

## SUMMARY OF FINDINGS

### STRIVE Report No. 16

#### **Critical Analysis of the Potential of Mechanical Biological treatment for Irish Waste Management**

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Fehily Timoney and Company (FTC), with assistance from project partners Rambøll (Denmark) and Veolia Environmental Services UK, have produced a report which investigates the potential role that mechanical biological treatment (MBT) of waste can play within the Irish waste management sector. The project findings are based on both desktop and field studies of the existing MBT situation within the EU, using operational performance data provided by project partners on several established European and U.K. MBT facilities.

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### **Background**

Mechanical Biological Treatment (MBT) is a waste treatment concept that has grown into a dynamic industry on mainland Europe since the 1980s. It evolved from a need in the face of changing legislative requirements to develop a method for treating residual municipal solid waste (MSW) material, and thereby reduce the need for traditional landfill disposal. The wide-ranging term MBT encompasses a broad range of distinct technologies that can be combined to treat residual municipal solid waste, typically at the same facility.

The aims of this project were to:

- Provide information in relation to MBT that may inform future government policy.

- Identify issues that require addressing in order to establish conditions that are suitable to the environmental development of MBT facilities in Ireland.
- Identify issues that require addressing in order to establish conditions that are suitable to the economic development of MBT facilities in Ireland.
- Make recommendations where possible as to the means to address these issues.

### Key Points

A variety of legislation must be adhered to in the development of an MBT facility (physical planning, veterinary controls, renewable energy, thermal treatment, soil protection and integrated environmental protection legislation).

If MBT is to be considered as a waste treatment technology to reduce Ireland's dependency on landfill, it is recommended that national standards be developed to:

- Govern the operation of MBT facilities in addition to EPA licensing
- Determine the biodegradability or stability of the treated biological fraction of residual waste;
- Develop quality standards to categorise the outputs from the 'mechanical' treatment phase;
- Determine appropriate outlets for the management of stabilised biowaste and the outputs from the mechanical treatment phase;
- Establish revised waste acceptance criteria for landfilling.

The current waste management plans were assessed to fully determining the role that MBT could play in each region. While seven of the ten waste management regions indicate a preference for thermal treatment as the primary residual waste management solution, eight regions also indicate that MBT can play a role in the treatment of residual waste, particularly in the short term where thermal capacity may not be available. The Cork region, in particular, has shown a clear preference for MBT of residual waste.

MBT has a potential role to play in the achievement of targets and objectives in relation to renewable energy and greenhouse gas emissions.

The contribution that MBT can make to assist Ireland comply to the diversion targets for biodegradable waste from landfill coming years is dependant on waste composition of the residual waste stream. The residual waste composition will ultimately reflect the effectiveness of the collection regime, demographics, user charge mechanisms, as well as social and economic factors.

Five facilities were selected as exemplar case study plants on the basis of the core biological treatment applied to the organic fraction and represent a broad range of the types of configurations used in MBT facilities throughout Europe. Information on each particular facility was collated as part of the technical review of these facilities. The outcome of the comparison of flagship facilities suggests that a combination of aerobic and anaerobic biological treatments may be the most effective way of treating the organic fraction of the input waste to achieve a respiration activity indicative of a suitable degree of stabilisation.

A comparative environmental assessment was carried out using the UK Environment Agency's WRATE Life Cycle Assessment (LCA) model to quantify and compare the environmental aspects of a MBT-based waste management system in context with an incineration-centric waste management system. The results of the analysis show that for the majority of impact categories, the treatment of residual waste with MBT or thermal treatment provides a net environmental benefit over landfilling of untreated MSW, provided that the systems employ efficient energy recovery and a significant rate of recycling is achieved.

Based on the assumptions outlined in the main report, it appears that MBT over the life of a project is more expensive than incineration-centric waste management as a residual waste treatment technology. However, the investment cost is highest for incineration-centric waste management whereas the cost of operation is highest for MBT.

There are generally three to four outputs from MBT, namely:

- Stabilised organic fraction,
- Solid recovered fuel product,
- Ferrous/non ferrous metallic outputs,
- Anaerobic digestion biogas (if anaerobic digestion is employed as part of the treatment process).

A detailed identification and assessment of long-term sustainable outlets for the management of these outputs was presented in the report.

Successful implementation of any multi-faceted waste management system that focuses on a high degree of waste recovery and minimum landfilling requires a highly well-organised and regulated waste management sector.

### **Concluding Remarks**

In short MBT is a flexible treatment option and can play a role in Irish Waste management. The report provides detailed information in relation to MBT that will inform future government policy.

### **For Further Information**

The full report '*Critical Analysis of the Potential of Mechanical Biological Treatment for Irish waste Management*' by B. Guinan et al. is published by the Environmental Protection Agency and is available at

<http://www.epa.ie/downloads/pubs/research/waste/name,25535,en.html>