Please note; AD plants may also be subject to environmental permits.

More Info

This website is the official information portal for those interested in AD and biogas. This site is produced by the NNFCC for Defra: <http://www.biogas-info.co.uk/>

The companion guide to planning policy statement 22 provides more information on the planning and development of renewable energy schemes across England: <http://www.communities.gov.uk/publications/planningandbuilding/planningrenewable>

Please Note: National planning guidance is currently under review and the companion guide to planning policy statement 22 is referred to for information only.