Biobased packaging and the organics recycling industry

'Home composting is not an effective or environmentally beneficial waste processing method for biodegradable or compostable packaging in the UK'. This is the conclusion of a recent study from UCL, which is sending ripples across the compostable plastics and packaging industry.

The study engaged with citizens in the UK to test the performance of some home compostable materials. The report points to confusion among the public about labelling, as some of the materials used were labelled as 'industrially compostable' or had no certification at all. As a result, unsurprisingly, not all of the materials composted in the public's home composting systems and inevitably is now causing distrust and apprehension across the whole composting sector. Several companies have already chosen to move away from compostable materials, such as Abel and Cole opting to remove compostable packaging in their fruit and veg boxes. Even the UK environment minister says that government support is better suited to recycling or reusable plastics instead of compostable.

Types of composting

Effective communication and certification can go some way to resolving these issues. It's important to remember that biodegradability and compostability relies heavily on the environment where the product is broken down. Something labelled as biodegradable, or indeed compostable, is a meaningless descriptor without specifying the environment, conditions and time-frame. Certified compostable materials are generally labelled as 'home compostable' or 'industrially compostable', from organisation such as TUV Austria.

Certification for compostables

Materials certified as home compostable are those which are intended to decompose in a home composting bin and will decompose sufficiently in this environment after a certain amount of time. This is a slower process with no specific temperature controls.

Industrial composting can refer to open windrow or in-vessel composting. Open windrow composting, as the name suggests, is an open-air process that places compostable material into long, 5ft high piles called "windrows", but this is more suited to garden waste. In-vessel composting (IVC), on the other hand, is a process that takes place in an enclosed environment, which allows for specific conditions of temperature (between 55 to 60°C), moisture and retention time.

Certified industrially compostable materials are those which are suitable for processing in an industrial composting facility. Certification can be achieved when material conforms to the following standards.

- BS EN 13432–Packaging: Requirements for packaging recoverable through composting and biodegradation;
- BS EN 14995–Plastics: Evaluation of compostability

These regulations state that in order for a material to comply with this standard, packaging must disintegrate by 90% within 3 months, and biodegrade by 90% within 6 months under aerobic conditions (there is also a requirement for under anaerobic conditions). Certified compostable products will either display a 7P####code (DIN CERTCO) or a S###code (Vinçotte) alongside their respective certification

marks. These are certification bodies that are experienced in assessing compliance with standard EN 13432, for compostable packaging.

Current UK infrastructure

For compostable plastics to be used as designed, there needs to be an understanding of the UK's waste management system and how they can fit into it, or how the system can be better adapted to compostables.

Aside from confusion over what is appropriate to go into home compost, use of home compostable materials assumes that everyone has access to a compost bin, when in reality there is only a small proportion of the public that have their own or have access to a compost bin. As for industrially compostable material, adequate composting also isn't guaranteed. They have to be collected and sent to a composting facility where they can be co-mingled with food and garden waste.

It's estimated that there are 272 composting sites in the UK, of those 50 are IVC sites. In addition, in September 2022, the REA collected data on composting sites in the UK and found that there are 24 sites which are CCS certified composting processes, willing to accept certified compostables. The infrastructure is there for them to be organically recycled as intended, but effective collection remains an issue for this waste stream and a 'compostable plastics'-specific waste stream is an unlikely solution.

Contamination of composting streams

There can be a negative perception from the composting industry to these plastics. For those producing a PAS100 compost (commercial compost standard of quality), remaining compliant with the standard dictates what they can and can't accept, to mitigate the risk of contamination with non-compostable materials in the end product.

Without careful waste management, non-compostable packaging can work its way into the process and, although some sites have screening post-treatment, for some sites it is this non-compostable contamination issue that causes the scepticism. In such circumstances, food service packaging arising from closed events is the preferable source material, as there is less risk of contamination with other materials. The risk is reduced further if waste is collected, sorted and disposed of at closed events by event staff who have been suitably trained. In addition, a careful balance has to be maintained between compostable packaging and other materials like green waste. For this reason, some sites will have an upper limit on the volumes of compostable packaging they can take.

There can also be practical barriers to effective composting of compostable plastics. Some sites have de-packaging units in operation prior to composting, and the removed packaging can be sent to such as energy recovery, compostable and non-compostable alike. In addition, not all composting sites can be automatically assumed suitable for compostable plastics. Process parameters such as retention time can vary and not be compatible with the requirements for compostable packaging to decompose. This demonstrates some of the difficulties the industry has had in identifying disposal routes.

It is important to bear in mind that a number of sites are simply not interested in accepting compostable waste, but it is possible for this to change in the future. It is possible that some of these sites are both legally and technically able to process compostable food packaging waste, but don't want to bother with it because they don't know what it is, they see too much risk associated with accepting it, or they don't want the hassle they presume it brings. All of these concerns could be addressed with clear communication, demonstration and a building of trust and confidence with processors and the wider industry.

Current best use of compostables

So, based on the current barriers, what is the best use of compostable plastics? Most likely, this is in with food waste. Besides, organic recycling legislation appears to be heading that way. Food waste collection by local council will be mandatory in England next year and compostable bags that can be treated alongside food waste is the most logical solution, as having no bin liners is likely to drastically reduce public participation and having such as polyethylene bags will send the wrong message to the public.

The latest guidance from WRAP on compostable packaging aims to reduce the confusion. Taking into account the current infrastructure in the UK for waste management, it provides decision making guidance for potential users of compostables. It also highlights six key applications for compostable plastic packaging:

- Food caddy liners
- Fruit and veg stickers
- Tea bags
- Coffee pods
- Ready meal trays
- Closed loop situations like at festivals or within buildings like coffee shops

Again, these are recommendations that point towards food waste, where the compostable material is organically recycled alongside, or where the material is at no risk of being contaminated or contaminating other waste streams and can be composted as intended. Guidance remains positive towards the inclusion of compostable plastics in UK waste management.

While it's true that the use of compostables is not optimised in the UK, a big part of the issue is in people's understanding of compostable materials and where they end up, which can be mitigated. Care has to be taken for them to actually make it to the composting stage and consider whether it's the best material for that particular application. Otherwise, compostable materials are used inappropriately, which is detrimental to the whole industry.

The composting industry is growing, and will continue to play an important part in the UK's sustainable management of waste, including compostable plastics. NNFCC regularly monitors the composting market in the UK and maintains a database on active sites, with key information on their operations. A comprehensive report on the composting industry will be released alongside our annual anaerobic digestion report in April 2023.

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