

Does EU waste legislation comply with the best available MBT technologies?

Indrek Paal

Ecocleaner LLC, Tallinn, Estonia

Abstract:

My presentation is driven by the rejecting attitude we have faced during the establishing process of the very first mixed municipal solid wastes MBT terminal in the Baltic states. During the preparatory phase of the presentation, the presumable cause for the doubts of local Estonian officials became evident – sorry to say, but it all starts from the existing and emerging European legislation. MBT technology, especially processing mixed solid wastes and the subsequent products is described in a number of EU documents that regulate waste handling in a manner that allows them to be held an evolutionary dead-end, if desired. Ecocleaner has been engaged in investigating MBT problems for four years. We operate the Baltic first mixed municipal solid wastes MBT terminal since the 1st of January, 2008. The aim of the presentation is to introduce a possible utilization field that is already tested in practice, and the associated problems.

Keywords:

Municipal Solid Waste & MBT vs Composting & separately collected biowaste

1 Green Paper

1.1 One of the EU waste management basic documents “Green Paper”

... deals with MBT only in connection with operations that are carried out before landfilling mixed solid wastes. The preamble of the legal instrument declares that the strategic target of the EU is turning the EU population into a resource efficient and waste recycling society. At the same time, Articles 3.1 and 4.1 describe a mixed solid waste MBT as a very limited means of waste management. Green Paper instructs to increase sorted waste collection, as the biowastes collected this way are cleaner so that high quality compost or biogas could be produced. It is positive that landfilling is regarded the worst waste management ever and implementing waste hierarchy is underlined as essential.

2 End of Waste Criteria Final Report– Compost Case Study

2.1 Treatment Options

The other EU waste handling document defines the MBT status of mixed solid wastes once again declaring that usually it is not possible to produce quality compost from mixed solid wastes. We would eliminate much of the confusion and misunderstanding if waste handling legislation defined that not only quality compost producing is essential concerning biowaste separate collecting, as for maximal recycling/recovery possibilities of components in mixed solid wastes. As for municipal waste mass components recycling and from the economic point of view, there do exist other equivalent or better solutions.

As regards the environmental as well as the economic aspect, it is important, most essential that hazardous wastes must always be separated from municipal wastes and separately collected biowastes and the management must be more efficient. As for activating raw material reuse and recovery markets, it is important to notice that establishing uniform quality parameters for and supervision over treatment processes of potential secondary raw material products, produced from processed wastes, using whatever methods, including those of inferior quality at a first glance – will enhance trust towards them and create markets for them.

3 What is MBT?

There are a number of versions and perceptions about the Mechanical Biological Treatment, caused by traditions, laws and technical possibilities and ideas. This number is too big! Officials and practitioners often miss the point and it seems that neither party is able to understand the other one.

4 Compost from green waste or MSW

It is completely obvious that during the biodegradation processes there are no ways for plastics, glass or heavy metal residues to be added to the mass. The initial compost mass contains these materials, so such ingredients are included from the very beginning. The fact is that compost enterprises in Germany that have for decades processed biowastes, collected separately, get after producing high quality compost 20 – 60% such slug that could only be incinerated or simply landfilled. The pictures show biodegradable wastes, collected separately in Estonia – left, and the right one shows

the MSW. The structure and moisture content of these two materials makes the difference. Based on experiments performed by scientists in Dresden Technical University and my personal experiences, I would state that it is easier to biodegrade the material shown right because oxygen access and water absorption structure, the composition of material and the carbon/nitrogen ratio is better there. I call your attention to the research work ADEME about compost markets in France. There are practically no differences in composts and growing substrates costs but the majority would like to consume them at 0-price.

Caption 1. Separately collected biowaste (left) and municipal solid waste.

5 MBT vs Composting

Although I do not see any difference in these operations as they cannot be separated, the Green Paper considers composting as treatment of separately collected biowastes and MBT as treatment of mixed municipal solid wastes. Still I will try to show the efficiency of the two different approaches in the table below. The given sample is based on Estonian enterprises. In order to achieve the same waste input volume by container composting, at least three up to five times the sum has to be invested. In an Estonian landfill where separately collected biowastes are treated by means of Envicont C900, about 20 000 tons of mixed solid wastes are deposited a year. In spite of the fact that biowastes have been separately collected in the area for several years, there have not been managed to collect it over 1000 tons per year.

Table 1. Comprasion of Ecocleaner MBT and composting container investment costs.

Parameter	High Quality Compost	MSW treatment	Territory in use for biodegration	Incoming quantity per year	Outgoing quantity per year	Investment costs /EUR
MBT with D.O.M.E method	Yes, depends on input material	Yes, main activity	2 ha	up to 35 000 Mt	ca. 60% SRF, ca. 15% Soil Improver, ca 25% CO ₂ +H ₂ O	1.5 Mio
Composting with Envicont in-vessel container	Yes, depends on input material	No, landfilling	1,5 ha*	1000 Mt	Up to 60% Fine Compost Residue for landfilling	0.4 Mio

* territory in use for after rotting process with maximum treatment potential up to 5000 mt p.a.



Caption 2. MBT with D.O.M.E. method and Envicont C900 composting container.

6 Waste separate collection and MBT

European Union law promotes separate collecting and composting of biowastes and considers the mixed solid wastes MBT technology and its products as low potential matters. The chain of collecting biodegradable wastes by categories is economically more expensive and less effective as it brings about the need for emptying several trashcans at different time (several logistical circles) and composting the material is expensive. Sorted waste collecting is the right approach to waste management in its essence as it enables in most cases to get pure material for recovery operations. Taking into account total expenses, waste collecting by all categories is not the most resources sustainable utilization at all. Estonian experience show that separate collecting of biowastes is uneconomical. Lots of other scraps are thrown into the material and the composting production cost is expensive due to the small amount of wastes located at distant sites in our low density areas. Sorted waste collecting plays an important role in reducing the amount of dangerous wastes that get into mixed solid wastes. According to Estonian Environmental Ministry research completed in September 2008, there could be up to 2% of such supplements.

7 Most cost effective BMT

Ecocleaner develops new BMT (Biological Mechanical Treatment) principles, being extremely cost-effective but at the same time, having quite simple structure and being environmental friendly. The next generation BMT technology aims for not only production of SRF fuel but re-utilisation of maximum of the volume of the material. Depending on SRF fuel certificate and the possible usage, the BMT technology waste recycling rate may reach up to 100%. Ecocleaner operates the BMT, practising covered stacks D.O.M.E aeration method for biodegradation processes, developed in Dresden

University and in use in several places throughout Germany. The effectiveness of Ecocleaner BMT is based on performing rational treatment operations that minimize the number of operations (moves) necessary for getting the result. Operational expenses are minimized as the material needs no mixing (turning) during the rotting process and the ventilation does not consume any energy.

7.1 Ecocleaner BMT modul principe – two stages

I will give you an example of how MBT technology would provide real savings. Today, Ecocleaner operates one MBT terminal in Eastern Estonia – that could be named the first MBT stage – biodegradation and mechanical sorting and crushing of part of material are the procedures performed there. Additional three terminals are to be built within a year, located in a way that they would be as near as possible to the Eastern and South-Eastern low-density area waste produces. The second MBT process stage – fragmentation and refining of SRF fuel – is centralised and located within reach from a potential fuel consumer, Kunda Nordic Cement, an enterprise that belongs to the Heidelberg Group. There are ca 240 000 people living in the service area of the terminals in Eastern Estonia and respectively ca 250,000 in the South Estonia. The four terminals are calculated to treat 100,000 tons of municipal wastes a year. The haul distance of fresh wastes (humidity 50-70%) should not exceed 50 km and that of processed raw waste fuel (humidity avg 25%) 250 km. In the coming years, landfills and waste disposal will be our main competitors.

Caption 3. Map of Estonia and Ecocleaner MBT terminals location

7.2 SRF

The main product of BMT terminal, which outcome is up to 60 % of the volume of incoming wastes – is SRF fuel, parameters confirming with criteria of solid recovered fuels certificate CEN/TS 15359:2006, 3rd fuel class that is suitable for co-incineration in cement incinerators.

7.3 Soil Improver

The purpose of BMT terminal is not only to produce SRF fuel but some growing media as well. If the need occurs, the first stage of the terminal may also produce quality compost, provided that local governments arrange waste management so that

necessary volume of separately collected biowastes for producing quality compost would be collected.

Subsequently, I would like to call your attention to the analyses of the compost which we produce from mixed solid wastes (MSW). European Commission Decision No 2007/64/EC of 15 December 2006 provides reference data. Figures in the table show that parameters of MSW produced soil improver comply with most of the required compost parameters. Ecocleaner would not be able to meet the quantity demand for soil improver presented in the table up to the year 2014 as Estonia will undergo an intensive process of recultivating landfills not yet meeting the requirements of EU Landfill Directive. We have actively started designing our product standard and certification process that will enable to expand the utilization field of the soil improver (producing fertile soil for exhausted quarry lands, peat bogs, industrial production sites, cultivation soil used in road building).



Caption 4. Ecocleaner Soil Improver 20 mm fraction, made 2009, Feb.

Table 2. Ecocleaner soil improver analyses.

Parameter/ Result	Ecocleaner	2007/64/EC Commission decision of 16 Dec 2006
Cu mg/kg	135	100
Cd mg/kg	1.50	1.0
Pb mg/kg	97.2	100
Hg mg/kg	0.344	1
Ni mg/kg	40.4	50
E.Coli 1g, MPN	48	1000
Salmonella 25 g	Absent	Absent

Helminth Ova 1,5g	Absent	Absent
-------------------	--------	--------

8 EU laws enable to deny the utility of MBT

All aforementioned was targeted at calling your attention to the fact that the significant EU laws concerning waste management enable to deny the utility of MBT in treatment of mixed municipal solid wastes.

- Article 33 of Waste directive 2008/98/EC states that mixed municipal waste remains waste even when it has been subject to a waste treatment operation that has not substantially altered its properties. The statement gives a cause for regarding the compost produced from mixed municipal waste always as waste with very limited utilization field (the best available case – to be used for covering landfills).
- Today, MBT of MSW is considered to be a questionable technological solution in Estonia.
- Sorted collecting is a necessary and important means in waste management, enabling to get clean materials in order to facilitate the recycling process. But more important than to collect biowastes separately is to reduce the proportion of hazardous wastes in the mixed municipal wastes.
- Despite the EU basic rule – waste hierarchy – the Estonian Parliament processes a draft of legislation which enables to create additional “sure” waste handling solutions for European Union funding to Estonia – establishing of two brand new landfills and expansion of existing five landfills deposit areas.

9 Literature

Archer, E; Baddeley, A.; 2005
Schwager, J.; Whiting, K.

Mechanical-Biological-Treatment: A Guide for Decision Makers, Processes, Policies & Markets. Juniper Consultancy Services Ltd. www.juniper.co.uk

European Commission 2006

COMMISSION DECISION of 15 December 2006 establishing revised ecological criteria and the related assessment and verification requirements for the award of the Community eco-label to growing media (2007/64/EC)

European Commission Joint Research Centre Institute for Prospective Technological Solutions	2008	End of waste criteria. Final report. European Communities. ISSN 1018-5593
European Commission	2008	Green Paper on the management of bio-waste in the European Union. {SEC(2008) 2936}. Brussels, 3.12.2008. COM(2008) 811 final
The European Parliament and the Council of the European Union	2008	DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 November 2008 on waste and repealing certain Directives

Author's address:

Indrek Paal, Tommy Biene

Ecocleaner LLC

Peterburi road 81

Tallinn 11415, Estonia

Tel. +372 6350232

Fax +372 6351985

Email ecocleaner@ecocleaner.ee

Website: www.ecocleaner.ee