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Gemidan Ecogi assesses solutions to plastic contamination in AD feedstocks



Plastic waste remains high on the public agenda which in turn generates much debate and anxiety within the waste and renewable energy sectors.

For Anaerobic Digestion operators who process food waste there seems to be 3 main solutions to address plastic contamination in feedstocks –

- Invest in new, more effective technologies, that deliver contamination free substrate/digestate;
- React to any new tighter regulation as it is introduced;
- Rely on rejecting contaminated feedstock consignments to pressure 'up stream' suppliers to reduce contamination through improved separation at source.

In a recent feature Jeremy Jacobs, technical director of the Renewable Energy Association (REA) expressed the opinion concerning AD operators that *'Many are accepting packaged food waste which they have to in turn de-package. The challenge for them is ensuring that their clean up technologies are effective at removing the plastics prior to their subsequent spreading to land'*.

Jeremy seems to be suggesting that better performing technology may well be the answer.

Undoubtedly, there are now new high-performance technologies available that have proven to remove virtually all (99.9%) of plastic and other contamination from food waste feedstocks. Some technologies can maintain this performance even when contamination levels, across all material contaminants, rise above 20%.



Most would agree that removing physical contamination is best done prior to AD processing i.e. during feedstock pre-treatment. Once removed contamination ceases to put at risk equipment downstream and ensures the final purity of digestate.



The most effective way to remove contamination, especially plastic, is by keeping materials as whole as possible i.e. macroplastic. The logic being once materials become fragmented it is much harder to remove and potentially adds to the rising problem known as microplastic pollution in soils and the wider environment.

The initial investment for higher performing technologies may be higher. However, having made the investment, the problem is solved. The ability to deal with more challenging feedstocks can increase gate fee revenues. Producing a better quality, less contaminated digestate will also help sell more digestate.

In Denmark the government have recently introduced new legislation to address problems associated with contamination in feedstock. In the UK PAS 110 concentrates on contamination in digestate. The recently introduced Danish regulations set limits for the physical contamination found in substrate.

The Danish Ministry of the Environment and Food have implemented a 'Decree on the use of waste for agricultural purposes (Journal Number: Environment and Ministry for Food 2018-695). These new regulations apply only to substrates made from waste derived feedstocks and when, following biogas production, will become digestate fertilizers for use on farmland.

Firstly, weight limits are placed on all physical contaminants (plastic, glass and composite materials > 2mm) found in substrate to 0.5% by weight / Dry Matter. Plastic is subject to an additional specific limit '*The limit value for plastic content of substrate, greater than 2mm, is 0.15% by weight / dry matter or 1 cm²/1% of dry matter measured in 1 liter of biopulp.*'

Will the UK Government decide to implement tighter regulation to address plastic contamination in the UK? Michael Gove, the UK Secretary of State for Environment,

Food and Rural Affairs, is already involved in the media debate over plastic waste. The risk of more stringent regulation must surely rise as public pressure continues to grow.

Some industry pundits suggest that by rejecting contaminated feedstock food waste collectors / feedstock suppliers will be pressurized to improve quality through better separation at source. It is also suggested that regulators could help facilitate this approach by making feedstock quality part of the waste acceptance requirements of the Environmental Permitting regime.

Currently the supply and demand for food waste feedstock is so finely balanced that operators may well be reluctant to be so insistent with their demands for improvements to feedstock quality. Many operators are mindful of the commercial reality that if they turn feedstock away other operators may step in to 'poach' tonnage.

Less than 50% of local authorities in England collect food waste, less if you take out mixed collections of garden and food waste. DEFRA officers working on the waste strategy recently made it clear to REA's Organics Recycling Group that '*mandatory food waste only collections are "unlikely" because of the cost burdens they would mean for councils*'

Unlike the devolved administrations England remains without legislation or effective policy drivers to help develop domestic or commercial food waste collections.



While this situation prevails AD operators may have to rely on less radical efforts to encourage and educate feedstock suppliers to address the issue of contamination.

To address the plastic contamination in feedstock should AD operators bite the bullet and buy improved technologies or get tough with their feedstock suppliers or simply wait until the Government introduces new regulation?