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## 7. POLICY DEVELOPMENT

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An objective of the Waste Management Plan for County Kildare is to ensure that both European and National waste management policies and targets can be met. To identify the most appropriate waste management techniques to enable County Kildare to meet these requirements, an assessment of three generic waste management approaches was carried out. The detailed technical assessment is included in Appendices 2 and 3.

The appropriate technologies from this assessment inform the policy set out in this Plan. The three generic waste management approaches are examined under three headings, as follows:

- impacts on the environment
- ability to meet National and EU waste targets
- availability of adequate finance

### 7.1. Generic Waste Management Approaches

The three generic waste management approaches chosen for examination for County Kildare are examined under three scenarios, as follows.

- Scenario One: achieve the maximum recycling and recovery rates through the use of two/three-bin systems, with the waste collected in the residual bin being disposed of to landfill
- Scenario Two (a): as Scenario One, with the waste in the residual bin being mechanically processed and stabilised, and being disposed of to landfill
- Scenario Two(b): as Scenario One, with the waste in the residual bin being mechanically processed with the residual being disposed being thermally treated
- Scenario Four: as Scenario One, but with the waste in the residual bin being disposed of to thermal treatment

This Plan assumes that the maximum effort is made with regard to waste prevention and minimisation, waste recycling and waste recovery. This will be achieved through a public awareness and information campaign. This will be focused on waste prevention and minimisation, dry recyclable collections and organic waste home treatment or collection. Waste for recovery/recycling will be collected via two/three-bin collection systems, bring centres, recycling/civic amenity sites and at special collections.

The detailed analysis contained in Appendices 2 and 3 was carried out under the headings of environment, finance and achievement of target requirements.

## **7.2. Components of the Waste Systems Examined**

The waste minimisation/prevention and waste recycling input is similar for all three scenarios set out above. The essential difference between the three scenarios is how the waste in the residual bin is treated and/or disposed of.

Kildare does not have the overall waste quantities to generate the economies of scale required to make thermal treatment an option at this point. Thus, Scenario Two (b) and Three are not considered suitable.

This assessment now examines in more detail whether Scenario One or Scenario Two is the more appropriate waste management technique for Kildare.

### **7.2.1. Scenario One**

Scenario One can be described loosely as the landfill option, and comprises the following:

- home composting
- three-bin collection system (dry recyclables, bio-waste, and residual waste)
- network of bring banks and recycling centres (civic amenity sites)
- transfer station/stations
- biological treatment facility/facilities
- dry material recovery facility/facilities
- residual landfill/landfills

This scenario assumes that all waste which is collected in the residual bin is sent for landfilling.

### **7.2.2. Scenario Two**

Scenario Two assumes that all waste collected in the residual bin is mechanically processed, with the biological fraction then undergoing stabilisation. These systems are commonly known as mechanical-biological treatment or MBT systems.

The infrastructure required for this system is similar to Scenario One and is outlined below; however, it requires a mechanical-biological treatment facility (comprising mechanical separation of recyclables, and bio-treatment/stabilisation of the biodegradable fraction):

- home composting
- three-bin collection system (dry recyclables, bio-waste, and residual waste)
- network of bring banks and recycling centres (civic amenity sites)
- transfer station/stations
- biological treatment facility/facilities
- dry material recovery facility/facilities
- mechanical biological treatment facility/facilities
- residual landfill/landfills

### **7.3. Results of Analysis**

The formulation of the waste management policy for Kildare is based on the following criteria:

- environmental assessment of waste management scenarios
- ability to meet European and national waste management targets
- financial cost

#### **7.3.1. Environmental Assessment**

An environmental assessment was carried out to assess the relative environmental impacts of each of the waste management scenarios. This assessment broadly follows the methodology for a life cycle assessment as set out in ISO:14040. More detail on the inputs and outputs of the life cycle assessment are set out in Appendix 3 of this Plan.

According to the following general environmental parameters, Scenario Two (comprising MBT and landfill for residual waste) gives a better result than Scenario One (landfill alone for residual waste). These environmental categories include:

- potential impact on acidification
- potential impact for ozone creation
- potential impact for eutrophication
- potential for global warming
- potential for ecological toxicity
- potential for human toxicity

In general, Scenario Two is preferred to Scenario One in environmental terms, due to improved environmental performance over most (although not all) parameters.

#### **7.3.2. Ability to meet European and National Waste Management Targets**

Recycling includes materials obtained through the dry recyclable collection and the recyclable fraction obtained through mechanical treatment processes.

Materials recovery includes all the material recovered from the material recovery facility, composting of biodegradable material and stabilised material going to co-combustion or waste-to-energy facilities after pre-treatment in the mechanical-biological facility.

Article 6 of the amended Packaging Directive states that targets can be achieved by “recovery” and also by incineration at “waste incineration plants with energy recovery” and therefore energy recovery from thermal treatment can be used to achieve recovery-related targets.

Materials for disposal are those residues that are not recycled or recovered through mechanical-biological treatment facilities. These may include low quality stabilised compost from mechanical-biological treatment systems as although there are short-term markets for the output (i.e. land remediation) there are no long-term sustainable markets identified in Ireland at present. The residual material that cannot be recycled or recovered is landfilled.

Table 7.1 outlines the percentage of recycling and recovery and landfill for Scenarios One and Two.

**Table 7.1: Recycling and Recovery Rates for Scenarios One and Two**

Waste Destination	Scenario One Landfill	Scenario Two MBT & Landfill
recovery	49 %	65 %
recycling	49 %	54 %
landfill	48 %	32 %
disposal outside of County (hazardous fly ash)	0 %	0 %
disposal outside of County (dross from recycling)	2 %	2 %

Notes: Scenario Two values shown above are based on the assumption that there is a three-bin collection system, and a biological treatment plant to treat separately collected biowaste  
 some waste will be disposed of outside the County; hazardous fly ash generated from thermal treatment has to be disposed of to a hazardous waste landfill; and if any recycling takes place outside the county or country, the dross arising from that fraction will be managed locally

Table 7.2, below, sets out the primary targets for the diversion of biodegradable waste from landfill in the Landfill Directive and other national targets and degree of achievement. These diversion targets are based on waste arising for the baseline year of 1995.

**Table 7.2: Achieving Targets for Diversion of Biodegradable Waste from Landfill**

Bio-degradable Waste	Scenario One	Scenario Two
divert 25 % of biodegradable waste from landfill (2006)	x	✓✓
divert 50 % of biodegradable waste from landfill (2009)	x	✓✓
divert 65 % of biodegradable waste from landfill (2016)	x	✓✓
diversion of 50 % of overall household waste from landfill (2013)	x	✓
35 % recycling of municipal waste (2013)	✓	✓✓

x fails to meet targets  
 ✓ meets targets  
 ✓✓ exceeds targets

It is clear from Table 7.2 that Scenario One (the landfill-only option for residual waste) will not comply with the Landfill Directive. Further treatment of the materials collected in the residual bin is required.

Thus, in terms of achieving waste targets, Scenario Two (the mechanical-biological treatment option with landfill) is preferred over Scenario One (the landfill-only option).

### 7.3.3. Financial Assessment

A financial assessment has been carried out, and is detailed in the Appendix 3.

The financial model calculates the operational and investment costs for each year of the 20-year period. These costs are set out for the two target years of 2009 and 2016. These target years have been chosen as they correspond to two of the three target years for the diversion of biodegradable waste to landfill. It has also been assumed that by the year 2009 all of the components of the waste management scenarios would be in place. The costing from the financial model for the residual waste stream is set out in Table 7.2.

**Table 7.3: Financial Implications for Scenarios One and Two**

<b>Cost of Facilities</b>	<b>Scenario One</b>	<b>Scenario Two</b>
€ million 2009	7.6	6.3
€ million 2016	8.1	6.8

The financial calculations show that Scenario Two (MBT with landfill for residual waste) is to be preferred over Scenario One (landfill-only for residual waste).

## **7.4. Summary**

County Kildare does not have the overall waste quantities to generate the economies of scale required to make thermal treatment an option at this point.

Of the other two scenarios presented, mechanical-biological treatment of the residual waste stream prior to disposal is clearly preferred for the following reasons:

- improved environmental performance over a range of parameters (although not all)
- exceeds policy and target requirements
- improved financial performance