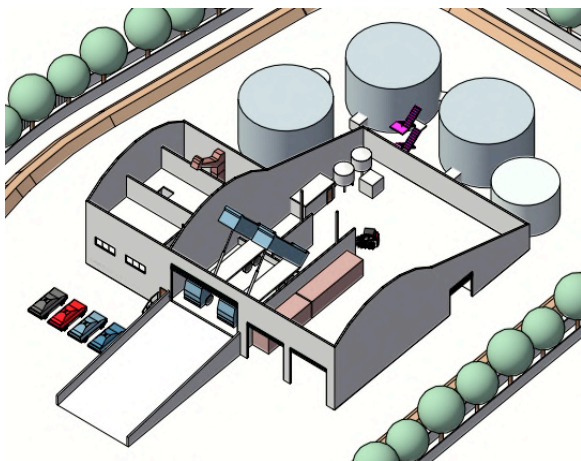


## Farm-based Anaerobic Digesters

Landfill disposal of food and other biodegradable waste will no longer be viable following recent legislation. EOS Future Design can provide a more sustainable alternative to landfill that is in compliance with all relevant legislation and which will support farmers and increased food production.

Several Anaerobic Digestion Plants are being developed in the midlands for the treatment of agricultural waste and other biodegradable waste streams. The waste will generate biogas and pasteurized fertilizer and soil conditioner.



The plants will include a de-packaging and pulping line and will have Department of Agriculture permits to accept Category 2 & 3 Animal By-products such as catering waste and domestic brown bin waste.

Anaerobic digestion is a proven technology and has been successfully used for many decades to stabilize agricultural waste and organic municipal solid wastes and to generate biogas and fertilizer. There are over 6,000 ADs in Germany generating 3.5% of the country's electricity.

## Why Farm-based Anaerobic Digestion

Farm-based ADs will co-digest food waste with animal slurry. Slurry contains the necessary microorganisms for the digestion process, providing buffering capacity to stabilize the process and balancing the nutrient content of the end product. This means farm based ADs are more robust, operating more of the time with more consistent digestate quality.

The digestion of cattle slurry improves its fertilizer properties by making its nutrients more available to crops. Digestion of slurry reduces the volatility of Nitrogen and is especially effective in reducing phosphorous run-off to waterbodies as compared to slurry spreading. The digestate end product can be separated into a dry fibre and a liquid - the fibre contains most of the Phosphorous while the liquid retains the majority of Nitrogen. Phosphorous, which is in excess of safe limits in the soils and rivers of many regions, can then be exported to areas which are in deficit.

The digestion of slurry adds a barrier to the spread of animal diseases especially when the digestate is

pasteurised. The process kills pathogens, weed seeds and other biological hazards and prevents disease transmission through land application. AD of slurry can also make a major contribution to GHG emissions reduction targets by eliminating methane emissions from stored slurry and reducing nitrous oxide emissions from artificial fertilizers and fossil fuel substitution.

### Benefits to agriculture.

From the production of feedstock to the application of digestate as fertiliser, the AD is an essential link in closing the nutrient and carbon cycles. Some carbon compounds remain in the digestate to improve the carbon content of soils when it is applied as fertiliser. Digestate can replace chemical fertilisers, which are fossil fuel intensive. A medium sized farm can save approximately €5,000 per annum just by putting slurry through an AD before it is spread on the land.. The biogas from the process can be used for electricity or heat or both or once, upgraded, for transport. Surplus heat can heat water for the dairy, provide heat to other farm buildings, farm house, poly tunnel and grain or wood-chip drying. In this way biogas production can be fully integrated into the agricultural economy.

### What waste can a farm-based AD treat?

- **Agricultural wastes** including manure, slurry, spoiled crops, silage, etc.
- **Food processing residues**, former foodstuffs, dairy waste, sludges from on-site wastewater treatment.
- **Out of date retail food items** including packaged items, drinks or sauces in plastic containers, milk-based products; egg products.
- **Organic fraction of municipal solid waste**
- **Biodegradable kitchen and canteen waste.**
- **Sewage sludge.**
- **Digestive tract content.**

All waste must be free of any chemicals or detergents which could inhibit the microbiological activity. Waste must be delivered in sealed covered containers or trailers. Liquid waste will be pumped from vacuum tanks.






EOS Future Design is now seeking expressions of interest from farmers, investors and potential operators as well as waste collectors and waste generators such, food factories, retailers, hotels, etc.

## Hub & Satellite Structure

In this model food waste is pulped and pasteurised at a central location using heat from an AD. A portion of this is co-digested on site and the remainder transported to several smaller farm-based ADs where it is co-digested with slurry. The Satellite ADs will co-digest this with slurry collected from housed animals within a range of 5 km.

## Legend

-  Farm with approx 100 cows
-  Hub AD & Pretreatment plant
-  Satellite AD

