



Question and answer session (summarised) from anaerobic digestion talk Friday 24 June 2011

Anaerobic digestion (AD) technology – how it works

Q: How do you separate food stuffs from packaging [at the start of the AD process]?

A: You use a variety of methods: bag splitters, knives, methods which separate items according to density and weights such as floating, spinning, etc.

Q: How efficient is the sorting system in getting rid of the plastics?

A: Generally 2-3% of the original plastics remain, and these can then be cleaned up at the back end of the process, i.e. where the residual organic fibre is screened.

Q: How refined can the end products become?

A: It depends on how much is spent on this process. It can be as high as 99% organic fraction.

Q: Would the remaining 1% of plastics in compost have an effect in agriculture?

A: It depends on what you need and the usability/purpose of the compost/fibre.

Q: How do you minimise odour using AD technology?

A: You use a tipping hall, where waste is tipped inside a large shed and controlled systems such as air filtering are also used. It is vital to keep the waste inside.

Q: In the UK is the digestate considered inert waste? Or does it have to go to a putrescible landfill?

A: It depends on the permit system, how high temperatures are in the process, and what kind of waste is being processed in the plant.

Q: Which are more efficient – steel or concrete tanks?

A: Concrete lasts longer, but is much dearer. Some concrete tanks in the UK have lasted up to 50-60 years. Glass lined steel is cheaper and more common.

Q: Is there a rule of thumb regarding the importing of water for technologies?

A: It depends on the moisture content. Some processes require a discharging of leachate if the feedstock is 'wet'. In some you add water. For MSW [municipal waste] the AD process would be unlikely to require water.

Health, environment and safety

Q: Are you aware of where compost from AD plants are going onto edible food crops?

A: In China and Brazil. Generally it is not recommended.

Q: What about going down the path of California, where people are encouraged to compost individually?

A: I wouldn't recommend it for the long-term. The turning of compost releases spores which can be harmful to human health (volatile organic compounds), and in doing large-scale aerobic composting, around 20% of energy is released in turning windrows.



Q: There has been very little discussed about sustainability. What are your views on burning methane gas (via AD) rather than returning carbon to the ground via compost? And what about the embedded energy cost of the AD process versus aerobic composting?

A: Composting puts carbon into the ground temporarily where it can be taken up by plants but a lot is lost as CO₂. But the composting process also emits volatile organic compounds, CO₂ and methane.

Q: What contaminants in the waste would have a final result that wouldn't allow compost to be used on a vegetable farm?

A: It depends on the source of the feedstock. E.g. if batteries were in the feedstock this wouldn't be used including heavy metals and some chlorines and chlorides from plastics.

Q: How is the quality of compost (or soil conditioner) checked to ensure that it is safe and usable for its different purposes (i.e. so there isn't any fear about heavy metal contamination etc)?

A. Analysis in a laboratory for compliance to local standards.

Additional questions put to Gerald Tetchner after the presentation:

Q: Are any of the 'outputs' from the AD process (e.g. particulates in the atmosphere and the waste water) potentially hazardous to human health?

A: If a material is composted in open atmosphere, spores and volatile organic compounds can be released from the process but if the material has previously been digested and heated high enough to kill off any spores the endangerment to human health is greatly reduced except for potential dust when workers are handling the material which can be offset by wearing dust filter masks.

Q: What is the risk of fire or similar catastrophic events using this process, where methane gas is an output? Have there ever been any serious accidents to your knowledge?

A: To date the writer is unaware of any fires within the digestion process as the moisture content is far too high and the concentration of methane exceeds the upper and lower limits for risk of explosion/fire. The only accidents the writer is aware of is where construction or maintenance personnel have not adhered to safety regulations when entering the confined space of the digester. This will normally not occur as long as confined space safeguards and regulations are adhered to.

General questions

Q: EMRC has said that they would consider a third bin if AD were chosen as the preferred technology. Has a third bin worked in your experience?

A: In low income/lower socio-economic areas it hasn't worked as well. In the European Union bin separation has worked well for many years. In the UK it's not proving as popular. Many people are using them under protest because of space restrictions for the third bin and the odour they can cause in councils where bins are picked up every fortnight.



Q: Is the EMRC aware of other AD plants locally or around the world?

A: There are AD plants all around the world. In Australia, there are four AD plants – one is being constructed at Shenton Park (to service the Western Metropolitan Regional Council); Eastern Creek, Sydney; Camelia in Sydney (commercial food waste) and the Arrow Bio Plant (food waste but not green waste) at Jack's Gully, NSW.

Q: Could you dig the AD tanks below ground?

A: It's technically feasible, but from a chemical engineering/process control point of view you would lose a few features. In Australia the temperature variability is too great (and smell can't always be controlled).

Q: There has been an emphasis on waste to energy. Can the organics be converted to animal food?

A: It's less likely and not recommended.

Q: Is it possible to make AD more efficient by combining MSW and sewage?

A: It's best to have a single feedstock. If different feedstocks are mixed together then complicated biochemical processes are involved. But it is possible to optimise processes once the feedstock has been established but end products are still classed as waste.

Q: Why hasn't EMRC considered having an AD plant at sports ovals and use reclaimed landfill land?

A: EMRC has looked at all available options in the region, and considered factors such as waste receipt, waste preparation area, traffic demands and buffer zones for waste receipt. Red Hill was determined as the best location.

Additional questions put to Gerald Tetchner after presentation

Q: Instead of having a third bin system, why don't we consider having a 'garburator' where food goes down into a separate outlet? Especially for new suburbs?

A: No response provided by Mr Tetchner. EMRC officers have seen a vacuum collection system used in Tokyo but the operators said it was very expensive and they would not recommend it.

Q: Where is a good source of information so that I can find out, in layman terms, what anaerobic digestion is and some examples of it in use?

A: Google or Wikipedia is the best place to look.