



## **BBIA response to the DEFRA consultation on consistency in household and business recycling collections in England**

### **a. Introduction**

The BBIA represents UK and non UK manufacturers and distributors of products, chemicals and materials that have a common identity in their sourcing (partially or totally bio-based which means derived from plants) and in their end-of-waste performance (biodegradable or compostable in various environments which could be natural – in the case of biolubricants - or in industrial composting, in the case of packaging).

The BBIA was established by 7 founder members in June 2015 and in 2019 comprises 23 companies which produce biopolymers for onward conversion into products; building blocks for the chemical industry from bio-based sources that may be used in pharma, cosmetics, paints and coatings, as well as lubricants, packaging, pesticides; members also distribute and sell products in the UK market; and include associations, consultants and the Scottish IBIOIC. BBIA members represent most of the value chain in the production, conversion and treatment of compostable packaging materials.

BBIA is also a partner in 2 EU funded research projects: under the Horizon 2020 grant for the Res Urbis project which researches into producing compostable materials using food waste as a feedstock, ending in December 2019; and in the BBI JU funding grant for Usable Packaging, a research project beginning in June 2019 for three years researching into producing compostable materials from industrial food waste such as from bakeries, wineries, pasta producers. More details about the BBIA can be found on [www.bbia.org.uk](http://www.bbia.org.uk) including reports and research undertaken on compostable packaging.

BBIA members' activities can be understood in the wider context of the Bioeconomy. The UK strategy on Bioeconomy<sup>1</sup> published in December 2018 indicates that the UK bioeconomy currently has a value of £220bn annually and employs some 5 million people directly and indirectly- including in farming. One of the four pillars of the UK strategy is to “Create the right societal and market conditions to allow innovative bio-based products and services to thrive” and includes plastic pollution as one of the societal challenges humanity faces.

The wider context of bioeconomy leads us to the specifics discussed in the DEFRA consultation on waste collections consistency, the significance of biowaste as a feedstock for the UK bioeconomy, and the need to ensure the correct management of biowaste to create wider societal benefits, including those relating to climate change, food production, plastics pollution, resource recovery, economic prosperity and secure employment in the UK itself.

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[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/761856/181205\\_BEIS\\_Growing\\_the\\_Bioeconomy\\_Web\\_SP\\_.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/761856/181205_BEIS_Growing_the_Bioeconomy_Web_SP_.pdf)

BBIA believes that innovative compostable materials produced by its members are critical to the transformation of the way in which we collect and treat food waste and to the reduction of certain types of plastic packaging waste.

What are compostable materials? They are those products whose end-of-life is destined to be biodegradation in industrial composting plants. They can be films or rigid materials which in certain uses (see below) can substitute some plastics and ensure the recycling of these through industrial composting, or organic recycling. This includes wet anaerobic digestion when this has a post digestion aerobic phase or is a “dry” process allowing recovery of packaging, common in Europe and to be found in the UK too. The biodegradation process enables appropriately designed materials to biodegrade into the soil or compost material. This has valuable nutritional content for application to soil, including precious organic carbon that improves soil fertility and long term sustainability of soils.

It is important to note that **only** compostable packaging materials adhering to the BS EN13432 standard can be considered “biodegradable” as biodegradable in the context of the Waste Framework Directive 2008/92, the Packaging and Packaging Waste Directive 96/82 and the Essential Requirements, all as implemented in the UK and additionally the Directive on Single Use Plastics (article 3, 16). Packaging materials adhering to the BS EN13432 standard demonstrate conformity with the Essential Requirements and UK end of waste criteria when organically recovered through composting and Anaerobic Digestion into compost or digestate produced to the PAS 100/110 standards and where relevant the Quality Protocols are respected.<sup>2</sup> Organic recovery is, according to the cited Regulations, recycling.

Compostable materials are subject to standards not only on biodegradability but also toxicity which other packaging materials are generally not subject to. Compostables have to be able to prove they are benign for the compost they help produce, for the soils they are spread upon, for plant life as well have all the pre-requisite REACH and food contact approvals. Non compostable packaging, for example, is not subjected to such stringent and costly toxicity testing or the need to prove lack of environmental harm from their use, reuse or recovery including recycling.

The optimal destination of food contaminated compostable packaging materials is to end its life in composting and be recycled into soil improvers (fertilisers) recognised under UK law as those meeting the PAS100 standard<sup>3</sup> or as digestate if derived from AD (PAS110).<sup>4</sup> In the next weeks the revised European Fertiliser Regulation will be issued and a new Regulation will enter into force which recognises UK PAS100/110 standards as End of Waste standards for separately collected biowaste treated in composting and anaerobic digestion.

BBIA members adhere to strict recognition of the internationally recognised standards and do not market packaging materials with a generic “biodegradable” label.

#### **b. The case for collecting biowaste separately from residual waste**

BBIA agrees with the need for separate biowaste (food and garden) collections as outlined in the consultation documents. As promoters of the Food Waste Coalition with 50 signatories, we welcome

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<sup>2</sup> Organics Recycling, 2011: <http://www.organics-recycling.org.uk/uploads/article1983/EN%2013432%20Compostable%20Products%20and%20Packaging.pdf>

<sup>3</sup> Quality Compost: <http://www.qualitycompost.org.uk/standards/pas100>

<sup>4</sup> WRAP: <http://www.wrap.org.uk/content/bsi-pas-110-specification-digestate>

the Government's determination to "end the scandal of food waste "as stated by Minister Michael Gove.<sup>5</sup>

There are several reasons why we believe that biowaste collections should be mandatory across England for households and businesses handling food, and these are:

1. Improved overall resource efficiency. By removing food waste from other waste streams these become easier to recycle. Food is wet, sticky and odorous and when it contaminates paper, plastics and aluminium or glass, these become more costly and difficult to recover.
2. Improved energy production. Using biowaste to generate biogas through anaerobic digestion is an efficient instrument to provide renewable heat and electricity as well as zero carbon fuel (biomethane) for transport. The use of biogas in different contexts and as flexible fuel source through recovery of food waste is already established in the UK and technologies are mature; its use for mixed garden and food wastes is long proven in mainland Europe and is emerging in the UK context. The UK commitment to achieve the EU 20/20/20 target (20% energy efficiency, 20% renewable energy, 20% transport fuel from renewables) is still not on target-with the UK destined to reach 17% renewable energy by 2020.<sup>6</sup> Biogas can help meet that target.
3. Reduced GHG emissions from food waste fermenting in landfills or being burnt in incinerators. Given the urgency that all nations have to reduce their GHG footprints and the UK Government commitments to the Paris accords and the UN Sustainable Development Goals, we recall the targets which foresee a reduction in greenhouse gas emissions of at least 80% by the year 2050, relative to 1990 levels. Food waste collections will "reduce GHG emissions by an estimated 1.25 million tonnes a year" according to the Impact Assessment of this consultation. The importance of the reduction of biowaste to disposal was underlined in May's Committee on Climate Change report, Net Zero 2050 which stated that "current policy is insufficient for even the existing targets."<sup>7</sup>
4. Help to achieve the adopted target of 65% overall recovery of MSW by 2035. Food waste constitutes the most significant fraction of MSW and a considerable segment of business waste (especially those preparing and handling food stuffs) and by separately collecting and treating these England can raise its overall recycling rates by at least 5% according the Impact Assessment of this consultation. We believe this amount to be understated.
5. Meet EU legislative targets.<sup>8</sup> The UK has signalled it will meet and match EU legislative targets even after Brexit. These include the obligation across the EU to separately collect and treat biowaste from households by the end of 2023. Only biowaste separately collected and treated in composting and AD will count towards the overall recycling target.

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<sup>5</sup> Press release: <https://www.gov.uk/government/news/gove-appoints-food-waste-champion>

<sup>6</sup> [https://ec.europa.eu/clima/policies/strategies/2020\\_en](https://ec.europa.eu/clima/policies/strategies/2020_en)

<sup>7</sup> Committee on Climate Change, 2019: <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>

<sup>8</sup> EUR-Lex: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32018L0851&from=EN>

6. Reduce overall waste. Whilst most evidence is anecdotal and difficult to verify; many observers suggest that by separately collecting food waste householders reduce their food wastage as they can see themselves how much this is
7. Drive forwards the bioeconomy. Biowaste is a future, potential feedstock not just for energy and compost but potentially as a source of chemicals for the nascent biotechnology industries in which (see the Bioeconomy Strategy published in December 2018) the UK wishes to become a leader.<sup>9</sup> Compostable packaging materials usually contain between 30% and 95% bio-based content which can be a feedstock derived from farming and agricultural waste within the UK (see the Ricardo E&E report “Plastics in the Bioeconomy” below. ) In this respect BBIA is involved in two research projects which attempt to extract suitable chemicals from food waste to use as a feedstock for materials. Many similar projects are underway in the EU and also in the UK.
8. Creates employment. SESA, an Italian company treating 535,000 tonnes of biowaste in its plant at ESTE in north east Italy, calculates that for every 10,000 tonnes of biowaste collected and treated, 15 full time jobs are created in the direct collection and treatment systems, plus an unquantified number of indirect jobs. Considering the ambition to collect and treat an estimated extra 3 million tonnes in England, we can consider some 4500 new, full time jobs will be created.
9. Improve recovery of soil improvers through the production of compost from composting. The UK has lost 84% of its topsoil since 1850 and the return to soil of compost and organic matter can help replenish this loss.<sup>10</sup> Further, the recovery of nitrogen in digestate and compost reduces dependence upon fossil fuel based fertilisers, and provided these are produced and used in the most environmentally suitable way, can bring substantial benefits to UK farming and the wider UK economy.
10. Close the value chain for compostable packaging and reduce plastic waste. Compostable packaging is increasingly being adopted by brands to reduce the impact of plastics but also to improve recyclability- compostable films can be easily composted in industrial composting units. Many plastic films are contaminated by food stuffs and cannot be easily recycled, and most are not recycled at all. As evidenced by the EU Parliament in 2014 plastic film recycling across the EU is less than 10% and unlikely to grow in the foreseeable future.<sup>11</sup> Compostable packaging, if collected and treated with biowaste, helps reduce wastage of non-recyclable plastic packaging, especially films.
11. Collecting biowaste separately allows the reduction in the frequency of residual waste collections, which DEFRA has stated should be organised on a minimum two weekly basis. We would emphasise however, that the quality of the collection system, its ability to reduce contamination and to intercept high levels of biowaste, are the essential ingredients in a successful waste management system.

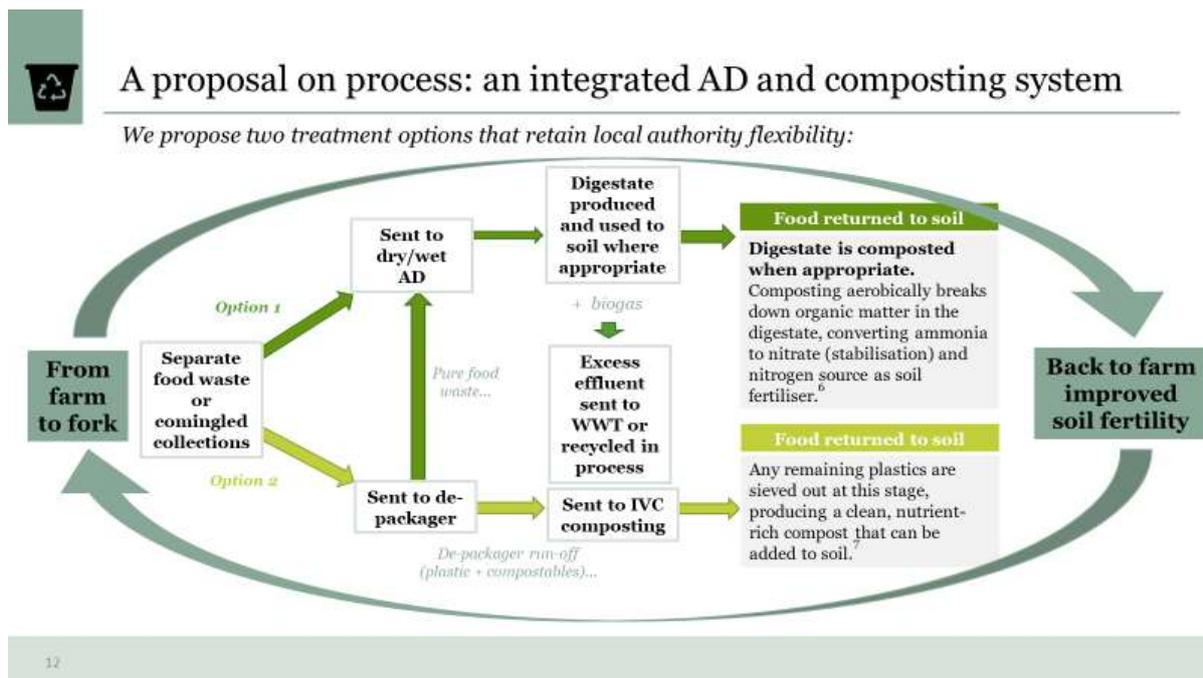
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<sup>9</sup> UK Government: <https://www.gov.uk/government/publications/bioeconomy-strategy-2018-to-2030>

<sup>10</sup> <https://sustainablesoils.org/facts-figures-1>

<sup>11</sup> European Parliament: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//NONSGML+REPORT+A7-2014-0174+0+DOC+PDF+V0//EN>

**In conclusion**, whilst we envisage a system in which food waste is mainly presented separately for collection across England in a way that is uniform, we recommend that the Government recognises the important role commingled collections of food and garden waste can play in intercepting high levels of “biowaste” and the important role IVC has to play in closing the system to ensure high quality materials are returned to soil. We therefore recommend DEFRA allow local authorities the flexibility to choose comingled collections. In addition, we envisage an integrated AD and composting model which can be visualised in the below diagram which we explain further in the text of this submission.



**c. Getting a cleaner end product – looking beyond end of life to product manufacturing**

The consultation focusses its attention upon the collection systems needed to ensure higher interception rates for waste streams that can be sent to recycling. This is comprehensible in the current English scenario in which each Council has their own collection system- a harmonisation of these is highly recommended to ensure harmonisation on communications to citizens across the Nation and to reduce collection costs and ensure benchmarking between Councils is possible. Currently it is impossible to compare performance of the various systems with each Council claiming its own system is the most suitable for purpose.

However, the consultation fails to sufficiently take into account the reasons for which improved consistency in recycling is needed- to ensure a high quality of the end products which are derived from recycling collections and treatment. Collection of waste in separate streams is undertaken to improve recovery and should therefore be driven by the need to ensure a final product suitable for purpose and which has a market.

We recall the four criteria required in order for a waste to obtain end of waste status:<sup>12</sup>

<sup>12</sup> European Commission: [http://ec.europa.eu/environment/waste/framework/end\\_of\\_waste.htm](http://ec.europa.eu/environment/waste/framework/end_of_waste.htm)

- the substance or object is commonly used for specific purposes;
- there is an existing market or demand for the substance or object;
- the use is lawful (substance or object fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products);
- the use will not lead to overall adverse environmental or human health impacts.

Further, when judging end of waste criteria, the following shall be taken into consideration:

Those detailed criteria shall ensure a high level of protection of the environment and human health and facilitate the prudent and rational utilisation of natural resources. They shall include:

(a) permissible waste input material for the recovery operation;

(b) allowed treatment processes and techniques;

(c) quality criteria for end-of-waste materials resulting from the recovery operation in line with the applicable product standards, including limit values for pollutants where necessary;

(d) requirements for management systems to demonstrate compliance with the end-of-waste criteria, including for quality control and self-monitoring, and accreditation, where appropriate; and

(e) a requirement for a statement of conformity.

It is therefore clear that with current collection practices for biowaste, it is difficult to meet end of waste criteria because the inputs which include vast amounts of plastic contamination, are not “permissible waste input material for the recovery operation”.

This is not explained in the Proposals for Separate Food Waste Collection. Unless the collection system for biowaste is tailored to the final product output, we will not ensure that the end product (compost or digestate) meets relevant standards and brings environmental and economic benefit to their final sink: soil. If compost and digestate do not meet legally binding PAS100/110 requirements, they are defined as waste. If inputs include materials which are not permitted for the recovery operation (i.e. production of biogas and compost/digestate according to PAS100/110) then we risk not being able to count those plants as recovery operations. As we will see below, the high level of plastic contamination in composts and digestates risk us having to consider that these materials do not reach the above end of waste criterion that “the use will not lead to overall adverse environmental or human health impacts.”<sup>13</sup>

Operators producing waste from food waste treatment will therefore potentially be non-compliant with their authorised operations as Recovery Operations (R10). By having non-compliant inputs and non-compliant outputs containing for example plastics in compost and digestate beyond the PAS100/110 limits, operators would become Disposal Operations which would render the whole collection chain pointless as well as being legally non-compliant. According to REAL (the certification body for PAS100) no more than 50% of composting plants are in the certification programme which implies that large amounts of non-compliant materials containing plastics are being spread to soil. This needs to be stopped immediately.

We desperately need to clean up our biowaste collection systems to reduce contamination.

It is notable that in the 65-page consultation document, the quality of soil is not mentioned once. Yet soil is the essential factor to consider when understanding how and why we implement biowaste

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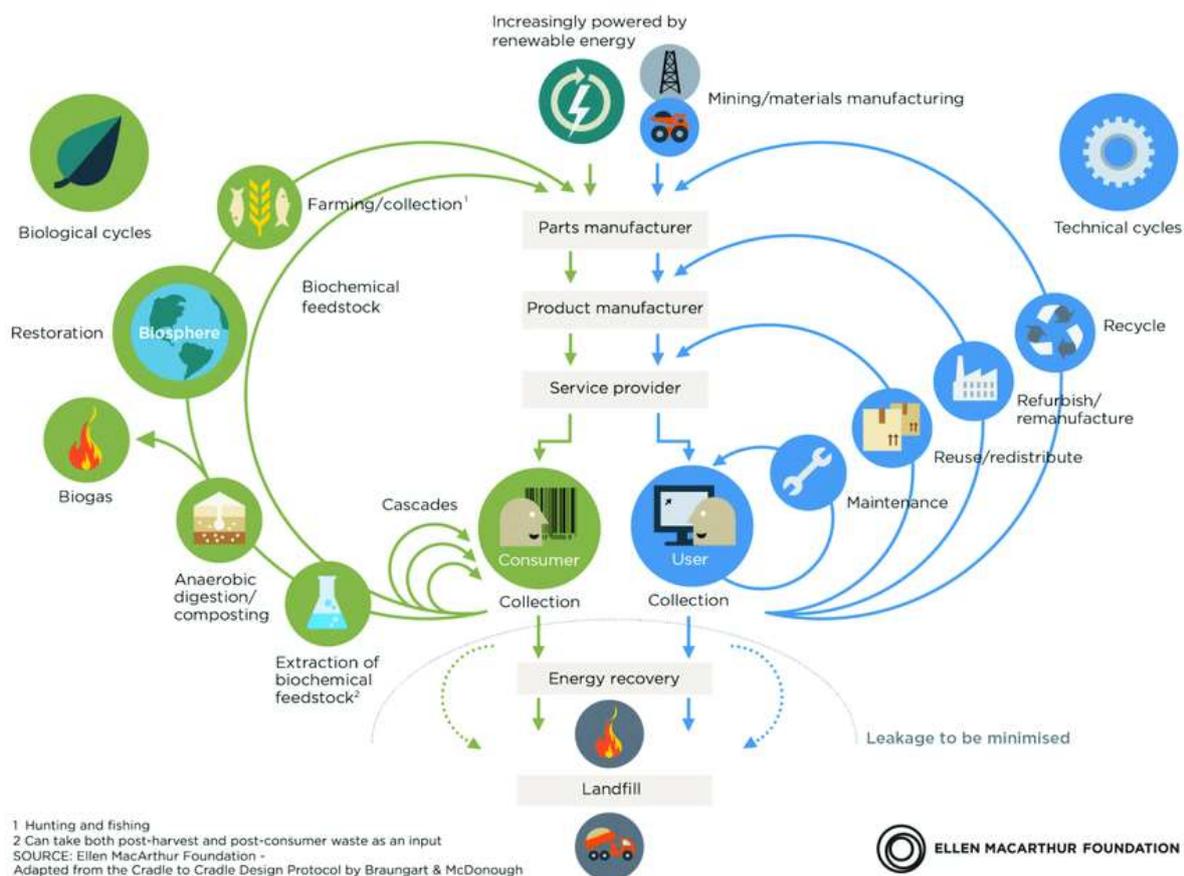
<sup>13</sup> Ibid.

collections. Without the materials collected being recovered in a way that benefits soil, we have less reason to separately collect biowaste in the first place, apart from the energy value.

The end of waste of biowaste is when it is sent to appropriate treatment - currently anaerobic digestion or composting; the end of waste status is when this output meets PAS100/110 criteria. Whilst we argue that these also need to be revised to ensure greater environmental protection, unless we base our treatment and collections systems upon these premises, we may risk producing waste that has to be disposed of, rendering the whole exercise a waste of time, money and energy. Our ambition must be to produce quality products that have a marketplace in improving the quality of soil in the UK as well as renewable energy.

#### **d. Soil quality and health in the UK**

The research undertaken on the “Effects of agricultural management practices on soil quality: A review of long-term experiments for Europe and China” in 2018 underlined the threats to soil in Europe, including loss of organic carbon and the benefits of using compost to reduce these impacts.<sup>14</sup> Minister Gove has himself said that without correction, the UK risks having sterile and unproductive soils within our lifetimes.<sup>15</sup> Soil produces 95% of our food, the majority of our drinking water either flows over or through it, it is a barrier to flooding, contains significant organic carbon and biodiversity essential to the overall function of the biosphere.<sup>16</sup> Good quality, healthy soils are essential to our survival as a species.



<sup>14</sup> Bai et al., 2018: <https://www.sciencedirect.com/science/article/pii/S016788091830224X>

<sup>15</sup> Sustain, 2017: [https://www.sustainweb.org/news/oct17\\_gove\\_soil\\_fertility/](https://www.sustainweb.org/news/oct17_gove_soil_fertility/)

<sup>16</sup> FAO, 2015: <http://www.fao.org/3/a-i4405e.pdf>.

Biowaste is a key component of the “biological cycle” as evidenced in the above graphic from the Ellen MacArthur Foundation.<sup>17</sup> In a Circular Economy model biowaste is a restorative element for maintaining the biosphere, producing biogas, compost and chemicals. In a future scenario, bioreactors or biorefineries may well be fed by biowaste where energy, compost and chemicals are all part of the outputs from those wastes.

The Ellen MacArthur Foundation further illustrates how, at a global level, we have detached the lives and consumption patterns of increasingly urbanised populations from the soil upon which they depend for food supplies. Indeed only 2% of all the available nutrients and organic carbon we have in biowaste is recycled back to where it came from – soil.<sup>18</sup> This leads to the use of artificial fertilisers and chemical substitutes for organic nutrients (such as compost) that further lead to depletion of soil quality. Professor Lal in 2004 estimated that “an increase of 1 ton of soil carbon pool of degraded cropland soils may increase crop yield by 20 to 40 kilograms per hectare (kg/ha) for wheat, 10 to 20 kg/ha for maize, and 0.5 to 1 kg/ha for cowpeas. As well as enhancing food security, carbon sequestration has the potential to offset fossil fuel emissions by 0.4 to 1.2 gigatons of carbon per year, or 5 to 15% of the global fossil-fuel emissions.”<sup>19</sup>

The European Commission recently reported that the EU27 loses the equivalent of 9 million tonnes of topsoil annually<sup>20</sup> - the Sustainable Soil Alliance quote the Committee on Climate Change that evidenced in 2015 that for the UK this figure is around 3 million tonnes (1-3cm per annum) some of which is naturally unavoidable but part of which is due to farming methods.<sup>21</sup> The need to recycle our biowastes and bring them back to soil is made more impellent by this data. However, bringing organic matter back to soil is not important just for the quantity we recover in order to maintain soil health and fertility especially in those areas at most risk, but above all for the quality. The quality of nutrients being recycled back to soil is a significant cause for concern.

#### **e. The Quality of Biowaste Recycled to Soil in the UK**

Research currently being undertaken by the University of Plymouth on microplastics contamination of soil will give us new, up to date data for the UK. A study published in 2017 by the Oxford Centre for Ecology and Hydrology and published in Science of the Total Environment found microplastics in soil at a level similar or beyond that to marine environments, stating that “Despite land being the least studied environmental compartment, many of the ecological risks of microplastics identified in aquatic species will also apply to terrestrial ecosystems due to the many ecological and taxonomic parallels that exist between resident species.”<sup>22</sup>

Such a study made in Germany in 2017 however is a pointer for the UK too- this found that the second largest source of microplastics found in soil in Germany derived from compost and digestate put to soil (the largest being the wear of car tyres as most sewage sludge is incinerated).<sup>23</sup> Plastics entering

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<sup>17</sup> Ellen MacArthur Foundation: <https://www.ellenmacarthurfoundation.org/circular-economy/infographic>

<sup>18</sup> Ellen MacArthur Foundation: [https://www.ellenmacarthurfoundation.org/assets/downloads/Cities-and-Circular-Economy-for-Food\\_280119.pdf](https://www.ellenmacarthurfoundation.org/assets/downloads/Cities-and-Circular-Economy-for-Food_280119.pdf)

<sup>19</sup> Lal, 2004: <https://science.sciencemag.org/content/304/5677/1623>

<sup>20</sup> Sustainable Soil Alliance: <https://www.politico.eu/pro/europe-soil-hotspots-damaged-farm-land/>

<sup>21</sup> Sustainable Soil Alliance: <https://sustainablesoils.org/facts-figures-1>

<sup>22</sup> Horton et al., 2017:

[https://www.researchgate.net/publication/313358945\\_Microplastics\\_in\\_freshwater\\_and\\_terrestrial\\_environments\\_Evaluating\\_the\\_current\\_understanding\\_to\\_identify\\_the\\_knowledge\\_gaps\\_and\\_future\\_research\\_priorities](https://www.researchgate.net/publication/313358945_Microplastics_in_freshwater_and_terrestrial_environments_Evaluating_the_current_understanding_to_identify_the_knowledge_gaps_and_future_research_priorities)

<sup>23</sup> Weithmann et al.,2018: <https://advances.sciencemag.org/content/4/4/eaap8060>

the collection system in Germany are fragmented when shredded prior to treatment in AD and compost plants and those fragments are not entirely screened out, resulting in contamination of soil.

Indeed PAS 100 standards in the UK do recognise that plastic contamination to soil is inevitable under current collection systems. PAS 100 allows a tolerance of 0.125% of plastics in the final composted product. This is among the lowest permitted level of anywhere in Europe we know of. However, whilst low, this allows 1.25 kilos of plastic per 1000 kilos of compost to be applied to soil, the equivalent of more than 150 plastic bags per tonne of compost (a single use plastic carrier bag typically weighs 8 grams). Applying just 10 tonnes of compost per hectare to soil would lead to depositing some 1500 carrier bags equivalent per hectare to soil legally (30 cubic metres or 10 tonnes is a normal dosage per hectare).

Recognising this level of pollution to be unacceptable, the Scottish Environment Protection Agency has mandated a revision of these standards and has introduced a new tolerance level 50% below those accepted in England.<sup>24</sup> A representative of the EA in a recent speech indicated that plastic contamination of biowaste collections leading to contamination of compost and digestate in England was unacceptable and that standards should be brought into line with Scotland as soon as possible.<sup>25</sup> For these same reasons Italy mandated by law in 2010 that all biowaste has to be collected with either no packaging at all or, if packaging is used, that it should be compostable in order to avoid soil contamination.<sup>26</sup> Finding that in any case citizens often used plastic shopping bags to collect their biowaste, Italy mandated in 2012 that all single use carrier bags should also be compostable, to promote their re-use as biowaste collection instruments. Contamination of biowaste collections in Italy has continuously fallen due to these legislative instruments.<sup>27</sup>

We should address other issues around the use of biowaste recycled back to soil such as nitrate application from wet digestate. WRAP has found that digestate use provides high volumes of nitrogen to plants in the short season that the weather allows such spreading but that the high concentration of nitrates is harmful to the bacteria, worms and other microfauna needed for healthy soils.<sup>28</sup> Further still, ammonia emissions and nitrate leaching are found to be higher from digestate use when compared to compost as was the level of soil compaction.

Finally, we have to address correlated consequences of the way in which food waste treatment in AD plants may lead to unforeseen environmental externalities in the form of ammonia emissions. According to DEFRA's own Clean Air Strategy 2019 ammonia from agriculture amounts to 88% of overall UK ammonia emissions whilst the waste sector contributes another 4%.<sup>29</sup> In the 88% figure however, we have to include emissions from spreading wet digestate to soil and these emissions have been increasing since 2015.

Given the ambition of the Resources and Waste Strategy (RWS) to ensure *several more million tonnes* of currently landfilled or incinerated food waste are treated through anaerobic digestion with the

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<sup>24</sup> SEPA, 2017: <https://www.sepa.org.uk/media/219843/wst-g-050-regulation-of-outputs-from-composting-processes.pdf>

<sup>25</sup> Environment Agency representative at the Annual ORG Conference, 14<sup>th</sup> March 2019: Protecting the UK's Landbank for all. Presentation available upon request.

<sup>26</sup> Italian Law 205/2010, Article 182-ter: [http://www.bosettiegatti.eu/info/norme/statali/2006\\_0152.htm#182-ter](http://www.bosettiegatti.eu/info/norme/statali/2006_0152.htm#182-ter)

<sup>27</sup> Consorzio Italiano Compostatori, 2011: <http://compost.it/biblioteca-on-line/rapporti-annuali-cic/593-rapporto-annuale-2011-compost-e-biogas.html>

<sup>28</sup> WRAP, 2016: [http://www.wrap.org.uk/sites/files/wrap/WRAP\\_DC-Agri\\_research\\_summary.pdf](http://www.wrap.org.uk/sites/files/wrap/WRAP_DC-Agri_research_summary.pdf)

<sup>29</sup> Defra, 2019: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/770715/clean-air-strategy-2019.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf)

essential aim of creating energy, we would be foolish and short sighted to avoid considering the unintended consequences of this policy both in terms of physical contaminants (plastic driven to soil through digestate) and ammonia emissions both from the storage of several million tonnes of wet digestate and its spreading to soil.

Clean air is a basic human right. But air quality in the UK is a major killer. The DEFRA Clean Air Strategy counts estimated deaths from dirty air to be between 28,000 and 36,000 annually.<sup>30</sup> The UK is under an EU infraction due to the failure to implement legislation to improve air quality. It would be an unprecedented abdication of responsibility if the Government did not recognise the need to improve air quality and did not take advantage of policy instruments outlined in the RWS, at least with regards to waste management.

Policies related to collection and treatment of biowaste therefore need to be viewed holistically in terms of their impact across the system from household and businesses back to farm. It cannot be a consequence of policy that we worsen the quality of soil, water and air; we must legislate to ensure the system brings continuous and measurable improvement. Given the ambition to dramatically increase the volumes of biowaste treated, action has to be taken now to reduce predictable risks from these new volumes.

This means ensuring that the collection of biowaste reduces contamination from materials that are incompatible both with the treatment of biowaste and its quality when recycled to soil. According to the EA presentation dated 14<sup>th</sup> March 2019 the quality of soil is often compromised by compost and digestate containing plastics so these must be avoided upstream.<sup>31</sup>

Further, given the existing rise in ammonia emissions and the potential for these to increase with larger volumes of food waste treated in AD operations, measures must be enacted now to reduce damaging emissions in the future.

#### **f. The Quality of Packaging and Packaging Waste**

HMRC data shown in Figure 1 below illustrate the failure of plastics packaging recycling in the UK. Plastic packaging waste reprocessed in the UK represents circa 14.0% of the total plastic packaging put onto the market and once contamination of the 14.0% is deducted no more than 10% is effectively recycled in the UK itself: 60% is not even collected for recycling but simply landfilled or incinerated and an unquantified amount leaks into the environment. The rest is exported. Exports are directed to countries where waste management systems are generally not able to recycle them and therefore UK plastic waste is directly contributing to littering entering into ocean systems.

Reports in recent months have highlighted how UK plastic waste is dumped in Asian countries, contaminating water, air and soil systems.<sup>32</sup> Sadly the plastic industry has known of these

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<sup>30</sup> Defra:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/770715/clean-air-strategy-2019.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf)

<sup>31</sup> Environment Agency representative at the Annual ORG Conference, 14<sup>th</sup> March 2019: Protecting the UK's Landbank for all. Presentation available upon request.

<sup>32</sup> DW, 2019: <https://www.dw.com/en/after-chinas-import-ban-where-to-with-the-worlds-waste/a-48213871>; Greenpeace, 2018:

<https://www.greenpeace.org/seasia/PageFiles/936685/The%20Recycling%20Myth%20-%20Malaysia%20and%20the%20Broken%20Global%20Recycling%20System.pdf>; Greenpeace, 2018: <https://www.greenpeace.org/international/press-release/19566/recycling-from-developed-world-dumped-in-malaysia-and-left-to-rot/>

environmental externalities for some years<sup>33</sup> and has failed to act accordingly and continues to lobby for zero change, as the Guardian on May 10<sup>th</sup> 2019 has reported.<sup>34</sup>

The widespread dumping of plastic waste in developing countries that originated in OECD countries has led the parties to The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal to include plastic among those wastes that are subject to reporting when exported to developing nations. The UK is signatory to the Convention. The impact of this decision (announced May 10<sup>th</sup> 2019) will be to severely restrict plastic waste exports to less developed nations, requiring us in the UK to recycle, incinerate or landfill more of our plastic wastes.<sup>35</sup>

Figure 1: Plastic Packaging Waste Treatment in the UK 2016-2018:<sup>36</sup>

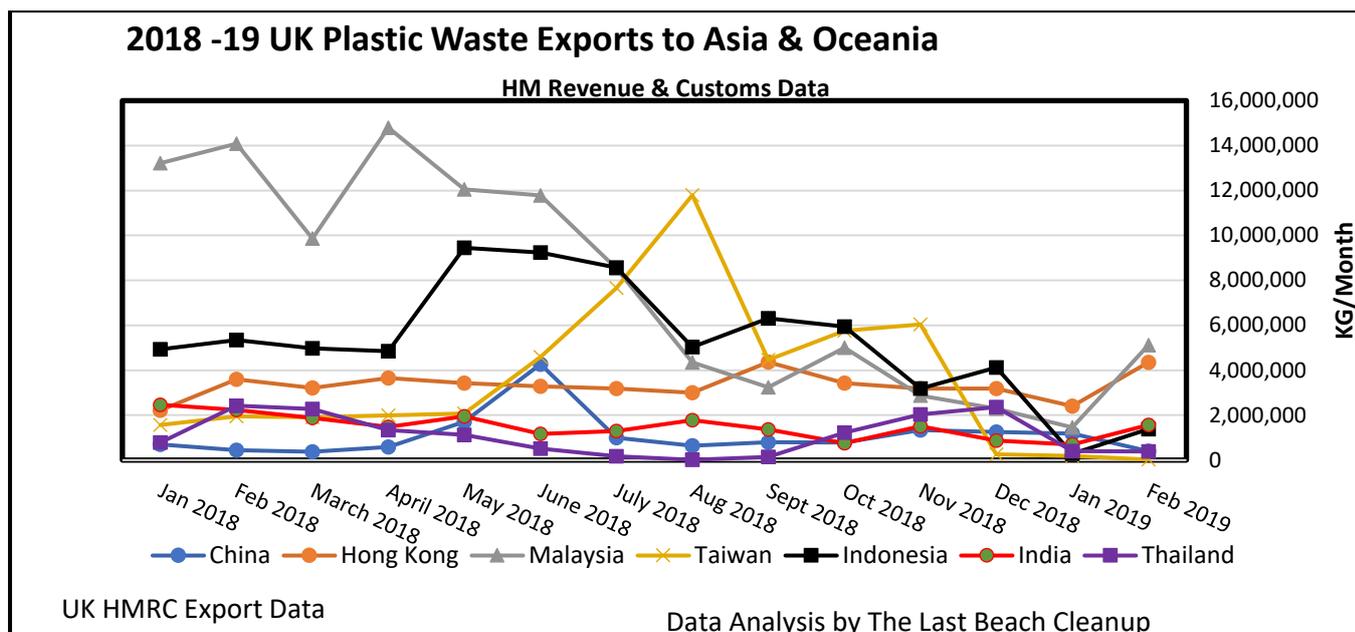
UK Plastic Packaging Waste Treatment	(1000 Metric Tonnes)		
	Data from Recoup 2016	Data from Recoup 2017	2018 - From UK HMRC Govt Data
Plastic Packaging Waste Arisings	2,260	2,350	2,444
<b>Net Plastic Waste Exported Outside of EU (Net of Imports)</b>	647	520	437
Plastic Waste Reprocessed in UK	331	358	343 (represents circa 14.0%)
Total %: Exported & Reprocessed ("Recycled")	<b>43.3%</b>	<b>37.4%</b>	<b>31.9%</b>
<b>Net Plastic Waste Dispatched to EU</b>	59	55	89
Total %: Exported, Dispatched & Reprocessed ("Recycled")	<b>45.9%</b>	<b>39.7%</b>	<b>35.6%</b>
Plastic Waste Not Recovered	1,223	1,417	1,575
<b>% Plastic Waste Not Recovered</b>	<b>54.1%</b>	<b>60.3%</b>	<b>64.4%</b>

<sup>33</sup> Daily Mail, 2018: <https://www.dailymail.co.uk/news/article-5240389/Plastic-industry-hid-pollution-crisis-50-years.html>

<sup>34</sup> <https://www.theguardian.com/environment/2019/may/10/plastics-lobby-group-pushed-treasury-to-ease-back-on-tax-reform>

<sup>35</sup> <http://www.brsmeas.org/?tabid=8005>

<sup>36</sup> Recoup: <http://www.recoup.org/p/324/uk-household-plastics-collection-survey-2018> & WRAP: <http://www.wrap.org.uk/content/plasticflow-2025-plastic-packaging-flow-data-report>



The recycling failure is due to two principle reasons:

- 1) Most plastics are hard to recycle because of the way in which they are contaminated both by other plastics (different and composite polymers) and by other materials they are attached to- aluminium and paper for example or contaminated by food. Clean single stream plastics like PET bottles are rare- where they exist recycling can work but this is the exception to the rule.
- 2) Plastics are readily and ubiquitously available, very versatile, extraordinarily cheap and becoming cheaper as enormous new volumes of plastics come on stream especially in the USA using cheap shale gas and oil as a feedstock. One estimate from CIEL is that plastics production will contribute 30% of all GHG emissions from the petro-chemical industry as production rises from the current 330 million tonnes to circa 500 million tonnes and the consumption of oil by the entire plastics sector will account for 20% of total oil consumption by 2050.<sup>37</sup>

BBIA adheres to WRAP’s Plastic Pact initiative to reduce the impacts of plastic packaging. Measures to reduce the number of polymers to facilitate recycling, to introduce chemical recycling, and to move to compostable plastics are being studied by members of the Plastics Pact. We support these measures as seen to date. We should further note that HM Government is signatory to the Global Commitment of the New Plastic Economy promoted by the Ellen MacArthur Foundation which has several ambitions:<sup>38</sup>

- All plastic packaging is 100% reusable, recyclable, or compostable
- All plastic packaging is reused, recycled, or composted in practice
- The use of plastic is fully decoupled from the consumption of finite resources
- All plastic packaging is free of hazardous chemicals, and the health, safety, and rights of all people involved are respected.<sup>39</sup>

<sup>37</sup> CIEL, 2017: <https://www.ciel.org/wp-content/uploads/2017/09/Fueling-Plastics-Fossils-Plastics-Petrochemical-Feedstocks.pdf>

<sup>38</sup> New Plastics Economy, 2019: <https://newplasticseconomy.org/assets/doc/Global-Commitment-Signatories-Spring-2019.pdf>

<sup>39</sup> New Plastics Economy: <https://newplasticseconomy.org/projects/global-commitment>

However, whilst voluntary agreements are laudable we above all believe mandatory initiatives from the Government are needed to ensure a level playing field (which voluntary programmes do not) and to give measurable targets, penalties for non-compliance, fiscal policies to stimulate higher performance and a long term trajectory so all actors know where and how they should invest in the packaging of their products going forward.

## **SOLUTIONS FOR CONSISTENCY IN WASTE COLLECTIONS**

### **1. The role of compostable packaging**

Compostable packaging can play a role in the nexus between food and packaging recovery:

1. Reducing the amounts of non-recyclable plastics by sending compostable plastic packaging to organic treatment through composting and AD. This especially regards food packaging.
2. Ensuring recyclability of plastic packaging contaminated by food through organic recycling.
3. Increasing the amount of biowaste sent to AD and composting by using the compostable packaging as a vector for the biowaste itself.

BBIA believes that compostable materials are an answer to specific packaging challenges and could substitute around 5-8% of current plastic packaging as illustrated in the report cited below.

The scope for compostable packaging is contained in the new report called “Plastics in the Bioeconomy”, commissioned by the Biomass Biorefinery Network (BBNet) and authored by Ricardo Energy & Environment<sup>40</sup>, which reaches a conclusion that the UK’s compostable packaging market can grow to over 100,000 tonnes by 2025. This could drive value in excess of £267m annually into the UK bioeconomy before the extensive GVA benefits are realised.

The BBIA proposes compostability is the most practical solution in these current applications (technological progress will lead to many new applications in the future) and that for these uses compostable packaging should be mandatory to ensure that biowaste collections are not contaminated by plastics:

1. Applications which always accompany a material whose only recycling route is organics recycling (composting), and frequently cause contamination and cannot be recycled if made from plastic:
  1. tea bags and coffee pads (COOP have compostable teabags)
  2. sticky labels on fruit/vegetables (Marks & Spencers have adopted compostable labels)
  3. Food preparation disposable gloves
  4. Plastic coffee pods (Percol is a brand using compostable pods)
2. Applications where inevitable food contamination and/or mixed-material construction renders conventional packaging unsuitable for mechanical recycling:
  1. Foodservice disposables (plates, bowls, food containers, trays/dishes, napkins, sandwich boxes, bread and cake window bags, hot and cold drinks cups and lids etc)
  2. Condiment sauce sachets and pouches
3. Applications where the item is too small or otherwise impractical for mechanical recycling:

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<sup>40</sup> Ricardo Energy & Environment: <https://d1v9sz08rbysvx.cloudfront.net/ee/media/downloads/ed12430-bb-net-report-final-issue-2.pdf>

1. candy and sweet wrappers and others that are commonly littered.
4. Applications which can be used or reused as a food waste caddy liner:
  1. Carrier bags,
  2. Bin liners for food waste collections,
  3. Very lightweight fruit and vegetable bags
  4. Lightweight fresh produce packaging (eg. the Waitrose banana bag or for salads, spinach, loose small and leaf vegetables and fruit)
  5. Magazine wraps – may be reused to collect householder food waste, to take from kitchen caddy to outside bin
5. Conversely, we believe that compostables do not have a role to play where plastics can be easily recycled – water, juice and milk bottles, pallet shrink wrap, long shelf life products etc.

Compostables make most sense where the contents, to be recovered, have also to be composted. Organic recyclers such as AD and composting plants can become the terminal for compostable packaging which is also bringing biowaste to those recyclers.

On the matter of biodegradable waste recovery in the UK we underline how composting and AD is already a large, technologically mature and geographically widespread industrial solution to recovering these wastes. The European Compost Network estimates that the UK currently recovers overall almost 9 million tonnes of various “biowastes” and therefore the capacity to also treat compostable packaging (estimated somewhere between 100,000 and 150,000 tonnes at full potential or circa 1.5% of biowastes) is more than evident.<sup>41</sup>

52 In Vessel Composting plants and 155 Open Windrow Composting plants operate on a daily basis across the UK.<sup>42</sup> Compostable packaging is compatible with the composting process as we illustrate below.

As compostables increase their penetration of the packaging market in the UK (as shown in the Ricardo report cited above) but also elsewhere, alarm bells have been ringing in the many offices of food companies, packaging experts, waste collectors and Councils. Do compostables actually compost? What are their standards? How do we collect them? Is this all green-washing? Who are the producers and are these products the same as oxo degradable plastics? Here are some answers to these understandable concerns.

- a) Research from 2018 from Dublin University shows that tested and widely available compostable materials all biodegrade in industrial composting in the time frame of the BSEN13432 standard.<sup>43</sup> This is not surprising as these materials now have more than 20 years of market experience and the technologies are mature. The standards have been reviewed five times since 2000 and reconfirmed each time without significant changes. In fact, compostable (plastic) products have been in the UK market since 2002 and we are not aware of a single genuine and verified complaint of incompatibility – “non-composting” – even when at deployed at high volume such as at the London Olympics 2012.
- b) The producers of current compostable (plastic) products are a mix of international companies to be found in the Far East, the USA but above all in Europe and recently in the UK. When

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<sup>41</sup> European Compost Network (2019). ECN Status Report 2019: European Bio-waste Management. Available upon request.

<sup>42</sup> Data from the Renewable Energy Association and Environment Agency

<sup>43</sup> Narancic et al., 2018: <https://pubs.acs.org/doi/10.1021/acs.est.8b02963>

collected with biowaste, compostable packaging can be composted safely in industrial composting plants without damage to their systems, to the quality of compost and above all to the soils to which they are destined. The evidence shows that BBIA member companies are science-based enterprises producing innovative materials from mostly plant based feedstocks that have lower GHG emissions in the production phase and a substantially higher chance of effective recycling at the end of life phase.<sup>44</sup>

- c) Another common complaint against compostable plastics is that they contaminate the recycling of plastic packaging. There are two replies to this: firstly, upon what evidence is that based? We are aware of only two studies that investigate this claim.

A report from Germany states that “Up to 3 weight percent of PLA in post-consumer PP recyclates and up to 10 percent of PLA in PS re-granulates do not disturb or negatively affect the quality of the recycled material.”<sup>45</sup>

The second was undertaken by the national packaging association of Italy (CONAI) in 2011.<sup>46</sup> They found that even were all the compostable plastics potentially entering the marketplace in Italy (currently circa 100,000 tonnes) to be concentrated into contamination of plastics packaging waste (in Italy 1.9 million tonnes)<sup>47</sup>, plastics tolerate contamination of between 2 and 10% of their feedstocks from compostables without altering the final recycled polymer quality. Assuming it is unlikely that every tonne of compostable packaging would end up with plastic recycling, the risk of damaging plastic recycle is negligible.

Infrared readers in sorting equipment are perfectly capable of sorting out compostable PLA from other rigid plastics.<sup>48</sup> Those same infrared readers regularly sort plastics into their various polymer types and adaptation to a new waste stream such as rigid compostable plastics can be rapid.

The second answer to this is: it is hard to contaminate what is not actually being recycled at all. And as we have seen from the above data charts, before we reach a stage in the UK where more plastics are effectively recycled, we have a long road to travel especially for filmic plastic materials. Nevertheless, accurate, quality collection systems will help ensure avoidance of cross contamination of plastics in biowaste and compostable plastic in plastics.

As further evidence, global plastics production is in excess of 330 million tonnes; compostable plastic production is approximately 2 million tonnes, less than 1% of all plastics globally. The chances of compostable plastics polluting this huge amount of plastics which are polluting everything else, is therefore quite obviously remote.

- d) The Single Use Plastic Directive, approved on March 27<sup>th</sup> 2019 and about to enter into force throughout the EU28 bans the sale and use of oxo degradable plastics, which are not to be confused with compostable plastics.<sup>49</sup> We strongly support this ban and challenge the UK Government to introduce the ban into UK law even before the transposition of the EU Directive is needed, latest in 2021. This will ensure an increase in clarity in the UK marketplace as well as improved management of plastic waste.

To ensure the value of compostable packaging is realised and that it supports the reduction of plastic waste, the improved collection of biowaste, improved quality of recycled biowaste to soil,

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<sup>44</sup> CE Delft: [https://www.cedelft.eu/publicatie/biobased\\_plastics\\_in\\_a\\_circular\\_economy/2022](https://www.cedelft.eu/publicatie/biobased_plastics_in_a_circular_economy/2022)

<sup>45</sup> European Bioplastics: <https://www.european-bioplastics.org/pla-in-the-waste-stream/>

<sup>46</sup> CONAI, 2012: Task Force Biodegradable Packaging Recovery Project Final Report. Available upon request.

<sup>47</sup> <http://www.corepla.it/#>

<sup>48</sup> [https://docs.european-bioplastics.org/publications/bp/EUBP\\_BP\\_Mechanical\\_recycling.pdf](https://docs.european-bioplastics.org/publications/bp/EUBP_BP_Mechanical_recycling.pdf).

<sup>49</sup> European Commission, 2019: [http://europa.eu/rapid/press-release\\_STATEMENT-19-1873\\_en.htm](http://europa.eu/rapid/press-release_STATEMENT-19-1873_en.htm)

compostable packaging needs to be collected in a way that it does not potentially in the future interfere with plastics recycling- compostable packaging should be considered the equivalent of biowaste and be sent to biowaste treatment.

Where compostable packaging is destined to biowaste collections that involve AD treatment, the stripped-out packaging should be sent to composting. In the future, when biowaste collections destined to AD are clean and contain only or predominantly compostable packaging, de-packaged compostables will have an easier route to recovery through being sent to composting. Given that this de-packager off-take contains roughly 5% food waste, this would need to be treated with in-vessel composting to satisfy the Animal By-Product Regulations.

Such a model exists in the UK: the integrated AD and compost plant The Maltings.<sup>50</sup> It shows that with the right system, an AD plant can ensure valuable food waste stuck to compostable packaging is recovered with that packaging after the digestion phase in composting. This is a model widely adopted throughout Europe and which underlines the importance of creating complementary synergy between AD and composting.

## **2. Legislation to enable the transition**

The collective aims of the consultations are to increase the amounts of clean waste sent to recycling to improve recycling rates, to produce outputs useful for new products and as regards biowaste for soil quality; reduce GHG emissions, increase renewable energy production, provide the UK PLC with home-grown resources, reduce dependence upon exports of waste, and stimulate domestic industries at costs which are affordable to the community and to tax payers.

The specific aims to reduce food waste disposal, reduce plastic waste disposal and exports, reduce side effects caused by contamination to soil and air, must be seen in a holistic way.

BBIA propose:

1. Biowaste must be collected separately or commingled where suitable for local conditions either without any packaging or in compostable bin liners certified BSEN13432 and soil biodegradable under standard ISO17556 to ensure any fragments going to soil decompose without harm.
2. A DEFRA Working Group should be established to determine the quality standards, the colour and the marking of these bags so they are uniform across the Nation. Uniformity could be introduced today to ensure citizens are used to the new bags when everyone will have food and garden waste to collect by the end of 2023.
3. Biowaste collections should allow the co-collection of compostable packaging. As the Government's intention is to finance bin liners, logic demands that packaging can be collected with biowaste.  
Food waste should be defined as per the Waste Framework Directive Article 3 point b.4.:  
"bio-waste" means biodegradable garden and park waste, food and kitchen waste from households, offices, restaurants, wholesale, canteens, caterers and retail premises and comparable waste from food processing plants;"

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<sup>50</sup> Maltings Organic Treatment: <https://www.maltingsorganic.com/news/maltings-method/>

Further, biowaste should include the provisions under the EU Waste Framework Directive as per Article 22 and namely that:

“Member States may allow waste with similar biodegradability and compostability properties (e.g. compostable bin caddy liners) which complies with relevant European standards or any equivalent national standards for packaging recoverable through composting and biodegradation, to be collected together with bio-waste.”

4. Only materials suitable for application to soil should be allowed for delivery to AD and composting facilities in order to meet end of waste criteria both on inputs and outputs. To ensure recovery of compostable materials and the food they contain when sent to AD, they should be stripped out and sent to composting- either separately or with dewatered digestate.
5. To ensure that spreading of outputs from AD to soil are not causing harm and to reduce ammonia emissions as biowaste collections destined to AD grow, AD plants should consider where appropriate dewatering the digestate and sending the solid part to composting and the liquid to wastewater treatment or to recycle in the composting process itself. This could apply, for example, where the liquid digestate has no positive sales value because it would not achieve the criteria of end -of-waste unless it has a readily available marketplace. We believe digestate from food waste treatment therefore should be spread to soil with the same physical, biological and chemical characteristics as PAS100 compost.
6. To reduce contamination of plastics contained in compost sent to soil post biowaste treatment, and for digestate spread directly to soil, the English standard for PAS100/110 should be aligned with the standards applied in Scotland.

## **Conclusions**

BBIA warmly welcomes the intention of HM Government to introduce mandatory separate biowaste collections across England for households and relevant businesses from 2023. This will help transform the whole waste and resource industry in a radical and positive way, to improve resource efficiency, increase recycling rates, reduce GHG emissions and produce valuable renewable resources for energy and soil. We realise that a transition period of at least five years will be needed before these changes are in place.

In order to ensure nationwide participation of citizens and councils we recommend that where existing contractual arrangements can prove to be successful and meet the targets relating to overall recycling (65% by 2035) then they should be respected. The whole of Greater Manchester area for example, practices commingled collections. Commingled food and garden waste collections often give commendable results and should not be jeopardised. Where citizens do not or will not have access to garden waste collections (about one third of English people live in properties without gardens) then food waste should be collected with bags that are suitable for composting, do not pollute soils and, can be readily identified across the nation with one colour and marking, and that are supplied by Councils to citizens.

To ensure maximum recovery of biowaste through composting and AD, any compostable packaging which is included in biowaste collection systems should pass through a final composting route. This has the benefits of reducing waste sent to incineration, increasing biowaste recovery, and improving compost quality through reduction of plastic contamination to soil.

BBIA recognises that a revised system which completes the biowaste cycle in a cradle to cradle approach has a higher cost than the current system in which biowaste treatment produces several

negative externalities. BBIA recognises that producers of compostable packaging will have to contribute to a revised EPR system to ensure their materials are recovered correctly, and we refer to the consultation on EPR relative to this.

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