

# Mechanical Biological Treatment of wastes: overcoming barriers and reducing risk in the UK

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## BACKGROUND

### Key driver: EU Landfill directive

- Implementation of Article 5 of the Landfill Directive via the Landfill Allowance Trading Scheme (LATS) in the UK
- Requires individual Local Authorities (LAs) to progressively divert biodegradable waste from landfill – targets have been set by central government
- If LAs do not meet their targets: fined at £150 per tonne of waste



### Where will the waste go? Need for additional waste treatment capacity

- Municipal waste production is currently increasing at around 3% per year in the UK
- Urgent need for additional waste treatment capacity. Environmental Services Association: "[...] with 2% annual waste growth, UK will need to divert about 12 million tonnes of BMW from landfill by 31 March 2010"
- Energy-from-Waste still faces strong public opposition in the UK, resulting at least in long lead-in times

### Mechanical Biological Treatment: promising for the UK

- Interest in the UK for MBT was initially raised by NGOs like Greenpeace
- Juniper consultancy's report on the state-of-the-art of MBT in UK context: "MBT is an important option for the waste management sector"
- Ends Report's account of Juniper's report: "MBT alone 'might' meet council landfill targets"
- Certain LA waste strategies indicate MBT as a preferable option
- Defra energetically seeks to inform LAs on MBT option

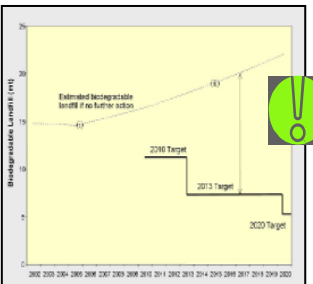


Figure 1. Biodegradable waste arisings and national targets for the UK 2002-2020



Figure 2. Example of European MBT plant

## AIM

This research includes two related projects for which the aim is to support widespread adoption of MBT in the UK, with **main objectives**:

- ⊗ Generate the fundamental process science and technology required, including bio-stabilisation, anaerobic digestion and thermal processing
- ⊗ Inform by data generation and appropriate analytical tools application a robust, holistic environmental performance appraisal of MBT plants
- ⊗ Deliver sound, quantitative data on SRF use, to help business cases for collaborative investments: waste industry – power generators partnerships

## METHODS

- ⊗ In-depth critical literature review, including peer reviewed and grey data; researchers' interviews; site visits
- ⊗ Emission and product related data from the first operational commercial MBT UK facilities
- ⊗ Co-combustion studies for SRF utilisation on pilot plant scale
- ⊗ Mass and energy balance studies - modelling
- ⊗ Cost-benefit analysis of selected options
- ⊗ Results expressed in readily usable form for (1). Risk assessment tools and, (2). LCA models
- ⊗ Scientific publications and dissemination workshop



Figure 4. Example of bio-filtration at European MBT plant

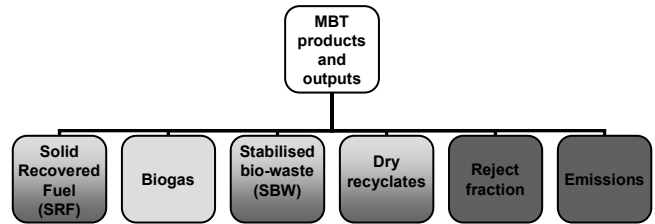


Figure 3. Products and outputs from MBT processes

## CONCLUSIONS

Preliminary literature review on MBT indicated possible **significant barriers** to the adoption in the UK. Further research is needed to address these uncertainties and reduce associated risks.



Policy – legal	Technical
No clear EU guidance: abandoned Bio-waste directive – forthcoming Soil directive?	Optimisation for both (1) human health – environmental – ecological risk management and (2) product – revenue generation
New biodegradability monitoring standards by Environment Agency (EA): practical implementation?	MBT processes adaptation on UK feedstock Technical suitability of SRF for a series of co-combustion applications
Actual contribution towards LATS and Best Value Performance Indicators (BVPI) targets?	Data needed on MBT emissions – suitable control technologies: bio-filters or regenerative thermal oxidation (RTO)?
Solid recovered fuel (SRF): CEN standards ongoing consultation – SRF eligibility for Renewables Obligation Certificates (ROCs)	Effective and efficient techniques and requirements for the input and products characterisation?
Stabilised bio-waste (SBW): when land application is recovery?	No detailed / elemental mass balance studies: fate of contaminants?
Public acceptability – position in emerging UK regional strategies	Best available techniques (BATs) for MBT plants?
Market – financial	Decision-making
Existence / development of viable markets for the MBT outputs: SRF, compost-like output (CLO) etc?	Risk assessment framework and data availability for site-specific risk management and strategic decision making
Need for MBT product standards and specifications	Licensing and permitting regime of MBT plants, by EA Data availability and format for life-cycle analysis (LCA) modelling, EA LCA strategic decision making tools and cost-benefit analysis (CBA)
Financing modes of capital intensive infrastructure, while not yet considered as fully proven	Environmental and overall performance evaluation of MBT plants
Overall MBT plant economics still vague - revenue from outputs?	

## BENEFICIARIES

- ⊗ **Operators / developers**: acquisition of quantitative process data, generated in the UK by an independent body, for use in investment decision-making
- ⊗ **Local authorities and regulators**: improved understanding of the interface issues between waste processing, material market development and environmental protection and regulation; confidence in technology performance
- ⊗ **Publics, NGOs and consultees**: greater clarity over perceived and actual risks / benefits of MBT processes and SRF uses. More realistic assessment of key opportunities for public acceptance
- ⊗ **All stakeholders**: a demonstration of MBT benefits and residuals processing as a viable and cost-effective long term waste management option

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## FUNDING

•90% landfill tax funded, sponsored by GrantScope (former ShanksFirst)  
•remaining 10% - consortium of project partners : Summerleaze, Entsorga, Cambridgeshire County Council, Biffa Waste Services, Dorset County Council and Luton Borough Council