

RPS



## Mechanical Biological Treatment (MBT) Seminar

Ashbourne House Hotel, Ashbourne, 26<sup>th</sup> January 2006



## Role of MBT within Waste Management Planning in Ireland

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# What is MBT?

- Generic term embracing the use of several mechanical and biological process elements that are combined in a wide variety of ways
- Outputs include compost-like residues, waste derived solid fuels and in some cases biogas
- Can result in significant diversion of Biodegradable Municipal Waste from landfill
- Can reduce environmental impact of landfill through stabilisation of waste

# What are drivers for MBT?



# Drivers for MBT – Legislation

- EU Waste Hierarchy



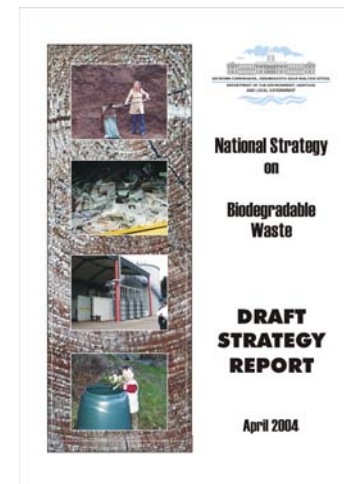
- EU Landfill Directive, 1999

Year	Limit imposed by EU Landfill Directive on the Landfilling of BMW
2006	75% of BMW landfilled in 1995
2009	50% of BMW landfilled in 1995
2016	35% of BMW landfilled in 1995

# Drivers for MBT – Legislation

- National Policy
  - Draft National Biodegradable Waste Strategy (2004)

<b>EU Landfill Directive 1999</b>
By 2009 only 50% of the total BMW generated in the Region in 1995 can be landfilled.
<b>Draft National Biodegradable Waste Strategy 2004</b>
By 2009 only 24% of the total annual BMW produced in the Region can be landfilled.



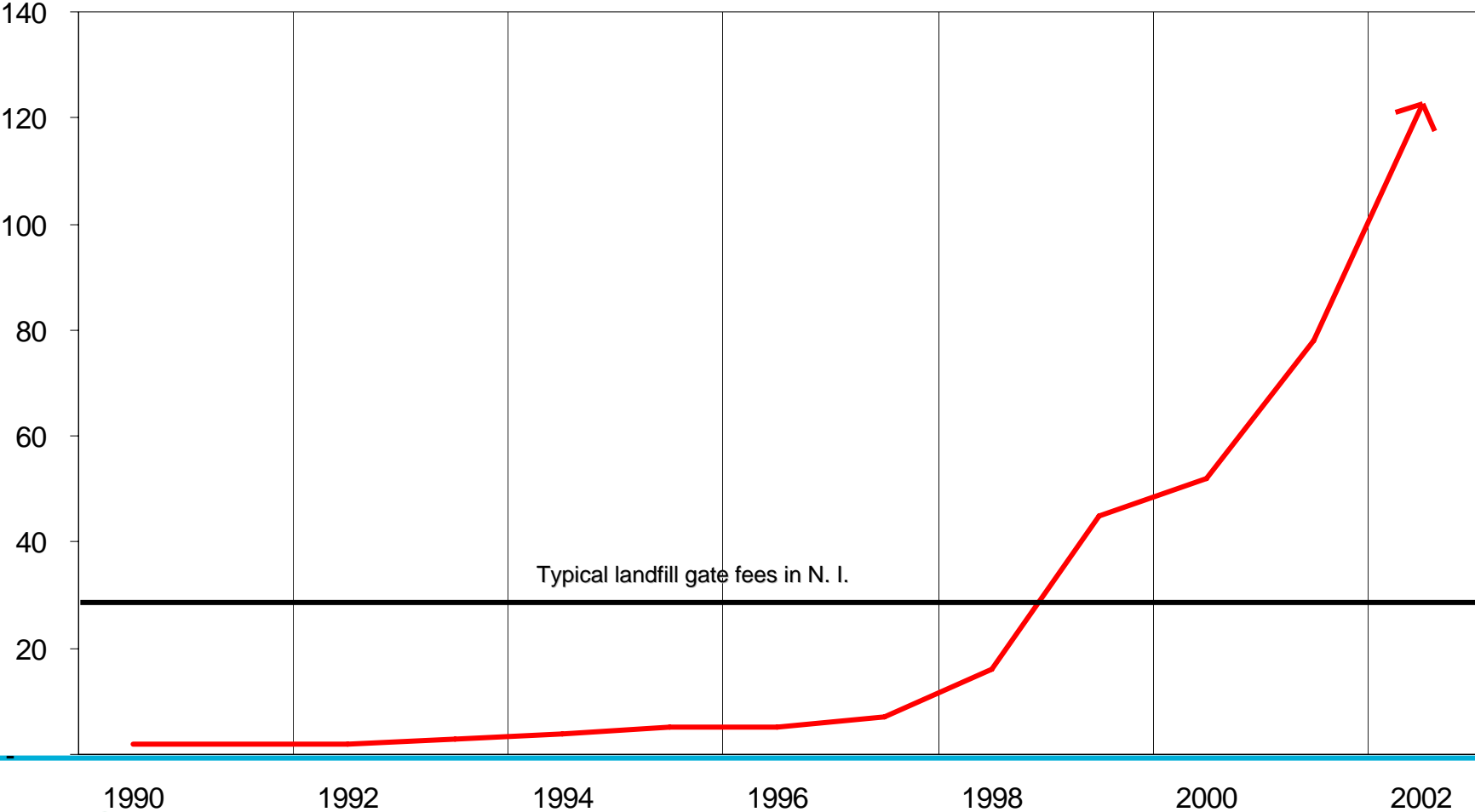
- Regional Waste Plans (2005-2006)

# Drivers for MBT - Environment

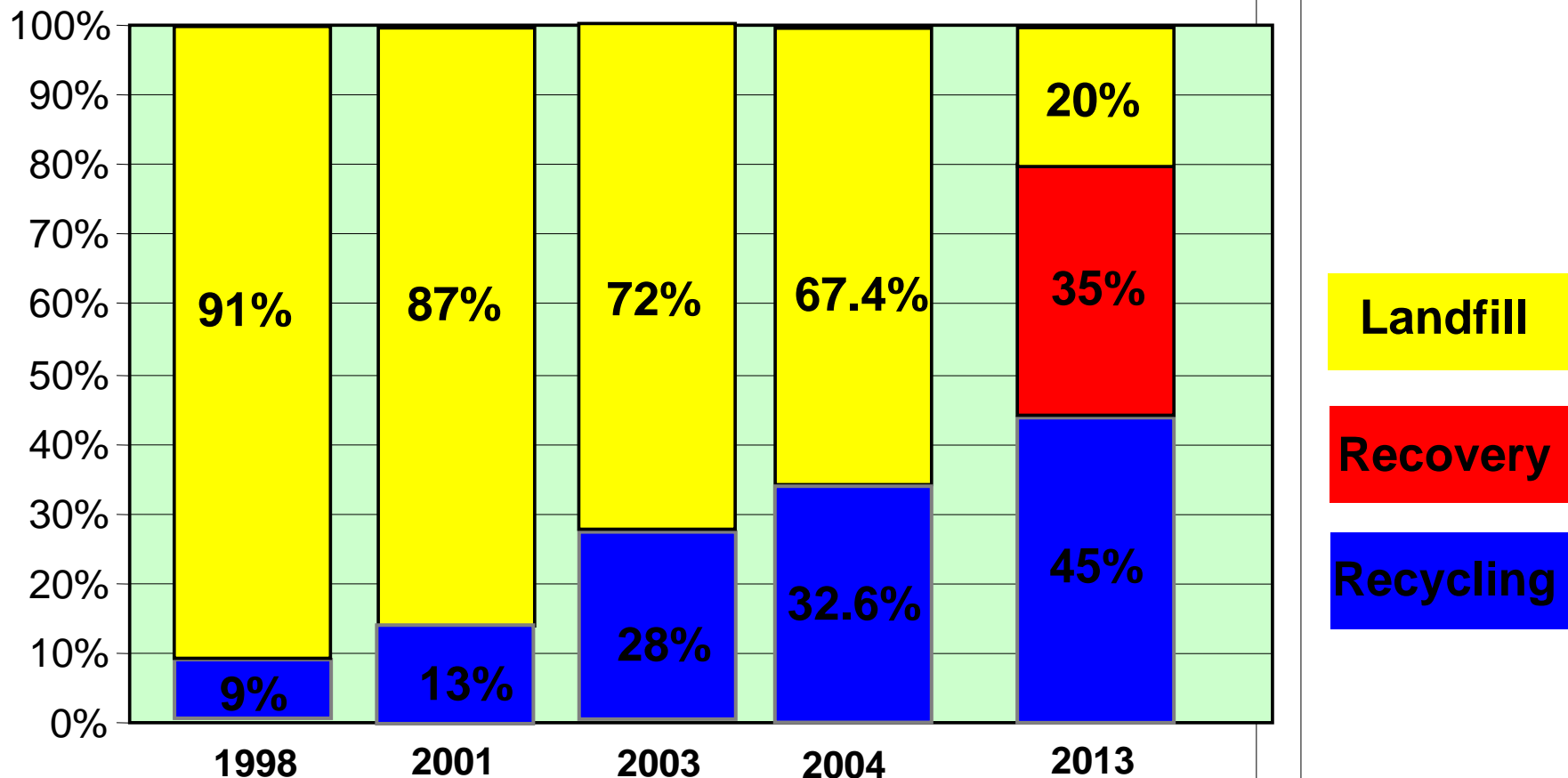
- Reduction of biodegradability and stabilisation of waste to landfill thus reducing environmental impact
- Outputs can be used for brownfield land restoration and reclamation
- Secondary fuels can be used for energy recovery
- Increased recycling and recovery of value from mixed waste
- Can assist in meeting landfill diversion targets
- Some MBT plants claim diversion from landfill through moisture loss on drying!!

# Drivers for MBT – Cost

Average Landfill Prices since 1990



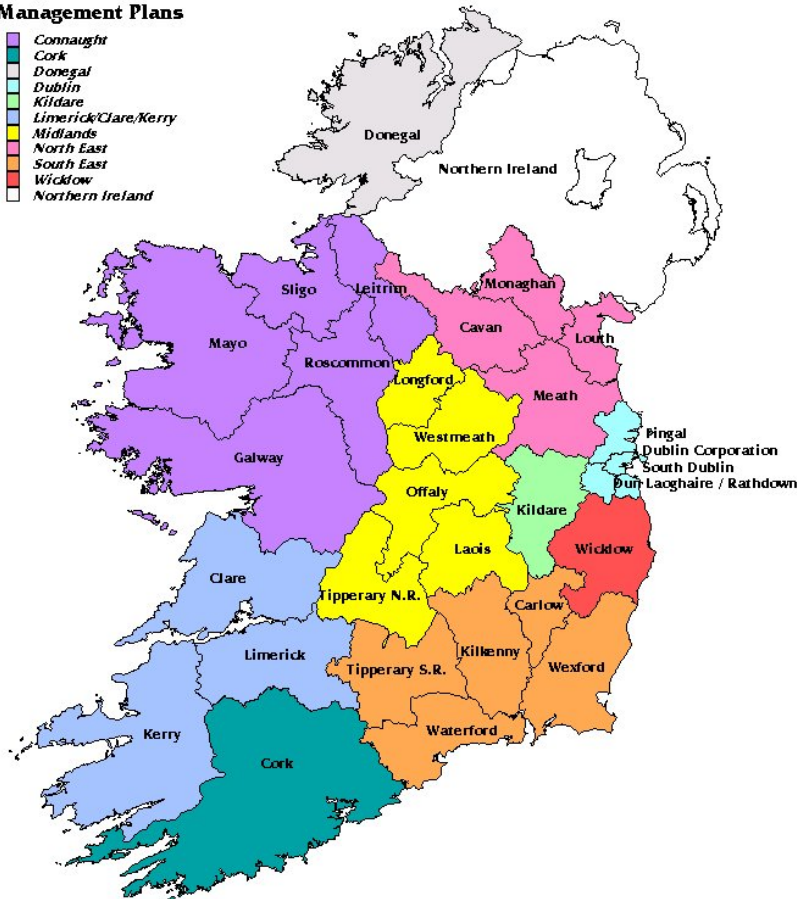
# National Progress on Municipal Waste Recycling



# Regional Approach to Waste Management in Ireland

## Regional Waste Management Plans

- Connaught
- Cork
- Donegal
- Dublin
- Kildare
- Limerick/Clare/Kerry
- Midlands
- North East
- South East
- Wicklow
- Northern Ireland



WASTE MANAGEMENT PLAN  
*Working for the Dublin Region*



# Regional Plans - Policy for Household Recycling

## Overview of Household Waste Collection



# Integrated approach to waste management

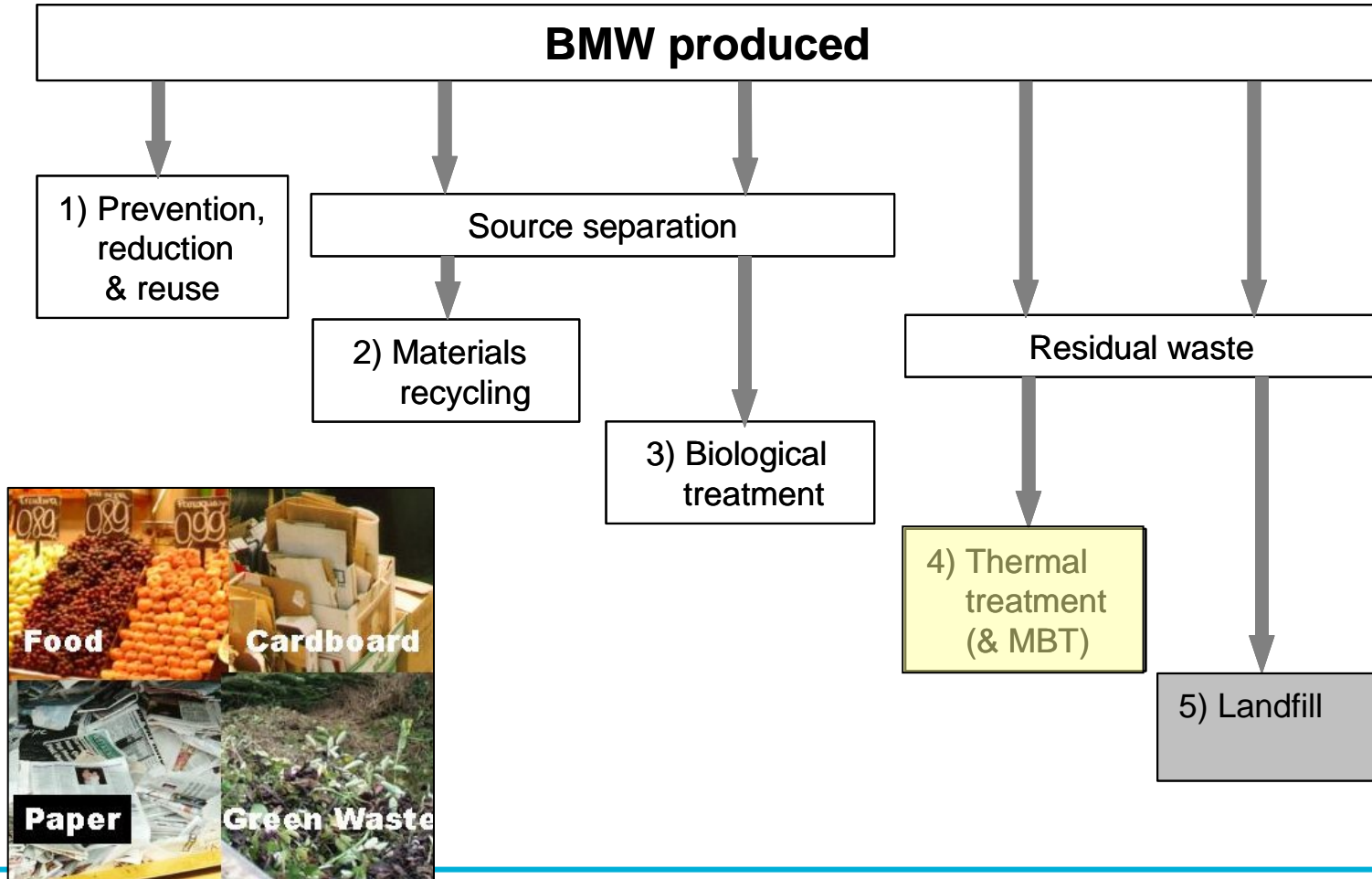


# Regional Recycling/Recovery/Landfill Targets

Region	Recycling %	Recovery %	Landfill %	Total
Dublin	59	25	16	100%
North East	43	39	18	100%
Midlands	46	37	17	100%
Connaught	48	33	19	100%
Limerick/Clare/Kerry	41	45	14	100%

2 Bin vs 3 Bin?

# Draft National Strategy



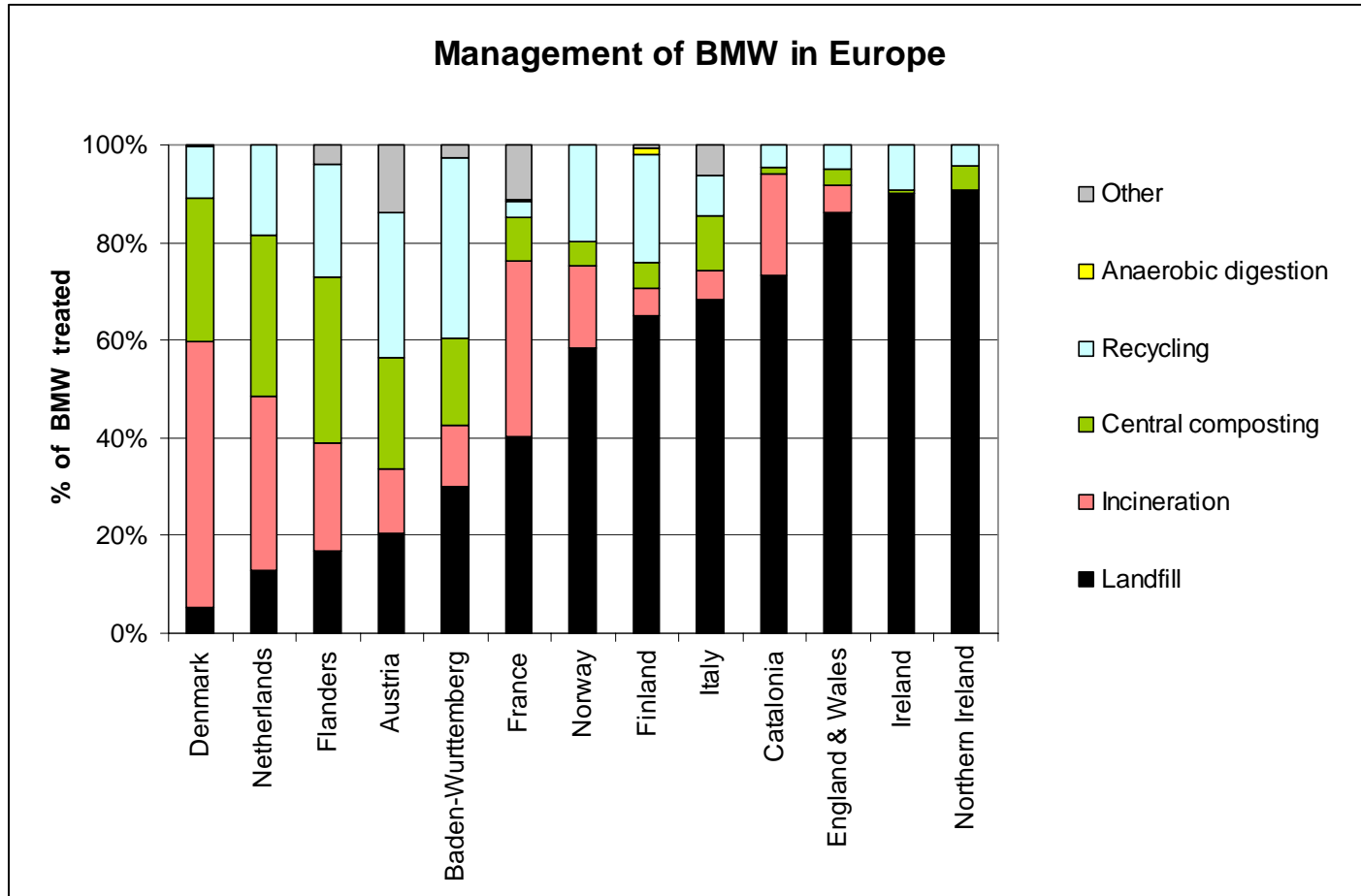
# Centralised composting



# European Policy

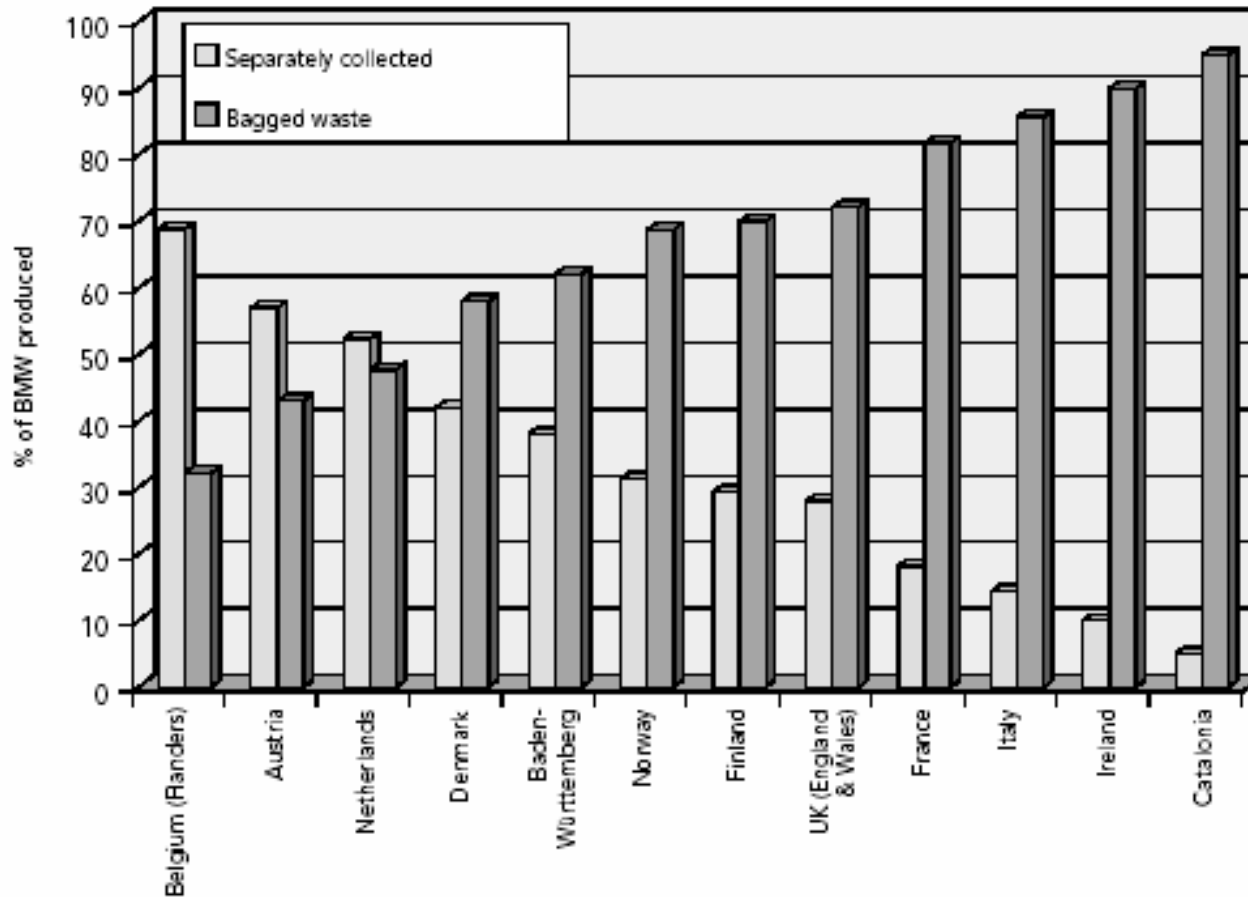
- Belgium – target for separate collection of 71% of biodegradable waste by 2007
- Netherlands – targets of 55% and 60% for separate collection of food waste from households and commerce respectively
- Denmark – high diversion of biodegradable waste from landfill through source separation
- Germany – commitment to source separation – MBT as pre-treatment prior to landfill in rural areas where incineration not available/option
- Countries with high proportion of separate collection of BMW including organic waste have high levels of landfill diversion
- Countries with low diversion rates are generally those where pressure to develop MBT is greatest???

# Management of BMW in Europe



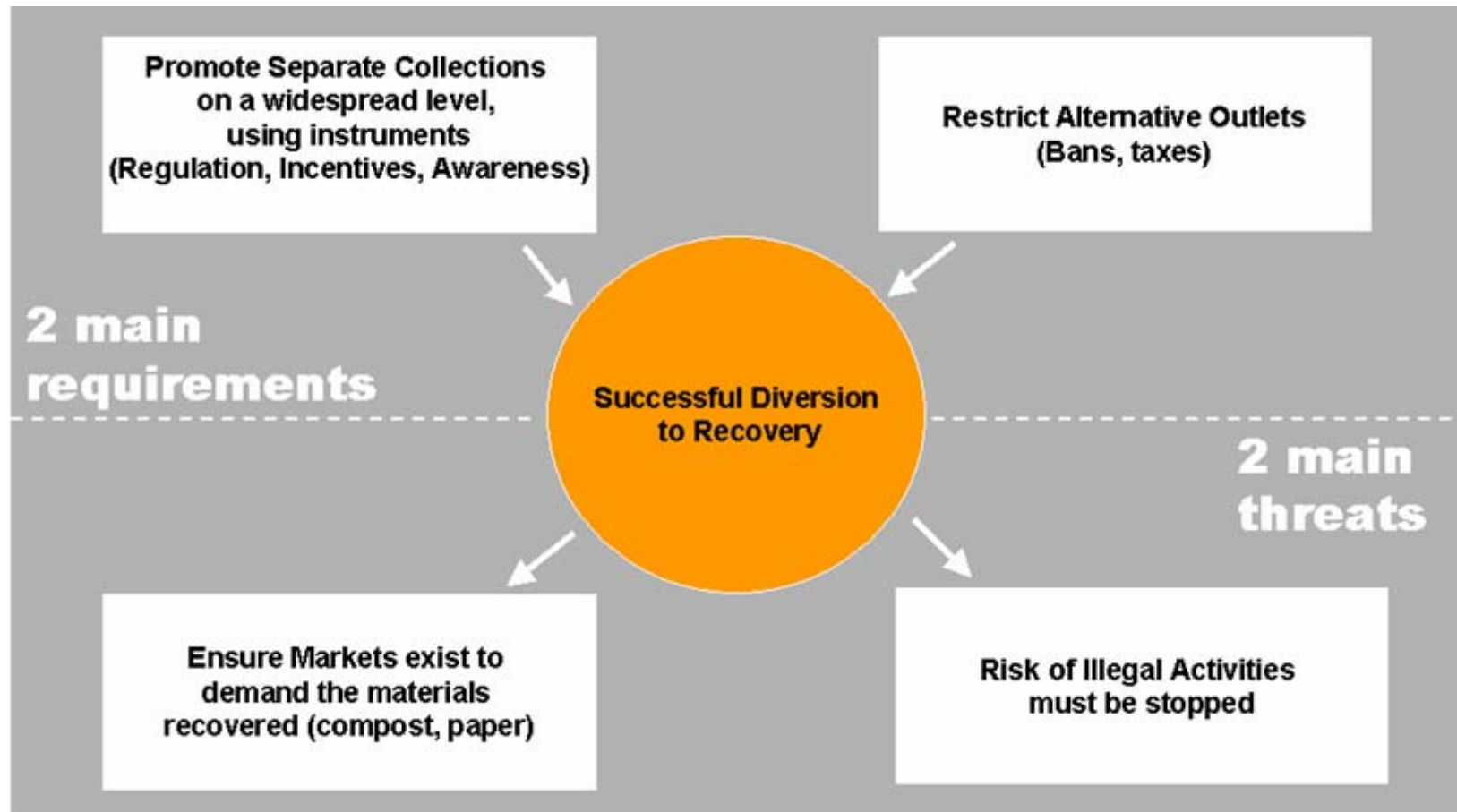
Source European Environment Agency, 2002

# Separate collection of BMW in Europe



Source European Environment Agency, 2002

# European Experience



“Biodegradable Municipal Waste Management in Europe” - European Environment Agency (2002)

# EA Guidelines on End-Use of MBT outputs (June 2005)

- ***“Waste remains waste until fully recovered”***
- *“Non-source segregated stabilised organic fraction from an MBT plant will only have a few end uses that will depend on the quality of this fraction. The solid fraction of an MBT plant requires further recovery and is considered to be WASTE for regulatory purposes”.*
- Stabilised waste from MBT used as Landfill cover will not be considered recovery
- Stabilised waste from MBT and used in land restoration must be deemed to be fully recovered to count towards diversion targets.

# EA Guidance

Type of Output	Type of Use	Can it be exempt (specified recovery operations)	Licence /PPC permit conditions required	Counts Against Landfill allowances
Biotreated fines	Landfill	No	Yes	Yes, if derived from MSW
Biotreated fines	Landfill daily or immediate cover	No	Yes	Yes, if derived from MSW
Biotreated fines	Landfill restoration/land reclamation	Yes, but only if requirements for para 9 are met plus agricultural benefit, ecological improvement and no harm to health or pollution of the environment.	Yes, if not registered exempt	No if meet requirements of an exemption
Digestates	Landfill restoration/land reclamation	Yes, but only if requirements for para 7 or 9 are met plus agricultural benefit, ecological improvement and no harm to health or pollution of the environment.	Yes, if not registered exempt	No if meet requirements of an exemption
High calorific value (refuse derived fuel –RDF)	As a fuel or carbon source in any combustion process	No	Yes, PPC permit for plant w hich must comply w ith waste Incineration Directive	No

# Drivers for 2 bin systems– Cost



Is cost a good enough reason?

MBT vs WTE?

# 'Juniper' Report (2005)

- Most important driver for considering MBT is political desire by LA members to avoid the use of incineration
- The possibility that some forms of MBT, in conjunction with kerbside recycling, could deliver 2020 targets for many Local Authorities opens up a route that, politically, many will wish to explore further
- However some LAs may need to combine MBT with thermal – others may find they cannot identify robust outlets for the output
- Notwithstanding the reluctance of many councillors to consider incineration, this may be best solution on a balance of cost, environmental performance and risk
- Once guidance finalised on calculating rates of diversion of BMW from landfill, methodology could result in lower rates of diversion than previously calculated

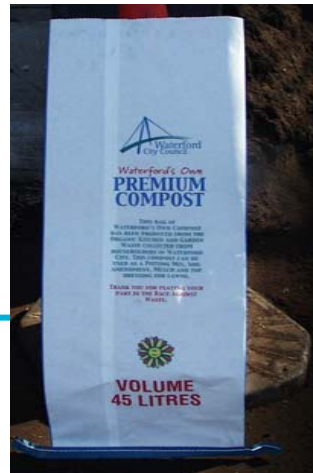
# Who are stakeholders in deciding right approach?

- DoEHLG
- Local Authorities
- Private Waste Industry
- Environmental groups/NGO's
- Public



# Public view

- Strong support from public during consultation period on Draft Waste Plans for separate collection of organic waste
- Strong support for schemes in operation in Galway & Waterford
- Pilot scheme (18,000 households) in Fingal – very positive feedback
- Build public confidence in product



# Regional Policy - Dublin

- MBT assessed as part of Review of Dublin Waste Plan
- Local authorities pursuing a policy to source separate organic waste to make clean compost. Offers best chance for development of sustainable market for good quality compost
- Production of large volumes of low grade compost from MBT could be detrimental to establishment of markets for cleaner compost
- RDF production highly dependent on markets and quality of product – need facilities that can meet EU Waste Incineration Directive
- Energy yield better from WTE than MBT – reduction in greenhouse gases. WTE higher on Waste Management Hierarchy

**Recycling and composting of source separated waste followed by thermal treatment of residual waste is continued policy**

# Regional Policy - Midlands

- Policy of separately collected dry recyclables and organic waste (3-bin) to >50% of householders by end 2009
- 3<sup>rd</sup> bin to be introduced through waste collection permitting system
- Separate collection of commercial organic waste to be regulated
- In order to meet mandatory requirements of EU Landfill Directive, pre-treatment of waste from areas not covered by 3<sup>rd</sup> bin will be required in the short-term
- Long-term viability of MBT challenged by sustainability of outlets for products and by WTE
- Long-term WTE is favoured for residual waste after maximum recycling

**MBT an option in short term for waste from areas not covered by 3<sup>rd</sup> bin pending development of WTE**

# Regional Policy – Limerick/Clare/Kerry

- Reduce the quantity of biodegradable waste landfilled in accordance with the EU landfill Directive
- Extend three-bin system for settlements greater than 1000 population
- Investigate the use of end products from biological treatment (compost) by Local Authorities in horticultural use and in restoration of landfills
- An integrated approach to waste management will require treatment technologies such as Mechanical Biological Treatment (MBT) in order to reach the 2006 and 2009 landfill diversion target
- Two additional biological treatment facilities shall be provided for the Region by end of 2007

**MBT an option in short term for waste from areas not covered by 3<sup>rd</sup> bin pending development of WTE**

# Regional Policy – South East Region

- Life Cycle Analysis used to compare scenarios with MBT and WTE
- Preferred scenario was that utilising thermal treatment with residues to landfill based on environmental comparison
- Post 2007 urban areas with population > 1000 to have 3 bin system for household, industrial and commercial bio-waste
- Centralised biowaste treatment facilities for source segregated waste

# Control of MBT process

- Strict Processing Requirements are needed for MBT Waste Inputs
- Need an appropriate methodology for measuring biodegradability of MBT outputs and hence to calculate diversion targets in Ireland

	<b>Germany</b>	<b>Austria</b>
Respiration Activity AT4	<5mg/g DM	<5mg/g DM
Gas formation rate within 21 days	<20l/kg DM	<20l/kg DM
Total organic carbon in Eluate	<250 mg/l	

# Conclusion

- MBT can play a role in reducing biodegradability of input waste if it is to be subsequently landfilled
- MBT may have a place in several regions in the short term in assisting meeting the landfill diversion targets for BMW as long as it does not compromise roll-out of separate collection
- Markets may not be sustainable – lot of uncertainty
- MBT is not an alternative to Waste to Energy (where RDF produced, the plant will form one step in a longer process to recover energy from waste)

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