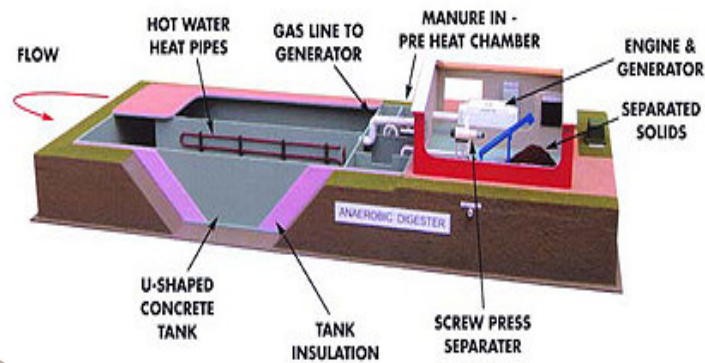


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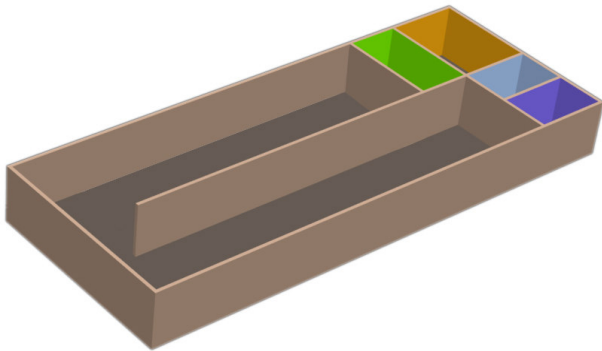
Anaerobic Digesters (AD)

But what exactly is anaerobic digestion? Anaerobic digestion is a natural process where organic matter is converted to energy by micro biological organisms when oxygen is absent.

The benefits are quite obvious with cows accounting for a large proportion of the source of greenhouse gasses!!



A Typical Anaerobic Digester Plant Layout



Underground Concrete, Lightweight GRP or Steel Box Construction



A Typical 300kW underground Anaerobic Digester Plant
Picture:- Courtesy GHD Inc.

New developments in the affordability and the size of anaerobic digester plants are being made every day making the possibility of installing this technology more attainable.

A 'biogas' is discharged: a mixture of methane and carbon dioxide. This can be used for heating and/or electrical production or the gas can be cleaned and injected into the local gas mains. The remaining parts are: liquid and solids.

The liquid may be used as a fertiliser and the solids, in a fibrous form, can be used as a nutrient - 'rich soil conditioner'.

Solids are also used as cow bedding and as a base material for natural fibre boards and building materials as the resultant solid is totally clean.

There are over 50 underground hidden Digester Plants operating in the USA. These, like the photograph opposite, offer a visually unobtrusive solution to Anaerobic Digestion when compared to the more common above ground installations.

Traditionally, anaerobic digestion has not been an attractive process in the UK especially to the farming community because of perceived technical problems; problems of operation; lack of appropriate technical support; and above all it has been quite simply, unviable economically.

However here at GPJ Consulting Engineers we are constantly looking at different products and have seen AD plants already up and running in the United States operating to remarkably good effect.

We are actively involved in working with manufacturers of these systems to try and adapt them for the smaller European markets, thus trying to make them more affordable.

Sustainability—Anaerobic Digesters

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GPJ Consulting Engineers are actively promoting the technology and as such believe this to be a technically and visually superior anaerobic digester suited to the European market.

We are promoting a small scale anaerobic digesting unit that may be built off site using modern lightweight materials for “plug & play” applications for smaller consumers.

The designers GHD have successfully built and commissioned over 50 mixed plug flow anaerobic digesters in the United States. These plants range from approximately 100kW to 3MW. Anaerobic digester technology developed and proven in the United States has also greatly simplified the engineering of AD plant and hidden below ground units have removed the eyesore of large methane storage tanks.

In addition to this, action through DEFRA promoting grants to assist with capital costs and capital allowances in the tax regime, together with the value of the energy produced have encouraged financial viability.



Phase 1 Construction of a safe sealed underground mixed plug flow digester. Hidden from view.

Picture:- Courtesy GHD Inc.



Phase 2 Construct an above or below ground plant space comprising the electrical generator and heat distribution plant.

Picture:- Courtesy GHD Inc.



Phase 3 Sell electricity and useful process heat and by-products such as compost and liquid waste streams to be used as a fertiliser.

Picture:- Courtesy GHD Inc.

There is obviously an advantage to implementing this technique on sites in the UK – The simplicity of this technology is that any organic waste can be used. This would include food waste as well as animal waste and all could be then converted into useful energy with no harmful by-product.

Over the last few years, there has been much discussion within the water and environment industry on the beneficial use of anaerobic digestion as a renewable energy source for heat and power but also its environmental benefits by keeping organic waste out of landfill and thereby reducing greenhouse gas emissions.

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