

Getting it right to drive organics from landfills to material recycling Contribution from GAIA to the biowaste consultation of the European Commission

The fundamental question about biowaste in Europe is: which level of the waste hierarchy should be dealing with biowaste? GAIA's contribution will argue that biowaste should first be reduced, then used as food for animals, and then recycled in composting or anaerobic digestion processes. Therefore it belongs to material recycling level and we propose measures to lay out how to move biowaste management up the hierarchy where it belongs.

The European Commission rightly understood that biodegradables don't belong to landfills – where they create gases and odors- and the landfill directive successfully managed to progressively move biodegradables up the hierarchy.

Diverting organics from landfills should not incentivize incineration to compete with reuse, recycling and composting¹.

It is now time to promote recycling of biowaste and this can only be done by pushing biowaste up the hierarchy. Having targets for diversion of biodegradables from residual treatment –landfill and incineration- will steer biowaste treatment to the next level of the hierarchy and will trigger better separate collection, proper clean energy from biowaste via AD and will turn compost into a product.

GAIA welcomes the Green Paper but is concerned about its dangerous bias of promoting incineration as an acceptable way to treat biowaste. Such an approach:

- ✓ goes against the waste hierarchy –recycling is a step above incineration-,
- ✓ doesn't follow the European Soil Strategy in which returning carbon to the soils is a priority,
- ✓ promotes bad economics –doesn't take into account rising gate fees for incineration, the negative externalities of incineration on health and waste dependency, and the positive externalities of AD and composting in soil recuperation, fighting climate change, job creation and community building.

The organic fraction is the biggest in percentage and weight terms of the waste stream. Getting the organics out of the bin and turning them into compost can be one of the main contributions of EU waste legislation to radically reduce the residual part of the waste

¹ http://www.nabu.de/imperia/md/content/nabude/abfallpolitik/nabu-studie_muellverbrennungskapazitaeten.pdf

whilst radically cutting greenhouse emissions from landfills and fixing carbon in European soil, severely affected by the threat of desertification.

Energy from waste incineration continues the old-fashioned approach of linear throw-away society and encourages waste production. In contrast, clean energy from biowaste produced in anaerobic digesters and compost facilities is a change of paradigm since it goes in the direction of a systemic society where resources are not destroyed but transformed plus it doesn't create the environmental and health hazard posed by incineration.

Question 1:

Waste prevention is at the top of the EU's waste treatment hierarchy. From your experience, what could be specific biowaste prevention actions at EU level?

Prevention in waste generation is two-folded:

A- give facilities and incentives to citizens to reduce the biodegradable waste they produce.

B- give competent authorities the right message and tools so that they have a motivation to prevent biodegradable waste and doesn't make them dependent on waste generation.

A- How to give facilities and incentives to citizens to reduce the biodegradable waste they produce?

Home composting has an unrealized potential to reduce the waste generation per capita, reducing collection and treatment costs and having a substantial good environmental impact. The EU should make mandatory that home composting is included in the waste management plans requested by the Waste Framework Directive.

The communications of the European Commission about environment should include support of the EU to home composting.

Awareness campaigns prove to be very useful to reduce biowaste output but also to provide the right treatment of biowaste. Examples: WRAP in the UK², ARC in Catalonia³...

B- How to give competent authorities the right message and tools so that they have a motivation to prevent biodegradable waste

Turning the pyramid of the waste hierarchy upside down and give appropriate tools to each step. Funding is a good sign of policy priority.

Prevention is claimed to be the most important step in the waste hierarchy and therefore its priority should be proportionally granted with funds. Currently 68% of European

² http://www.wrap.org.uk/retail/food_waste/index.html

³ http://www20.gencat.cat/docs/Sala%20de%20Premsa/Documents/Arxius/mah_prensa.notaPremsa.83.Anunci1227529057337.pdf

funds⁴ go to finance incineration (992,6 million €) and only 2% (30 million €) for composting plant and 1% (17 million €) for sorting centers for recycling.

This sends the wrong signals when we talk about prevention. When no money is spent in prevention or recycling facilities and instead incinerators are built which will be dependent on waste generation –including biodegradables- it can't be a surprise that biodegradables are not recycled.

Therefore a first step for prevention is reducing the capacity of disposal so that biodegradables don't just "disappear". Flanders is a successful example of how restricting incineration capacity (through the use of gate fees, targets, etc.), when combined with the right information, home composting, separate collection and appropriate treatment facilities efficiently prevents waste.

Sending the right **message**: the message of the European Commission is always ambiguous about the priority treatment for biowaste⁵. The European Union should be consistent with itself⁶ and clearly state that biowaste should be composted, carbon put back in the soils and energy recuperated with Anaerobic Digesters. To put it bluntly, the Commission should follow the Waste Hierarchy.

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 EU level or left to decide by Member States?

The turning point of recycling biodegradables is to be found in the treatment of residuals.

If biowaste is to be recycled it needs to be forced up the hierarchy. The Landfill directive is the best example of how binding diversion targets are useful to shift a waste stream like biowaste up in the hierarchy. However, the European Commission is ignoring the other disposal option: incineration. The result is that the biowaste that leaves the landfills instead of ending up recycled it ends up being burned. The evidence of this is visible in those countries implementing the landfill directive: while the percentage of biodegradables to landfills decreased, the percentage of composted biowaste increased only very marginally. Where does this biowaste go? It stays in the level in between and ends up burned. This is neither environmentally sensible nor energy efficient.

Hence, it is vital that there is a **progressive ban at EU level of burning biodegradables**. The landfill directive shows the path and the tool on how to shift biowaste up the

⁴ http://bankwatch.org/documents/fuelling_the_fire.pdf 68 % of the EIB's lending to the waste sector over the 2002-2006 period went to incinerator projects (EUR 992.6 million) only EUR 30 million of EIB finance in the period went for composting, for one project, and EUR 17 million for two sorting centres for recycling.

⁵ Whilst reports from the EC confirm the need to sequester carbon in soils to fight climate change, the EU continues to consider incineration as a biowaste treatment technique.

⁶ <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/353>

hierarchy. If the Commission is serious about the importance of recycling biowaste it is vital to put a ban of biodegradables in incinerators.

Reduce the biodegradable waste going to incineration to:

75% of figures of 2009 by 2012

50% of figures of 2009 by 2015

25% of figures of 2009 by 2020

0% incineration of biodegradables by 2025

By simply pushing the obligation to progressively get biodegradables out of landfills and incineration the EU would have a simple, easy to implement and effective driver to push competent authorities to put in place ambitious separate collection schemes and adequate treatment facilities for biowaste.

GAIA thinks that this point should be paramount for the EC initiative to promote an EU biowaste strategy.

Question 3:

Which options for the treatment of biowaste 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 biowaste diverted from landfills should benefit from a wider and more consistent use of life-cycle assessment studies?

The Waste hierarchy should be respected. It has been proven that recycling and composting are better for waste and biowaste recycling than incineration. The new waste hierarchy reflects this and the a new Biowaste Directive should take it into account.

The most advanced European countries in composting give a clear priority to composting. A LCA study comparing incineration and composting in the Netherlands⁷ shows the advantage of compost from the sustainability and climate change point of view.

From the business and financial point of view Anaerobic Digestion, Vermicomposting, home composting and composting offer big advantages over incineration.

- ✓ **Anaerobic Digesters** are flexible, quick to build, less capital intensive, cheaper and with the green electricity and heat produced can pay back investment in 5 years⁸ -this is not taking into account the value of the remaining digestate in terms of GHG and fertilisers savings-.
- ✓ **Municipal Composting** reduces the amount of waste sent to disposal and eases sorting of residuals. It has low capital intensity, it creates jobs and it involves the community.

⁷ R.J. Saft and W. Elsinga, BioCycle August 2006, Vol. 47, No. 8, p. 50 - Eco-Indicator 99 - showing gains for the environment when source separating and composting kitchen and garden waste versus incineration

⁸ CADDET, Centre for Renewable Energy, ETSU, Harwell Oxfordshire OX11 0RA, UK - Anaerobic Digestion of Farm Waste in the UK

- ✓ **Vermicomposting** bring in the possibility to get quality compost when organics are separated or get compost out of mixed waste and hence make it easier to recycle the residuals.
- ✓ **Home composting** is inexpensive and it reduces waste collection, transport and treatment costs.

Clean biowaste inputs are crucial, hence separate collection is crucial for an appropriate treatment of biowaste. Door-to-door collection has proven to be the most effective and quick way to boost composting⁹.

As regards Life Cycle Studies GAIA understands that they can be useful, however it is important to take into account that LCA tend to be blind to the positive soil related externalities of composting. The next 20 years are going to be crucial for the planet as regards climate change impacts and the need to fix carbon in the soils is therefore urgent.

Recycling of biowaste has many additional benefits relative to disposal:

- negligible methane emissions
- short to medium-term carbon sequestration. Although compost does not permanently sequester carbon (it remains part of the biologically active ecosphere), it does increase the portion of carbon which is stored at any given point in time. This can have significant climatic benefits, especially in light of scientists' warning of a tipping point in the global climate in the next 10 to 20 years.
- improved soil structure. When compost is added to soil, it improves the workability of the soil, thus improving its ability to hold water. This reduces demand for irrigation water and can dramatically reduce agricultural energy demands, as the pumping of irrigation water is a major consumer of energy. Improved soil structure is also easier to work, requiring less energy expended in ploughing.
- displaces synthetic fertilizers. Compost reduces or eliminates the need for synthetic fertilizers which are, among other issues, extremely energy-intensive to produce. As a non-chemical based fertilizer, compost is also compatible with organic agriculture, which yields much higher-value crops than conventional agriculture.
- since biowaste is the largest single fraction of the municipal waste stream, removing biowaste from the residual fraction will cause a dramatic decrease in the infrastructure and expenditure needed to handle the residual.
- for all the above reasons, biowaste recycling produces a fraction of the greenhouse gases which are produced by disposal (incineration or landfilling).

Question 4:

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

⁹ Gelabert, Manual de recollida selectiva a Catalunya, Associacio Catalan de Municipis Porta a Porta

Energy recovery from biowaste can make a valuable contribution to sustainable resource management in the EU but a reshuffle of European Commission's understanding of energy from biowaste is necessary.

Biowaste has a high moisture content and hence the energy that can be extracted from it is limited however it has a lot more potential as "energy saver" when we consider the effects of compost in the soils by avoiding desertification or the replacement of fertilizers that need energy to be produced.

As regards energy recovery from biowaste in waste to energy incinerators, there is no such a thing more far away from reality. Firstly, efficient energy recovery is directly proportional to the calorific value of waste, if biowaste –wet fraction, 70-80% water- is removed calorific value increases and hence energy generation is more efficient and secondly if biowaste is removed the temperature in the furnace jumps from 850 degrees to 1500 which produces more energy.

As the Dutch waste expert Jan Boone¹⁰ puts it "...there is nothing more stupid than an incinerator that burns biowaste".

During the Waste Framework Directive negotiations the European Commission argued that it was important to get energy efficiency from incinerators. The best way to achieve it is by removing biowaste from the furnaces with a progressive ban and laying the measures for appropriate and clean biowaste management.

Where biowaste is used directly for energy production, it should take place through anaerobic digestion. Anaerobic digestion manages a clean, source-separated biowaste stream with accelerated decomposition in a controlled, fully contained system, without the fugitive emissions problems of landfills. Anaerobic digestion produces a gas rich in methane which can be burned for direct heat or to produce electricity. It is considered a form of recycling because the solid digestate that is produced at the end of the process is suitable for application to food-producing agricultural soil. As with composting, this requires source separation of biowaste to avoid contamination of the final product.

Question 5:

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

The crucial step in promoting biowaste recycling is to mandate separate collection of biowaste. This can only be done by government, not the private sector; it requires the establishment of a multi-stream source collection system and public education to ensure that the biowaste is not contaminated. A clean, source-separated stream of biowaste opens the possibility of large-scale biowaste recycling, with its concomitant economic and environmental benefits. However, there can be no effective recycling of biowaste

¹⁰ Mr Jan Boone is the Major stakeholder of VAR and World Wide Recycling BV

which is contaminated with residuals. Therefore, it is imperative that governments organize systems for separate collection of biowaste.

Biowaste represents between 25 and 50% of MSW, it is therefore crucial to promote the right treatment of this waste stream for it has the potential not only to reduce the amount of waste for disposal but also to reduce the amount of waste generated.

Multiple successful experiences from Europe but also from the rest of the world such as California in the US, Nova Scotia in Canada or New Zealand prove that in order to promote recycling of biowaste it is mandatory to introduce drivers that not only make recycling possible but also push the actors to recycle.

Making recycling possible means offering the possibility that a recycling industry is developed by forcing a continuous supply of quality material. The experience shows that currently in Europe the countries that either have not legislated on biowaste or have not given facilities to the compost market to develop, have stayed with ridiculously low biowaste recycling figures.

On the other hand experience of European legislation shows that only with quantitative and/or qualitative targets it has been possible to steer the waste.

The packaging or the landfill directive proves the effects of targets. As mentioned in Q2 we ask the European Commission to take the example of the landfill directive and progressively ban biowaste from incinerators which we believe will steer the biowaste up the hierarchy. This can be complemented with concrete separate collection targets for biowaste kg/year.

As regards synergies between biowaste recycling and energy recovery, in Q3 and Q4 we have already argued why energy from waste can be obtained from Anaerobic Digestion and incineration should not even be considered.

Question 6:

In order to strengthen the use of compost/digestate:

a) 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)?

Quality standards should be developed for compost. However, it is important to create at least two distinctive quality levels; one for clean compost, coming from source separation and which can be used as soil improver and one for “dirty” compost coming from mixed waste and which is useful to reduce volume in landfills –once stabilized-, retain water, sequester carbon and generate renewable energy in anaerobic digesters.

b) 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 ?

GAIA supports EU-wide standards for quality of compost. Experiences of other places in the world show the importance of these. For instance in the US the US Composting Council has set standards for quality of compost products. These have worked well to establish a protocol for testing compost products¹¹.

c) Which pollutants and concentrations should these standards be based on?

The pollutants concentrations should be based on safety. Heavy metals, pathogens, organic contaminants and plastics should be taken into account. Generally speaking if good separate collection is in place the safety of the compost is guaranteed, however when dealing with compost from MBT or mixed waste it is especially important to have these safety measures for heavy metals and plastic contaminants.

d) What are the arguments for/against the use of compost (digestate) from mixed waste?

Composting of mixed waste is appropriate only to stabilize it before landfilling; compost/digestate from mixed waste should not be applied to agricultural land as it will contaminate the land, possibly the food supply and even the water table. Unless this distinction is clearly established, farmers may be reluctant to use compost/digestate on their lands, which will negatively impact the market for all compost/digestate. It is therefore important that mixed waste compost/digestate not be permitted for re-use.

Question 7:

Is there any evidence of gaps in the existing regulatory framework concerning the operational standards for plants which do not fall under the IPPC scope and if so, how should this be addressed?

Whilst IPPC covers mainly big industrial activities, composting offers the possibility to work at different scales; from anaerobic digesters and composting facilities which fall in the category “industrial activity” to small scale when home-composting, community composting and rural composting. It is important that a proper assessment is done about the compost sector in order to provide the necessary flexibility to allow decentralized and flexible small-scale systems whilst properly monitoring big-scale composting facilities and anaerobic digesters.

Question 8:

¹¹ Stuart Buckner, Ph.D. | Executive Director, www.compostingcouncil.org

What are the advantages and disadvantages of the abovementioned biowaste management techniques? Do you see regulatory obstacle preventing the further developments and introduction of these techniques?

The advantages and disadvantages of the different biowaste management techniques have been tackled in Q2, Q3 and Q4. Summarised in a table:

	Composting	Anaerobic digestion	Home composting	Incineration with energy recovery
GHG impact	Very positive	Positive	Positive	Negative
Health risk	Very low	Very low	Very low	Considerable
Energy efficiency	---	Medium	---	Negative
Net energy generation	Low	Medium	---	Very Low (unless burned with mixed waste)
Externalities on soil, education, treatment of other waste streams	Very positive	Very positive	Very positive	Negative
Flexibility	High	High	High	Very low
Investment	Medium/low	Low	Low	Very high
Capital intensity	Medium	Medium	Low	Very high
Return of investment	10 years	5-10 years	---	30-40 years

As regards regulatory obstacles preventing composting, anaerobic digestion or home composting we find the upgrade of incineration in the waste hierarchy of the recently approved Waste Framework Directive. This is because the only message that seems to have reached the member states, rather than the continued higher priorities of waste prevention, recycling and composting is the green light to incineration. In Madrid and Guipuzkoa in Spain, in Campania and Sicily in Italy or in Krakow and Warsaw in Poland the new directive is only quoted to justify new incinerators. In none of the cases a serious separate collection scheme is planned and compost is just not discussed.

The current EU legislation on waste clearly doesn't encourage composting and it clearly favours biowaste being burned. A progressive ban on incineration of biowaste would level the playing field for recycling biowaste and result in valuable nutrients returned to the soil, healthier air, and lower greenhouse gas emissions which is what the European Commission identifies as its own aim¹².

¹² <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/353>