Consultation on the management of bio-waste in the European Union

Response by the

1 Introduction


1.2 Under the revised Waste Framework Directive¹ the European Commission has an obligation to carry out a review of the current management of bio-waste, with a view to submitting a proposal if necessary.

1.3 The Green Paper aims to explore possible options for the further development of the Management of bio-waste within the EU and seeks views on how to improve bio-waste management in line with the waste hierarchy whilst considering economic, social and environmental gains.

1.4 The Association for Organics Recycling is the United Kingdom’s membership organisation, working on behalf of its members to raise awareness of the benefits of composting and compost use. The Association is committed to the sustainable management of biodegradable resources by promoting the benefits of composting and other biological treatment techniques for the enhancement of the environment, business and society.

1.5 The Association aims to act as an advocate for the wider bio-waste management industry and to represent its views in a constructive dialogue with policy makers. It envisages a bio-waste management industry in which best practice is shared, standards are maintained and surpassed and which makes a positive contribution to safeguarding the environment.

1.6 The Association for Organics Recycling currently has over 500 members including composting, anaerobic digestion and mechanical biological treatment operators, local authorities, consultants, technology suppliers, compost users, academics, other membership organisations and individuals. Given that it represents the majority of compost producers in England and Wales, it welcomes the opportunity to comment on the draft document.

1.7 The Association has consulted with its members on this paper and in light of that made this response.

¹ Revised Waste Framework Directive (2005/0281 (COD)
2 The Association welcomes the opportunity to discuss any of the points raised in this response. Discussion Issues

2.1 Bio-waste recycling within Europe is varied in its development across member nations’ dependant on the infrastructure in place and the support that it has been given by each country at a National level. This response will look in the main at the management of bio-waste within the UK, as this is where our experience lies.

2.2 The Landfill Directive has made a significant impact already on the diversion of bio-waste from landfill, this should be seen as a starting point and not an end point. There will need to be greater emphasis placed on the provision of legislative support in the form of a Bio-waste Directive.

2.3 The UK still appears to regard ‘municipal’ waste as only applying to households; this is not the case in the rest of Europe where catering and retail premises and commercial processing facilities are included. This needs to be changed as it precludes a significant volume of bio-waste form the diversion equation.

2.4 It is estimated that the UK throws away in excess of 20 million tonnes of food waste per annum\(^2\) and this is equally split between commercial, domestic and retail premises. The majority of the 490 local authorities in the UK collect green waste at the kerbside where practicable. Food waste collections however are still in their infancy with approximately one hundred and ten local authorities either collecting food waste separately or co-mingling it with green waste. This number is set to grow over the coming years as more authorities promote food waste collection to assist them in achieving their Landfill Allowance Trading Scheme (LATS) targets.

2.5 The UK has spent a great deal of time and effort in the promotion of quality compost outputs from processing facilities. The main driver has been the PAS 100:2005 specification for composted materials. This initiative was sponsored by the Waste and Resources Action Programme (WRAP) and developed by the Association for Organics Recycling, previously known as the Composting Association. More recently in 2007, PAS 100 has been included as an integral part of the Quality Compost Protocol\(^3\) (later in this document referred as ‘QCP’ or simply ‘the Protocol’). The QCP sets out the criteria for the production of quality compost from source-segregated biodegradable waste and ensures that composted material which has been manufactured according the Protocol does not fall under regulatory control within England and Wales.

2.6 As a result of the QCP, there has been continued growth in the production of quality compost manufactured from source-segregated feedstocks. The Association recognises that collection of clean segregated feedstock comprising of either food or green waste is a prerequisite for quality outputs and in order to sustain continued growth; this must be promoted wherever possible through legislation.

2.7 There are a number of technologies currently operational within the UK for the processing of bio-waste, particularly in respect of the treatment of Animal By-Product compliant material. In recent months DEFRA has heavily promoted the technology of Anaerobic Digestion through a £10m capital support funding initiative. The association recognises that there are significant benefits to this technology, particularly in

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\(^2\) http://www.wrap.org.uk/retail/food_waste/nonhousehold_food.html

\(^3\) EA & WRAP Quality Protocol Compost for the production and use of quality compost from source-segregated biodegradable waste. It can be downloaded from www.organics-recycling.org.uk.
terms of renewable energy from bio-waste, but also wishes to highlight the benefits of using composts and digestates as a soil enhancer.

2.8 The reduction in greenhouse gas (GHG) emissions and their impact on global warming is now recognised as being at a tipping point. The management of bio-resources is now and will in the future continue to play a significant role in the global warming potential debate.

3 Better prevention of waste

3.1 It is imperative that further drivers are in place to reduce waste arisings. Although waste to landfill has declined in recent years, we still focus very heavily on issues lower down the waste hierarchy such as recycling and reuse and often neglect the ‘prevention’ message. Further effort working with multiple retailers will assist this aim through preventing unnecessary packaging waste and increasing the obligations placed on this sector through existing voluntary schemes such as the ‘Corthauld Commitment’4. The UK in particular has worked hard at increasing consumer knowledge and awareness through the work of WRAP; this should be replicated where possible in other Member States.

Question 1: Waste prevention is at the top of the EU’s waste treatment hierarchy. From your experience, what could be specific bio-waste prevention action at EU level?

3.2 Consumer education will continue to be very important in reducing food waste and this needs to be coupled with incentives for multiple retailers to sell food in a responsible manner without encouraging waste. WRAP have this year run a high level campaign ‘Love food, hate waste’, which has been aimed at lifting the profile of food waste and what lies behind it. Continued campaigns of a similar nature will assist in lifting the profile of the food waste issue to householders and commercial premises alike. The latter sector has currently little exposure to campaigns connected with food wastage or its subsequent collection.

3.3 There is currently only a small fraction of food waste collected from the municipal waste stream within the UK; however the LATS driver is now starting to ensure that Local Authorities are taking the collection of this fraction more seriously.

3.4 Home composting is not currently included as part of National diversion targets (LATS); this is misleading and should be changed as soon as possible. An EU Directive would assist in making this happen. Since 2004 WRAP has been working in partnership with most local authorities in England and all those in Scotland to promote home composting and since the programme started, they have sold nearly 2 million home composting bins. Continued promotion of home composting to lift perception of organics and their beneficial properties to the wider public needs further promotion and encouragement at a National level. Since home composting is such an important part of bio-waste management, the Association recommends that there is a formalised reporting structure on its efficiency and diversion capacity across all member nations.

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4 http://www.wrap.org.uk/retail/courtauld_commitment/
4 Limiting Landfilling

4.1 It is widely recognised that the option of landfilling is the least environmentally sustainable solution and it is estimated that the UK has less than 7 yrs of landfill void left. The UK has reduced the amount it sends to landfill from 96 million tonnes in 1996 to 68 million tonnes in 2007/08. Household waste generation is comparatively constant at 28 million tonnes per annum. Many of the other Member States are less progressed in the reduction of landfill and continued enforcement measures will be necessary for some time to come.

Question 2: Do you see benefits or disadvantages of further restricting the amount of biodegradable waste that is allowed on landfills beyond the targets already set in the EU Landfill Directive? If yes, should this be done on a EU level or left to decide by Member States?

4.2 Each member state has a very different approach to the management of its bio-waste, both as a result of the stage of their development but also as a result of their imbedded infrastructure. The targets which have been set in the Landfill Directive are significantly demanding. Some of the Member States are finding very challenging to achieve these targets and would definitely struggle if stricter targets are set at European Level. Certainly the 2013 and 2020 targets for the UK will require a determination from Local Authorities to come close to achieving these.

4.3 Thus, the Association recommends that the current targets set in the Landfill Directive are kept and no stricter diversion targets are set for the time being.

4.4 However, better guidance should be provided by the Commission (for example, through a Bio-waste Directive) on where the bio-waste should go and how they should be managed properly. In addition, bio-waste recycling and source separation targets should be set to act as drivers for Member States to implement bio-waste management schemes.

4.5 The fact that these targets can be successful has been demonstrated in Sweden where there is a 35% recycling target for source separated food waste in place. This exerts significant pressure on delivery from a targeted area.

4.6 Eventually, setting of diversion targets should be left up to member states on the basis of the wide diversity of investment capability and affordability.

5 Treatment options for bio-waste diverted from landfill

5.1 As described in more detail in the answers to questions 3 and 4, there are a number of treatment options available for diverted bio-waste. The merits of these options will depend on a number of factors including location, costs, the composition of the feedstock that requires treatment and the funds available for treatment. In summary, there should be a move to promote pre-treatment and stabilisation of bio-waste prior to landfill, treatment options such as composting and technologies that recover the

5 Customs and excise returns
imbedded energy through AD and the subsequent production of biogas. There needs to be renewed emphasis placed by the Commission on the value of the composted or digested outputs and their high residual value.

**Question 3: Which options for the treatment of bio-waste diverted from landfills would you prefer to see strengthened and what would you see as their main benefits? Do you think that the choice of the treatment of bio-waste diverted from landfills should benefit from a wider and more consistent use of life-cycle assessment studies?**

5.2 There needs to be greater emphasis placed on the beneficial properties of compost and digestates and their use in improving soil health. The application of crop residues, organic fertilizers and soil improvers like composts and digestates with significant organic matter content is extremely important for replenishing the soil’s humus content, that enable its fertility and function. Regular applications of composts and digestates to soils can, over time, reverse the decline of organic matter in UK and European soils. This in turn is a vital part of sustainable agriculture and field horticulture.

5.3 There is currently some tie-in with soil management within the Single Farm Payment scheme which operates within the EU to promote good agricultural practice. This legislation requires further development to encourage greater use of bio-waste amendments in the farming sector. We are now much more aware of the beneficial properties of bio-wastes and their influence on soil and crop management; this needs further promotion through legislative drivers in order that greater volumes of bio-wastes are used in the agricultural and field horticultural sector.

5.4 There needs to be EU standards for carbon footprinting of logistics and end of life processing. Even though Life Cycle Analysis (LCA) is potentially an useful tool, the current LCA methodology are still relatively new and immature in their evolution and rarely consider or are able to quantify the benefits associated with carbon management issues and some of the secondary benefits such as soil fertility, reduced pesticide usage, improved workability and water holding capacity and carbon sequestration. The most significant benefits derived from use of organics come from soil remediation and their ability to improve soil function, sequester carbon and act as a substitute for finite growing media resources such as peat; such benefits cannot be neglected.

5.5 There are a number of options available for the treatment of bio-waste, some of these are regulatory driven as in the case of Animal By-Products compliance whilst others will be driven by the waste type and its suitability for treatment within a particular technology genre. It should be noted that treatment options available for bio-waste are wide ranging and flexible dependant on the context, this enables participation by a high number of stakeholders.

5.6 There is a need to develop a complementary approach to the use of different technologies. Clearly the processing of green waste and botanical arisings is best dealt through conventional open-air windrow facilities. Food waste and catering waste, will serve either in-vessel composting or anaerobic digestion plants more effectively. The driver here will rest with the collection authority as to what collection method they are adopting, i.e are they to co-mingle the food waste with their existing green waste collections from where it will most probably go to an IVC facility OR adopt a separate collection policy in order that the feedstock can be fed to an AD plant. Renewable
obligation Certificates (ROCs) are currently payable on new AD technologies, this may tend to favour this treatment option in the future over others such as IVC.

6 Improving energy recovery

6.1 Bio-waste management through anaerobic digestion has the inherent benefits of combining energy recovery with beneficial end of process outputs. There needs to be sufficient incentives in place to ensure that materials recycling and energy capture are encouraged and supported through treatment options that are most effective and least polluting in their impacts to human health and the environment. AD has the potential to produce between 150-200 m3 of methane from every tonne of bio-waste processed. Due to the speed of innovation and progression in AD technologies, additional benefits such as gas to grid will further enhance this method of energy recovery.

Question 4: Do you think that energy recovery from bio-waste can make a valuable contribution to sustainable resource and waste management in the EU and in meeting the EU’s renewable energy targets in a sustainable way and, if so, under which conditions?

6.2 The contribution of recovery will be decided primarily by market economics and energy availability going forward. If we are to move into carbon traded permit regimes/carbon taxes, then we need an EU wide assessment standard which can be applied across all member states.

6.3 There are three main avenues for recovering energy from bio-waste, these are

- thermal treatments including incineration with energy recovery, pyrolysis and gasification,
- anaerobic digestion followed by biogas cleaning and combustion through a CHP unit or adding gas directly to the grid which is the more favoured option, and
- combined heat and aerobic composting (CHAC).

6.4 The thermal option is in the opinion of the Association the least favoured option as it does not return any organic matter (OM) to the soils as the majority is oxidised during the thermal process. Loss of OM within European soils is a significant issue resulting in soil erosion and soil degradation.

6.5 AD does not readily decompose lignaceous and fibrous material but has the additional benefit of methane production which in turn can feed a CHP unit. However it should be noted that there is significant heat loss through AD. New AD facilities need to be encouraged to capture this heat loss. The promotion of use of both the digestate and liquor fractions post treatment need to be encouraged and promoted. In the UK this is being done through the development of an AD Quality Protocol, which will encourage the development and use of digestate and lift the ‘waste’ tag from the output when it leaves the point of full recovery (the AD plant). The Association would encourage the use of AD as one of the primary treatment options which will in most instances require a further aerobic stage to provide stability to the digestate.

6.6 Promoting organics to land is a prime source of recovery route for nutrients and organic matter. A further benefit is the provision of Phosphorous to soils, a much sought after
macro-nutrient and one that is in short supply. As mentioned previously, improved legislative drivers to promote bio-waste will be helpful.

6.7 The potential for energy recovery from bio-waste is currently significantly undervalued. Although there is greater realisation that this resource can be better exploited through the new double ROC allowance scheme offered for new technology AD plants, there needs to be increased emphasis placed on the development of district AD facilities in order that bio-waste arisings are used at a local level for district heating schemes. The UK is a long way behind the rest of Europe in adopting a holistic approach to waste management treatment and use of the embedded energy at a local level. This needs greater support from Government if it has any likelihood of succeeding, as the planning barriers will make this particularly difficult to achieve.

6.8 The use of oversize compost or the woody fraction of the compost feedstock for biomass is also a much undervalued product. A number of producers are starting to develop markets for this material within the biomass sector. As a waste this can only be combusted at WID compliant sites and there is a scarcity of these currently within the UK which restricts development of this market. There needs to be pressure placed on National regulators to change the status of this material in order that it is able to be combusted in non-WID compliant sites.

6.9 It is preferable to maintain the source segregated approach to bio-waste collection and capture the higher grade feedstock for AD plants as opposed to leaving the organic fraction to go through MBT facilities through residual collections of MSW. The latter option will normally mean that the organic fraction is removed and its subsequent use as a soil amendment is limited due to contaminant issues. MBT is still more favourable than landfill as the organic fraction can be bio-stabilised to reduce its subsequent emissions.

6.10 Incineration as an alternative option provides few benefits as most of the nutrients and organic matter are completely wasted. In addition it should be noted that the higher the percentage of bio-waste within a combustion chamber, then the lower the thermal efficiency achieved.

7 Increasing recycling

7.1 Much emphasis has been placed on this part of the waste hierarchy, particularly in the UK. In respect of bio-waste recycling, in excess of 3.7 million tonnes6 of material were treated through bio-waste processing facilities. This is set to continue as more effort is placed on the source segregated collection of food waste.

7.2 The Green Paper says that there are three main areas of activity which are interrelated and may require a unified approach in order to deliver the most benefit; these are:

- **Specific bio-waste collection targets** which will drive a more direct approach to capturing bio-waste arisings. This will need to be set at a national level as the rate of progress between member states is varied.

- **Standards for the production and use of composts and digestates**. This is imperative if member states are to promote the use of bio-wastes and build confidence in their use, particularly within the farming sector.

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6 AFOR State of composting in the UK 2006/07
o Separate collection obligation by all participating members. This will not only assist in the aim of producing ‘quality’ composts but will also promote investment in associated treatment technologies that will be using the feedstock further downstream.

**Question 5: Do you see a need for promoting bio-waste recycling (i.e. compost production or use on land of composted material) and, if so, how? How can synergies be achieved between bio-waste recycling and energy recovery? Please provide the necessary evidence.**

7.3 The Association highlights that the formation and implementation of a bio-waste Directive from the Commission is essential if member states are to implement improvements in the collection and treatment of biodegradable waste. This should be formulated in such a manner as to allow an element of flexibility by members to accommodate their individual needs but could act as a primary driver in establishing a minimum target at a European level.

7.4 Up to 40% of household waste comprises of a biodegradable fraction. As such it is the single largest fraction of the MSW stream that can be exploited to effective use through composting, anaerobic digestion or a combination of the two.

7.5 Domestic food and catering waste as well as commercial and industrial bio-waste have high water and energy content and, thus, represent a suitable feedstock for anaerobic digestion and biogas production. The viability and promotion of energy recovery through anaerobic digestion will be mainly dependant on energy costs in the future and the associated cost of extraction.

7.6 In addition, the collection of the biodegradable fraction from the residual waste stream enhances the calorific value of this material so improving its performance during incineration if this is the chosen disposal method.

7.7 Composting is another viable option, particularly for green waste only and co-mingled green and food waste. In the UK, large centralized composting sites as well as home composting, community, institution, Non-Governmental Organisations and on-farm composting sectors play an essential role in enhancing bio-waste recycling and encouraging a responsive and competitive industry.

7.8 Small scale and community composting sites fulfil an essential role in the development of the bio-waste management industry in the UK, especially within rural communities, inner city areas and other locations where it is difficult to collect and/or treat biodegradable materials. They offer real benefits to the local community both in terms of environmental benefits, but also in the building of community understanding of matters relating to bio-waste and resource management.

7.9 In addition, on-farm composting and anaerobic digestion play a vital role in sustainable agricultural systems by returning nutrients to the soil and arresting the decline in soil quality. These facilities are vital in providing local solutions to bio-waste resource management by following the proximity principle ethos. More recently with the escalating cost of artificial fertilizers the beneficial properties associated with both green waste and food waste derived composts have become of significant value to the farming
sector. There needs to be sufficient promotion of both small and large-scale facilities in order that the farming sector is not neglected.

7.10 The large centralized facilities are most likely to invest in a broad range of technologies due to their increased funding and revenue streams. There is probably more expansion at these facilities into energy recovery through AD than elsewhere due in part to the sites already having the necessary infrastructure, planning and permitting requirements to expand.

7.11 A potential synergy that composting offers is the provision of oversize compost or the woody fraction of the compost feedstock as a biomass feedstock. This is a much undervalued feedstock. A number of producers are starting to develop markets for this material within the biomass sector. As a waste, this can only be combusted at WID compliant sites and there is a scarcity of these currently within the UK which restricts development of this market.

8 Contributing to soil improvement

8.1 As highlighted in other areas of this paper, the Association strongly believes that the significant benefits of composts and digestates when used as a soil improver must continue to be highlighted and drivers put in place to promote this activity. The provision of organic material to land and the associated benefits needs to encompass a wide range of inputs which will in turn result in a range of standards looking something like this:

- **EU Quality Compost**: This would be viewed as fully recovered material and be described as a ‘product’ rather than a ‘waste’. This already happens in the UK through the PAS 100 and Quality Compost Protocol Certification Scheme7. Similar schemes need promotion within other member states to promote high quality compost. The UK will be launching later in the summer a similar scheme for digestate which will provide quality assurance to end users. The UK has found that building user confidence through this route has worked very well and aided in the development and growth of the sector.

- **EU Class II compost from source-segregated inputs**: This material would not meet the stringent standard set above and would be classified as a ‘waste’ and would therefore be regulated by the appropriate authority. This may be set at either a National or European level as there will be potentially some differences between member states. Use of this material would require a greater degree of control particularly in the agricultural and horticultural sectors due to potentially higher levels of pollutants such as heavy metals.

- **EU non source-segregated composted materials**: Composts which have been manufactured from mixed waste and are often referred to as ‘Compost-like Outputs’ or CLOs are generally of a lower quality and variable in their composition. These outputs will normally be used for land restoration, remediation and or landfill cover but not be suitable for use where edible crops are to be grown. This material is still of value and should not be excluded from use in a limited marketplace. The Association advocates that additional trials and research is required to progress this further.

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Question 6: In order to strengthen the use of compost/digestate:

- Should quality standards be set for compost as a product only or also for compost of lower quality still covered by the waste regime (e.g. for applications not linked to food production)?
- Should rules for the use of compost/digestate (e.g. limits on pollutant concentration in compost/digestate and land on which compost/digestate is applied) be set?
- Which pollutants and concentrations should these standards be based on?
- What are the arguments for/against the use of compost (digestate) from mixed waste?

8.2 It is imperative that composts and digestates are promoted and marketed as being safe, sustainable and free from the ‘waste’ tag wherever possible. Currently there is considerable disagreement within member states as to how this operates. The Joint Research Council (JRC) developed criteria for End-of-Waste Standards and made significant progress as to a possible solution. This reinforces the need for a bio-waste Directive. As proposed above, there also needs to be provision for lower quality materials often sourced from mixed waste as they can play a positive role in amending soils under certain circumstances.

8.3 There needs to be limit levels set for potential pollutants such as heavy metals, as these can under certain circumstances impact adversely on the environment. In the UK, PAS 100 and the Compost Quality Protocol sets strict limit levels as listed below:

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>REQUIREMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmonella spp</td>
<td>Absent in 25 g</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>≤ 1000 CFU / g</td>
</tr>
<tr>
<td>Cadmium</td>
<td>≤ 1.5 mg / kg DM</td>
</tr>
<tr>
<td>Chromium</td>
<td>≤ 100 mg / kg DM</td>
</tr>
<tr>
<td>Copper</td>
<td>≤ 200 mg / kg DM</td>
</tr>
<tr>
<td>Lead</td>
<td>≤ 200 mg / kg DM</td>
</tr>
<tr>
<td>Mercury</td>
<td>≤ 1 mg / kg DM</td>
</tr>
<tr>
<td>Nickel</td>
<td>≤ 50 mg / kg DM</td>
</tr>
<tr>
<td>Zinc</td>
<td>≤ 400 mg / kg DM</td>
</tr>
<tr>
<td>Stability / maturity</td>
<td>≤ 16 mg CO2 / g organic matter / day</td>
</tr>
<tr>
<td>Weed seeds &amp; propagules</td>
<td>0 / litre</td>
</tr>
<tr>
<td>Plant response</td>
<td>Germination reduced ≤ 20 % compared with controls</td>
</tr>
<tr>
<td></td>
<td>Plant mass above surface reduced ≤ 20 % compared with controls</td>
</tr>
<tr>
<td></td>
<td>No visible abnormalities</td>
</tr>
<tr>
<td>Total glass, metal and plastic &gt; 2 mm</td>
<td>≤ 0.5 % mass / mass of total air-dry sample (of which ≤ 0.25 % mass / mass of total is plastic) *</td>
</tr>
<tr>
<td>Stones and other consolidated mineral contaminants &gt; 4 mm</td>
<td>Mulch: ≤ 16 % mass / mass of total air-dry sample</td>
</tr>
<tr>
<td></td>
<td>Other product types: ≤ 8 % mass / mass of total air-dry sample</td>
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</tbody>
</table>
8.4 In the United Kingdom, compost that complies with the above minimum quality criteria and the other requirements of the PAS 100 and Quality Compost Protocol Certification Scheme is considered fully recovered. Therefore it is a product, not a waste, before it is used. For more information about the Certification Scheme, please see the Association’s web site www.organics-recycling.or.uk or contact the Association directly (+44 (0)870 1603270).

9 Contact details

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