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## CHAPTER 1 – INTRODUCTION

Each Local Authority is expected to produce detailed plans for managing municipal waste inline with the Welsh Assembly Government Guidance. In preparing this Strategy for the management of municipal waste in Gwynedd we have focused on adopting the Waste Hierarchy (see Figure 1.1).

**Figure 1.1 The Waste Hierarchy**



Waste reduction is at the top of the hierarchy. To date the principal focus has been on the recycling of waste, however it is simply not enough to find different ways of dealing with the waste we produce. As a priority we must aim to produce less in the first place.

Second in the hierarchy is reuse of waste which essentially requires using a product over and over again. If the product regarded as waste is no longer suitable for reuse, it may still contain materials of value that can be recovered through recycling, composting or treatment with energy recovery.

Only when all of the other levels of the waste hierarchy have been maximised, should disposal of material be considered. Various European Union Directives limit the amount and type of remaining material that is permitted for landfill. However, regardless of the method of waste management applied, there will always be a need for landfill for those elements of the waste stream that cannot be further re-used, recycled, composted or otherwise treated.

The Best Practicable Environmental Option is widely accepted as the key concept for assessing waste management options and facilities. This Strategy is based on a modified version of the BPEO which incorporates social and economic factors.

**The BPEO is:**

***The option that provides the best overall solution taking into account specific local circumstances, social and economic aspects, as well as impacts on the environment.***

The Strategy also takes into account the following:

**Proximity Principle** – dealing with waste as close to the source of production as possible.

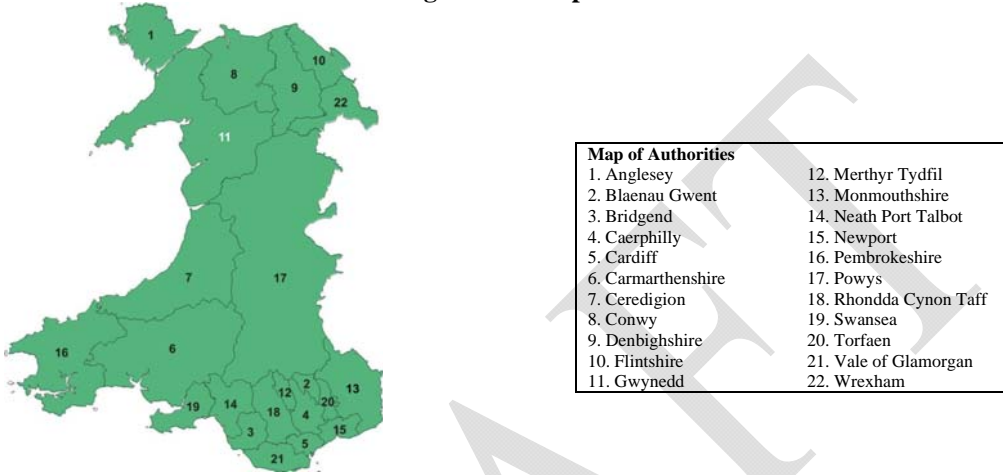
**Regional Self-Sufficiency Principle** – waste should be where possible and practicable dealt with inside Gwynedd’s boundaries so as to avoid transportation.

## CHAPTER 2 – GWYNEDD IN CONTEXT

### 2.1 GEOGRAPHICAL MAKEUP

Gwynedd is situated in North Wales, covering an area of 2,548 square kilometres. Figure 2.1 shows the location of Gwynedd and neighbouring Authorities.

**Figure 2.1: Map of Wales**



Almost 70% (1,742 km<sup>2</sup>) of Gwynedd is located within the Snowdonia National Park.

Gwynedd is characterized by a few populated urban centres located long the coast, with a number of smaller market towns and villages in rural areas. The largest towns are Bangor and Caernarfon, with populations of approximately 11,000 and 10,000, respectively.

The main strategic road network is based around the A55, in the north of the authority. The rail network is dominated by the North Wales Coast railway line, whilst the Cambrian Coaster line links the southern Dwyfor and Merionnydd Coast with Machynlleth and Shrewsbury. The Conwy Valley line is also important for providing access to Blaenau Ffestiniog.

By sea, the port of Holyhead (in Ynys Mon) is under an hour away where Irish Ferries and Stena Line operate both regular and high speed services to Dublin and Dun Laoghaire in Ireland.

A map of Gwynedd showing principal population centres, transport infrastructure and rivers is given in Figure 2.2.

### 2.2 POPULATION & HOUSING

Gwynedd has a resident population of 116,600 (estimated in 2000), representing approximately 4.0% of the total population of Wales, and a housing stock of 56,517 (1999). As a primarily rural Authority, the population density is low at 47 persons per sq. kilometre compared with 140 persons per sq. kilometre for Wales as a whole.

### **2.3 EMPLOYMENT**

Traditionally, economic activity in the Authority has been centred on agriculture. There are currently 4,370 VAT registered companies located in Gwynedd, the largest sector being Agriculture at 33% of the total, whilst manufacturing represents only 5% of the total number of companies. Almost 90% of companies employ less than 10 people. In terms of number of employees, the public sector is an important source of employment in Gwynedd. There is an opportunity for close collaboration between employers in the public sector to raise awareness of waste issues and promote good practice.

Tourism makes a vital contribution to the Gwynedd economy. In 2000, Gwynedd attracted just over 2 million staying visitors and an additional 3.8 million day visitors.

A detailed statistical profile for Gwynedd is presented in Appendix 1 of the Technical Appendices.

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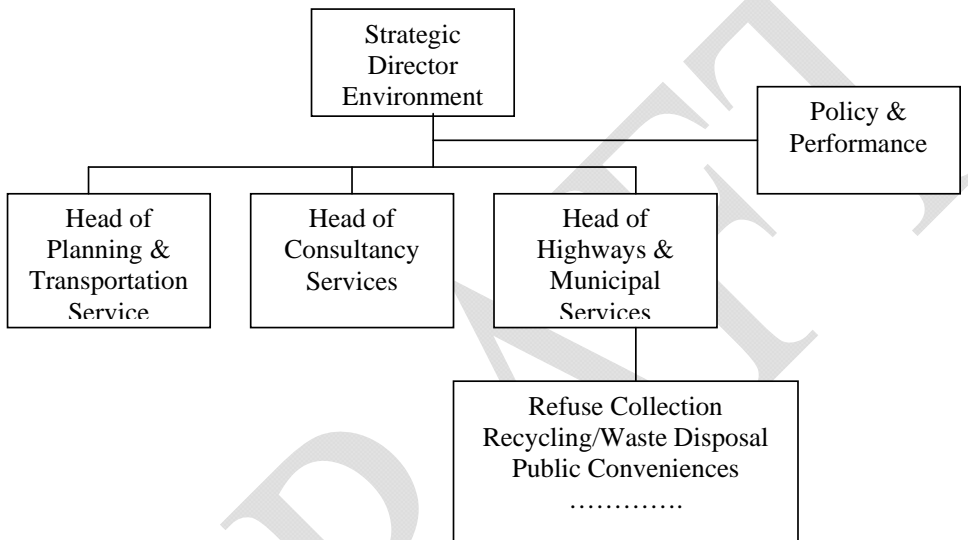
## CHAPTER 3 – WASTE MANAGEMENT TODAY

### 3.1 DESCRIPTION OF EXISTING SERVICE DELIVERY

#### 3.1.1 Overview

The Council operates a refuse collection service for each household in the Authority. The service is provided by a Highways and Municipal Services section within the Environment Directorate. An outline structure of the Environment Directorate is shown below.

Figure 3.1 Environment Directorate Structure



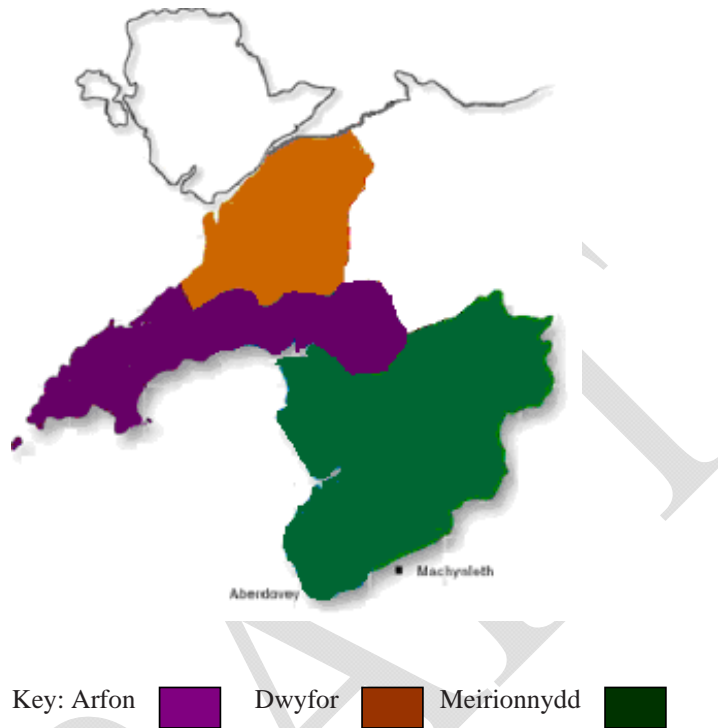
The waste collection service is split into collection rounds based on three areas (Meirionnydd, Dwyfor and Arfon), as shown in Figure 3.2 below.

Each area has its own fleet of collection vehicles of various sizes to allow access to narrow streets and lanes. Each vehicle follows a pre-determined round each week and collects wastes from households, and also commercial properties that have a trade waste collection contract with Gwynedd Council.

Either wheeled bins (42% of properties) or black sacks (58% of properties) are used for the containment of household waste. Around 90% of households have a true kerbside collection service (where the waste is picked up from the kerbside outside the property). Less than 1% of properties have an assisted collection service<sup>1</sup> (for the elderly or infirm), with 3% having back door collection and 7% rear access collection. Approximately 170 collection bunkers exist in the Meirionnydd area for servicing remote properties.

<sup>1</sup> All Wales Waste Management Benchmarking Group Agreed Indicators (2002/03 actuals)

**Figure 3.2 Gwynedd Council collection round areas**



There are two waste disposal contracts in place covering the Arfon and Dwyfor areas, with the waste disposal Contracts being with the Local Authority Waste Disposal Company (LAWDC), Cwmni Gwastraff Môn-Arfon. The Contract for the Arfon area is due to end in March 2005. The Contract for Dwyfor area is due to expire in October 2004, with a provision to extend. Day to day running of a waste disposal site in the Meirionnydd area rests directly with the Council. A Directive issued by the Assembly Government enables the Council to directly run the landfill site at Harlech.

The Gwynedd area currently has two operational landfill sites for active wastes (non-inert, non-hazardous biodegradable wastes):

- Cilgwyn Landfill Disposal Site operated by Cwmni Gwastraff Mon Arfon (sufficient void capacity for 22-24 years. However, at present, there is uncertainty about the likelihood of the site being permitted under IPPC<sup>2</sup>)
- Ffridd Rasus Landfill, Harlech operated by the Council (sufficient void capacity for 40 years at current input levels)

<sup>2</sup> Integrated Pollution Prevention and control (IPPC) implements the EU's Integrated Pollution Prevention and Control (IPPC) Directive in the UK. The PPC regime requires that any person operating an installation or mobile plant (as defined in the Regulations) must obtain a permit from the environmental regulator and comply with the conditions in that permit.

The Council's site at Harlech has a pulverisation plant for the pre-treatment of waste prior to landfilling, which is a planning requirement. A second pulverisor plant at Llwyn Isaf, Clynog Fawr is currently 'mothballed'.

There are currently three civic amenity sites at Rhwngddwryd near Garn Dolbenmaen, and at the waste disposal sites at Cilgwyn and Harlech.

An arrangement is in place with Isle of Anglesey Council for use of the CA site at Penhesgyn. Discussions are currently taking place with Powys Council for shared use of the CA sites at Machynlleth.

### **3.1.2 Bring banks**

There are currently 61 bring bank sites in Gwynedd, 21 serviced by a local community organisation, Antur Waunfawr, and a further 40 serviced directly by waste reprocessors

### **3.1.3 Kerbside Recycling**

The Council introduced a kerbside collection scheme in 2002, based on use of a 55 litre box and fortnightly collections for paper, cans, glass and textiles. Materials are sorted at the kerbside into separate stillages on dedicated kerbside collection vehicles. The service is currently available to 74% of households in Gwynedd, with plans to service virtually all urban properties. Materials are taken to transfer stations at Pwllheli, Bangor and Caernarfon for bulking and onward transportation to reprocessors. The kerbside collection service is provided by the Highways and Municipal Services section.

### **3.1.4 Commercial Waste**

The trade waste collection service currently services around 2088 properties collecting an estimated 8200 tonnes of waste per year. The collection service is provided as part of the household collection rounds, therefore the quantity of trade waste can only be estimated at this time. The commercial properties serviced are split over the 3 districts as follows: Arfon – 755 contracts; Dwyfor – 588 contracts; Meirionnydd – 745 contracts. Commercial customers are charged at a rate which reflects the average number of bags/bins put out for collection each week.

### **3.1.5 Bulky Waste**

In addition to the collection of household and trade waste, Gwynedd also provides a collection service for bulky wastes with 2 free collections of up to 4 items per visit, available per household per year. This service includes items such as large furniture, bathroom suites, etc.

The Council also collects refrigerators and freezers and has a contractual arrangement with a licensed contractor for degassing and de-manufacturing, thereby reducing the amount of Chlorofluorocarbons released to atmosphere. Degassed units are disposed of through a contractual arrangement with a licensed contractor.

### **3.1.6 Clinical Waste**

A clinical waste collection service is provided through a joint working arrangement between the Council and Cwmni Gwastraff Mon Arfon to around 400 households. This is transferred to Cilgwyn landfill site for prior to onward transportation to a site licensed for high temperature incineration.

### **3.1.7 Community Skip Service**

The Council provides a community skip service to areas without easy access to a CA site, for disposal of residual household waste. At present the service is only operational in Dwyfor following a major revamp. The service comprises 6 manned sites with 4-6 skips at each site for separate collection of materials. The service may be amended again in due course.

### **3.1.8 Hazardous Household Waste**

A small amount of hazardous household waste is received by the Council. Such wastes include asbestos, pesticides, paints and other chemical preparations. Disposal arrangements will need to be changed in the near future to take account of new legislation

### **3.1.9 Street Cleansing**

In accordance with The Environmental Protection Act (EPA) 1990 the Council, as principal litter authority, has a duty to make sure that land under its control is kept free from litter and refuse, as far as is practicably possible. The Council follows the Code of Practice on Litter and Refuse which accompanies the EPA.

This service is carried out by the Highways and Municipal Services section and is undertaken on a district basis.

A litter plan is included as Appendix 17.

The Council will be using the Flycapture system to monitor the number of incidents of fly tipping and the level of costs involved

### **3.1.10 Abandoned Vehicles**

The Council has a duty under Sections 3-5 of the Refuse Disposal (Amenity) Act 1978, to remove abandoned vehicles within their area from the public highway. A total of 814 vehicles were removed and managed by the Authority in 2002/3, slightly down from the previous years figures at 873. Abandoned vehicles have notices placed upon them and after a statutory period the vehicles are removed to a local scrap merchant.

### **3.1.11 Fly Tipping**

In accordance with the provisions of The Environmental Protection Act 1990 and Refuse Disposal (amenity) Act 1979 the Council exercises its powers to remove fly-tipped waste. There is a small amount of fly tipped material generated within Gwynedd, although the exact amounts are not recorded as they are cleared as part of the street cleansing and litter contract.



### **3.1.12 Beach Cleansing**

The Highways and Municipal Services section is contracted by the Council for beach cleaning. This is undertaken as part of the street cleansing arrangements, with Amenity beaches being cleaned in line with the Code of Practice on Litter and Refuse, but with an extended period to cover Easter and September to reflect the use tourists make of the beaches.

### **3.1.13 Parks and Gardens waste**

There are two main methods of managing cut grass within Gwynedd. One is to cut the grass and leave it in-situ. The other is to cut the grass and collect afterwards for disposal by either composting or landfill.

Most of the grass cuttings from the Dwyfor area are managed by the cut and collect method with different arrangements in the other two areas depending on the type of area being cut/ managed. All collected grass is composted in local windrow systems on farms. Between April and September around 60 tonnes per month of this verge waste and parks and gardens waste is dealt with by windrowing in this way.

### **3.1.14 Community Recycling - Antur Waunfawr**

The Council is happy to see the community sector play a role in recycling. At present, the main links are with Antur Waunfawr, a community based organisation that provides recycling services in Gwynedd, including:

- Furniture and white goods reuse
- Office waste paper recycling
- Community bank recycling

The Council has had an informal contract with the organisation since early 1996 comprising provision of a depot operated as an MRF, a lorry and an annual grant.

Work is currently being undertaken to determine the viability of relocating recycling operations to a larger facility to allow a greater role in recycling and bulking up of recyclates to gain additional value. A further study is being undertaken to investigate the potential for increasing recovery of bulky waste items. The study is being carried out with Antur Waunfawr; however the conclusions may be transferable to other organisations.

### **3.1.15 Composting**

At present 3 farm-based sites are taking green waste for composting. The largest site composts approximately 4,000 tonnes of material each year comprising green waste, road sweepings and fibreboard from bulky waste collections and CA sites.

The Council has introduced the kerbside collection of green waste to a trial area from mid-April 2004.

### 3.2 CURRENT PERFORMANCE

#### 3.2.1 Waste Arisings

Table 3.1 provides details of municipal waste arisings for the years 1998/99 to 2002/03. The figures indicate considerable growth in waste arisings over this period, although it is unclear whether this is true growth in arisings or a result of evolving and changing methodology for recording municipal waste tonnages. These figures indicate an average growth rate of 6% over the period 1998/99 to 2002/3. This high growth rate can be attributed in part to the change in definition of waste from 'household waste' to 'municipal waste'.

**Table 3.1 Municipal Waste Arisings (1998 – 2002)**

	2002/3	2001/2	2000/1	1999/00	1998/99
<b>Municipal Waste (tonnes)</b>	76,123	70,973	68,112	63,757	61,400
<b>Increase on previous year (tonnes)</b>	5,150	2,861	4,355	2,357	-
<b>Increase on previous year (% increase)</b>	7.3%	4.2%	6.8%	3.8%	-

Comment [SGL2]: PE to supply latest figures

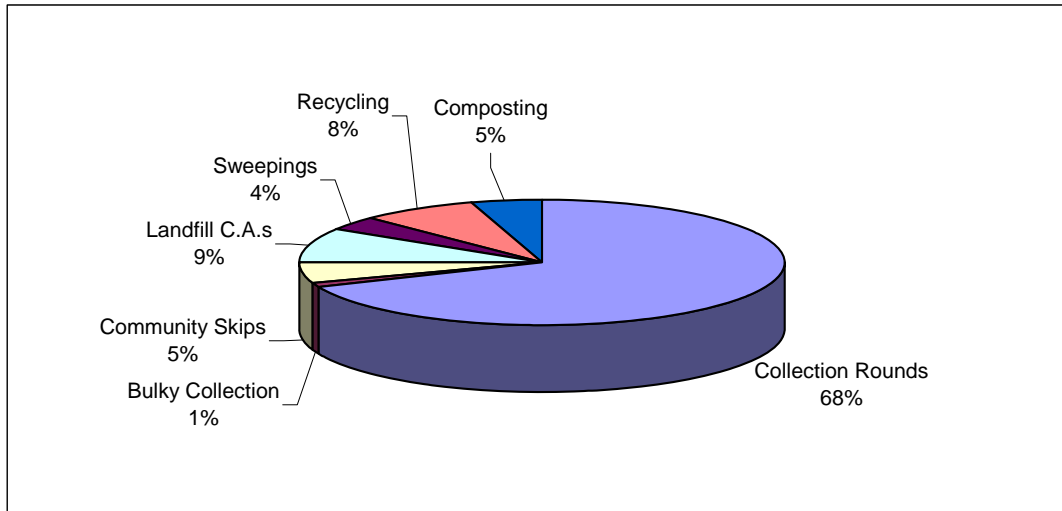
Municipal waste arisings for the years 2002/03 and 2003/04 are presented in Table 3.2. These figures show a negative growth rate of 1.4%, which is quite different to the increases shown in previous years. It is thought that the decrease has mainly occurred as a result of better control of community skips and civic amenity sites.

**Table 3.2 Municipal Waste Arisings (2002 – 2003)**

	2003/4	2002/3
<b>Municipal Waste (tonnes)</b>	75,070	76,123
<b>Decrease on previous year (% decrease)</b>	1.4%	-

The recycling and composting rates for 2002/03 are 7.76% and 4.65% respectively, whilst the comparative figures for 2003/04 are 11.27% and 5.87%.

A breakdown of Municipal Waste Arisings by collection method for 2002/3 is given in Figure 3.3. This shows that collected domestic refuse represents almost **70%** of total municipal waste arisings.

**Figure 3.3: Breakdown of Municipal Waste Arisings (2002/03)**

### 3.3 COMPARISON WITH OTHER WELSH AUTHORITIES

Using Performance Indicators (NAWPIs) collated by the Local Government Data Unit it is possible to compare Gwynedd's performance against all other Authorities in Wales. The following 7 NAWPIs relate to waste and recycling:

- NAWPI 5.1a - Percentage MSW recycled.
- NAWPI 5.1b - Percentage MSW composted.
- NAWPI 5.1c - Percentage MSW used to recover heat, power and other energy sources.
- NAWPI 5.1d - percentage MSW landfilled.
- NAWPI 5.5 - The percentage of highways and relevant land inspected of a high or acceptable standard of cleanliness.
- NAWPI 5.6 - Number of collections missed per 100,000 collections of household waste.
- NAWPI 5.7 - Percentage of population served by a kerbside collection of recyclables.

A more detailed description of each of the indicators is provided in the Technical Appendices (Appendix 1).

Performance data for 2002/03 is presented in Table 3 for all 22 Local Authorities in Wales. The 2002/03 data show that Gwynedd performed fairly well on a number of indicators, namely;

Percentage recycled (5.1a) - 15th out of 22  
 Percentage composted (5.1b) - 7th out of 22  
 Percentage landfilled (5.1c) - 15th out of 22  
 Highways cleanliness (5.5) - 16th out of 22  
 Missed Collections (5.6) - 13<sup>th</sup> out of 22

Table 3.2: Details of Performance Indicators for Welsh Local Authorities (02/03)

PI reference	5.1 (a) 1	5.1 (b)	5.1 (c)	5.1 (d)	5.5	5.6	5.7
2002/03 NAWPI outturn data	Total tonnage of municipal waste arising: percentage recycled or reused	Total tonnage of municipal waste arising: percentage composted.	Total tonnage of municipal waste arising: percentage used to recover heat, power and other energy sources.	Total tonnage of municipal waste arising: percentage landfilled.	The percentage of highways and relevant land inspected of a high or acceptable standard of cleanliness.	Number of collections missed per 100,000 collections of household waste.	Percentage of population served by a kerbside collection of recyclables.
Anlesey	6.15	4.65	0.00	87.90	M	31	0
Gwynedd	6.75	4.74	0.00	87.59	87.88	65	41
Conwy	9.11	7.32	0.00	83.17	74.01	110	0
Denbighshire	4.81	4.38	0.00	87.54	94.41	507	0
Flintshire	7.91	4.56	0.00	81.43	86.58	480	92
Wrexham	9.93	4.00	0.00	84.70	98.87	19	11
Powys	14.12	5.48	0.00	80.94	94.07	10	22
Ceredigion	17.18	3.17	0.00	79.65	97.73	392	0
Pembrokeshire	8.14	7.31	0.00	80.11	91.93	16	0
Carmarthenshire	10.58	2.97	0.00	85.42	98.69	399	5
Swansea	5.57	7.03	0.00	84.44	95.83	56	49
Neath Port Talbot	3.09	0.00	0.00	96.91	95.28	47	27
Bridgend	7.04	8.12	0.00	77.97	78.69	80	58
Vale of Glamorgan	8.74	3.62	0.00	84.07	93.80	436	98
Cardiff	5.82	3.55	0.00	74.66	93.58	21	72
Rhondda Cynon Taf	8.89	1.43	0.00	89.04	91.75	373	99
Merthyr Tydfil	9.50	0.00	0.00	90.50	97.64	9	47
Caerphilly	7.50	2.60	0.00	87.16	92.00	34	67
Blaenau Gwent	5.51	0.49	0.00	94.49	84.15	17	94
Torfaen	6.39	3.74	0.00	88.72	95.08	25	55
Monmouthshire	7.31	3.97	0.00	88.34	88.78	418	75
Newport	10.71	5.94	0.00	82.37	84.44	24	89
Wales	7.92	4.15	0.00	84.16	94.02	167	50
Lower quartile	6.21	3.02	0.00	81.67	87.88	22	7
Median	7.71	3.99	0.00	85.06	93.58	52	48
Upper quartile	9.40	5.30	0.00	88.23	95.28	387	74

Where doubt has been expressed about the reliability of councils' arrangements for producing the information, the figures are in bold. Missing information is denoted by M.

From the 2002/3 data Gwynedd had approximately 41% (up from 2.5% in 2001/2) coverage for kerbside recycling, however this situation has rapidly improved over the last year to the current levels of approximately 74% of all households.

### **3.4 PLANNING FRAMEWORK**

The planning framework at regional level is provided by the emerging Regional Waste Plan for North Wales which is being developed in line with the Assembly Government's Technical Advice Note Wales Waste (TAN 21). The Regional Waste Plan for North Wales has been submitted to WAG as a Final Draft, and is waiting ratification by the individual Unitary Authorities.

The local planning framework is provided by the Unitary Development Plan (UDP) for Gwynedd. The deposit draft of the UDP was published in 2002 for consultation. Formal adoption of the UDP is expected at the end of 2004.

### **3.5 CURRENT IMPROVEMENT PLANS**

It is noted that Gwynedd Council have developed a number of proposals to help deliver the recycling targets. These include:

- Expansion of the kerbside collection scheme
- Introduction of a commercial glass recycling service
- Cardboard Recycling
- Potential expansion of community recycling services

It is hoped to finance the majority of current recycling and composting improvements through funding from the WAG recycling fund, presently around £1.2 million per year.

## **CHAPTER 4 – DRIVERS FOR CHANGE**

### **4.1 LEGISLATIVE REQUIREMENTS**

#### **4.1.1 Environmental Act 1990**

EPA 1990 Part II sets out the duties of Waste Collection Authorities and Waste Disposal authorities. Under this Act, Waste Collection Authorities (WCAs) have a duty to collect waste from all households and commercial properties if requested to do so in receptacles specified by the WCA. The WCA may make a charge for the receptacles. Waste Disposal Authorities (WDAs) have a duty to dispose of waste collected by the Waste Collection Authorities and to provide facilities at which persons resident in its area may deposit waste. A WCA may charge for the collection of commercial and industrial waste and, under the Controlled Waste Regulations 1992, may charge for the collection of certain types of household waste. Unitary Authorities assume the responsibility of both the WCA and WDA.

Under this Act, Local Authorities have a statutory duty to keep roads, land, open highways, etc. free of litter and to ensure roads and highways are kept clean in accordance with the *Code of Practice on Litter and Refuse*. Waste Collection Authorities are also required to draw up plans for recycling household and commercial waste.

#### **4.1.2 Controlled Waste Regulations 1992**

These Regulations provide legal definitions of controlled wastes (household, commercial and industrial wastes). The Regulations also state that certain types of litter and refuse are to be treated as Controlled Waste. Under these Regulations, Local Authorities may charge for the collection of certain types of household waste. Examples of when a charge may be made include: garden waste, bulky waste, clinical waste and asbestos.

#### **4.1.3 Environmental Protection Act 1995**

Apart from the requirement to produce a National Waste Strategy, this Act was largely concerned with changes to the legal and institutional arrangements for waste management.

#### **4.1.4 Landfill Directive (99/31/EC)**

The Landfill Directive is seen as providing the principal legal framework influencing MSW management and strategy development in the UK. The Directive seeks to prevent or reduce negative environmental effects from the landfilling of waste by introducing uniform standards throughout the European Union. The main regulatory provisions of the Directive stipulate:

- Classes of landfill;
- Requirements for obtaining a permit for operating a landfill;
- Waste acceptance procedures;
- Control and monitoring procedures for operating a landfill; and
- Closure procedures.

The most significant part of the Directive is Article 5 which proposes a strict timetable for reductions in landfilling Biodegradable Municipal Waste (BMW). These are onerous requirements

and have been the principal influence on the formulation of 'Waste Strategy 2000' and 'Wise about Waste'. The EC Landfill Directive sets mandatory targets which, for the UK, require the following:

- *By 2010 to reduce BMW landfilled to 75% (by weight) of that produced in 1995*
- *By 2013 to reduce BMW landfilled to 50% (by weight) of that produced in 1995*
- *By 2020 to reduce BMW landfilled to 35% (by weight) of that produced in 1995.*

Local Authorities are also required to ensure that residual MSW is treated prior to landfill (Article 6). WAG carried out a consultation in Autumn 2003 on implementation of the Waste and Emissions Trading Bill (including the Municipal Waste Management (Wales) Regulations). The consultation outlined a proposed landfill allowance scheme that will limit the amount of BMW sent to landfill, in accordance with the requirements of Article 5 of the Landfill Directive.

The Waste and Emissions Trading Bill is intended to implement in the UK, Articles 5(1) and 5(2) of the EC Landfill Directive.

The proposed mechanisms, which have now been consulted upon, to be included in the landfill allowance scheme for Wales are:

- The Welsh Assembly Government will allocate to each Waste Disposal Authority a maximum quantity that it may landfill in each scheme year from 2004 to 2020.
- Landfill allowances for 2004 will be based on landfill need, taken as the amount of BMW sent to landfill in the latest year for which validation is available.
- The allocation of allowances in the first target year of 2010 will be based upon the proportions of waste arising in each local authority in 1998. A linear reduction in allowances between 2004 and 2010 will be assumed.
- There will be a review every 3 years of allocation of landfill allowances to take into consideration any demographic and boundary changes.
- A financial penalty of £200/tonne for each tonne of BMW landfilled in excess of the landfill allowance limit.
- A financial penalty of £1000 per offence for failure to maintain adequate records.

#### **4.1.5 Best Value – Wales Programme for Improvement**

Best Value is a key component of the Welsh Assembly Government's programme to modernise local government in Wales, and places best value authorities under a duty to seek continuous improvement in the way in which they exercise their functions. The Local Government Act 1999 sets out the principal framework of Best Value.

Best Value in Wales has evolved into the Wales Programme for Improvement, the main principles of which are continuous improvement, effective management of performance, a whole authority approach and targeted action.

#### **4.1.6 Waste Minimisation Act 1998**

This Act enabled Waste Collection Authorities or Waste Disposal Authorities to make arrangements to minimise the generation of Controlled Waste in their area (i.e. household, commercial or industrial waste). The Act also authorised the relevant Authority to contribute towards the expense.

## **4.2 EMERGING LEGISLATION**

### **4.2.1 Biowaste Directive**

A proposed Directive on composting (issued as a working paper) aims to boost composting and diversion of biodegradable waste from landfill. This would be achieved by the introduction of composting standards, more composting facilities and collections, and less stringent licensing conditions for operating smaller composting facilities. The Directive, which will provide added support to the requirements of the Landfill Directive, is likely to demand separate collection of household organics.

### **4.2.2 Animal By-Products Regulations 2003**

Under the earlier Animal By-Products Order 1999 (as amended) it was an offence to allow livestock or wild birds access to catering waste containing meat or products of animal origin, or which originated from premises handling meat or products of animal origin. This order effectively banned composting and biogas digestion as treatment and recovery methods for catering waste.

The new EU Animal By-Products Regulation (enforced in the UK since 1 July 2003) permits the use of composting and biogas treatments for catering waste and other low risk (category 3) animal by-products in approved composting and biogas premises.

### **4.2.3 Waste Electrical and Electronic Equipment (WEEE) Directive**

The WEEE Directive was published on 13 February 2003 and the UK now has eighteen months from this date to transpose the Directive into national law.

The Directive affects producers, sellers and recyclers of electrical and electronic equipment - including household appliances, IT and telecoms equipment, audiovisual equipment (TV, video, hi-fi), lighting, electrical and electronic tools, toys, leisure and sports equipment.

The purpose of the Directive is to minimise the production of WEEE and, in addition, ensure the reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste. The latest proposals for the Directive include requirements for:

- free takeback of WEEE from private households, including retailer takeback; and
- a collection target of 4 kg per head of population per annum

There is no expected increase in costs to the Council for dealing with WEEE.

### **4.2.4 End of Life Vehicles (ELV) Directive**

The Directive aims to prevent waste from vehicles and to ensure the reuse, recycling and other forms of recovery of end of life vehicles and their components. The Directive sets the following targets for industry:

- by 2006 85% recovery and 80% recycling by weight
- by 2015 95% recovery and 85% recycling by weight



Lower targets of 75% reuse and recovery, and 70% for reuse and recycling will be acceptable between 2006-2014 for vehicles produced before January 1 1980.

#### **4.2.5 Landfill Directive – Used Tyres**

Restrictions set out in the Landfill Directive stipulate the following targets:

- By August 2003, no whole tyres to be disposed of to landfill
- By 2006, no shredded tyres to be disposed of to landfill

#### **4.2.6 Landfill Directive - Article 6**

Article 6 of the Landfill Directive requires that only waste that has been subject to treatment is landfilled. This requirement will have implications on municipal waste which will be required to go through some degree of treatment prior to landfilling. At present it is unclear what 'treatment' actually infers although where kerbside collection of recyclable and compostable materials is in place this is likely to constitute 'treatment'.

#### **4.2.7 Hazardous Household Waste**

The EU Commission published a discussion paper in February 1997 regarding a proposed Directive on hazardous municipal waste. At present there are no plans to introduce legislation specific to hazardous municipal waste in the near future. However, implementation of the proposed Bio-waste Directive may necessitate development and implementation of a Hazardous Household Waste Directive in order to reduce contamination of biodegradable waste destined for composting.

It should be noted that where hazardous household waste material is collected separately, this will need to be managed as hazardous waste.

#### **4.2.8 Household Waste Recycling Act**

The Household Waste Recycling Act 2003 was the result of a private member's bill introduced to Parliament by Joan Ruddock, the MP for Lewisham and Deptford, in December 2002.

Backed by pressure group Friends of the Earth, and originally known as the "doorstep recycling bill" and later the "municipal waste recycling bill", the bill was toned down slightly from its initial aim of 50% recycling by 2010 after discussion with then environment minister Michael Meacher. The UK Government has set a lower target of 30% recycling by 2010 in 'Waste Strategy 2000'.

The Act requires all English local authorities to provide kerbside collections for all householders for a minimum of two materials by 2010. The Bill gives the Welsh Assembly Government the power to require similar schemes in Wales. Councils with particular difficulties in meeting the demands of the legislation could be granted a derogation, while providing "comparable" recycling facilities, such as a bring bank or civic amenity site could satisfy the Act's requirements. Local authorities will only have to collect one dry recyclable from the kerbside if they provide a garden waste collection service.

#### **4.2.9 Batteries Directive**

With a view to encouraging higher recycling of household batteries across the EU, the European Commission has been reviewing its legislation on battery recycling since 1997. The main revisions will focus on collection and recycling targets and the reduction of cadmium in nickel-cadmium batteries.

The main Commission proposals for a new Batteries Directive are:

- Producer responsibility for used batteries
- Recycling targets of 45-75% and collection targets of 30-80% for all used batteries
- Recycling targets of 50-80% and collection targets of 70-100% for used automotive batteries
- Recycling targets of 50-80% and collection targets of 60-90% for used cadmium batteries
- A ban on cadmium in batteries where viable substitutes are available.

Having completed a 2003 stakeholder consultation, a revision of the 1991 Directive on batteries and accumulators is now being prepared.

## CHAPTER 5 – FUTURE WASTE ARISING AND TARGETS

### 5.1 WASTE ARISING

There is considerable uncertainty regarding the likely future growth in MSW in Gwynedd, and indeed elsewhere in Wales and the rest of the UK. The range of factors affecting waste growth includes:

- Population changes
- Changes to the number and size of households
- Consumer behaviour
- Effectiveness of waste minimisation strategies
- Changes in the economic prosperity of a region

It is recognised that municipal waste arisings throughout the UK are increasing year by year, with current annual growth for the UK as a whole put at 2.7% per annum. Figures 5.1 and 5.2 depict waste arisings for Municipal Waste and Household Waste, respectively, up to the year 2020 for a number of growth rate scenarios:

- Current growth rate for Gwynedd, calculated at approximately 2.2%;
- 6% growth rate (average of last 5 years);
- 3.8% declining growth rate (**TAN21**);
- 1% growth rate.

**Figure 5.1: Predicted Municipal Waste Arisings**

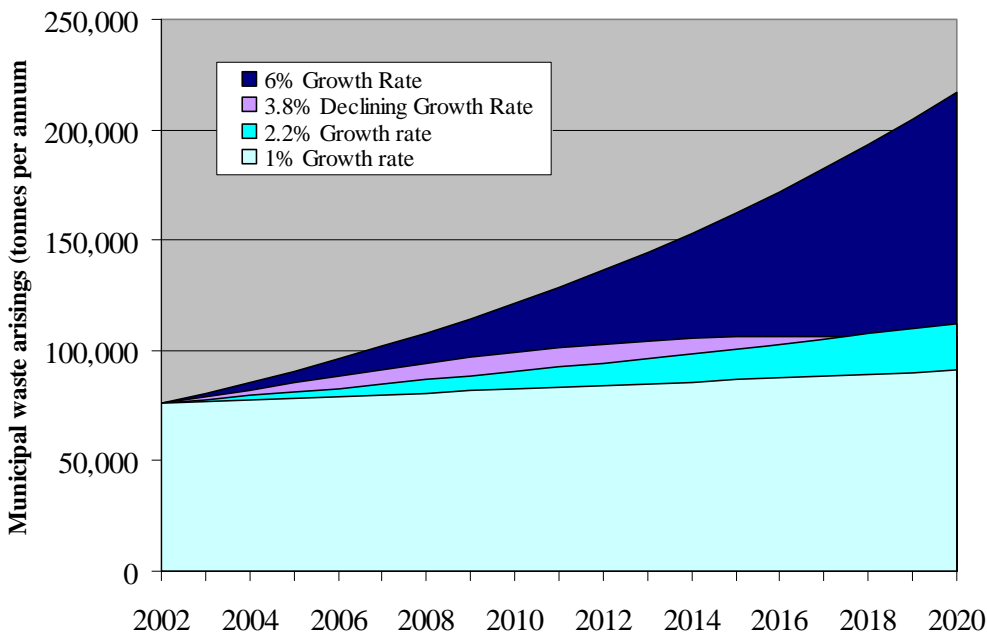


Figure 5.2 also depicts a 'Meet WAG Targets growth rate' which aims to comply with the waste reduction and stabilisation targets, for household waste only, set out in 'Wise about Waste'. These targets are:

- by 2009/10 waste arisings per household should be no greater than those in 1997/98;
- by 2020 waste arisings per person should be less than 300 kg/annum.

**Figure 5.2: Predicted Household Waste Arisings**

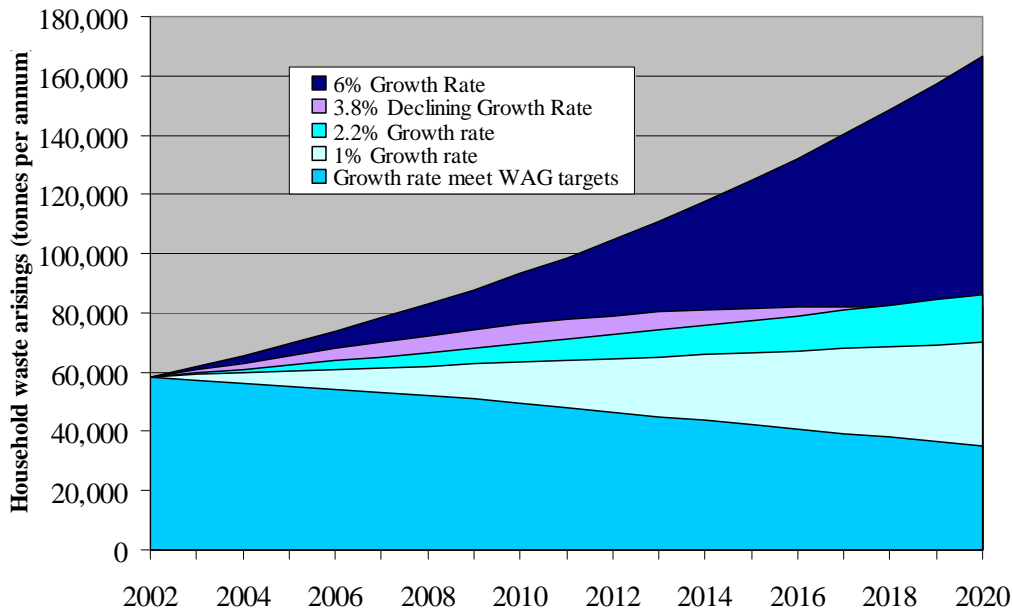


Figure 5.2 indicates considerable variances between the projected household waste arisings and the maximum tonnage to comply with the waste stabilisation targets noted above. In fact to achieve the waste stabilisation targets it will be necessary to reverse the growth trend, and achieve a decline in waste arisings of approximately 2.2% per annum.

The '3.8% declining growth' scenario is considered to be the most realistic, taking into account recent/current growth rates and the probability that growth is likely to decline over the strategy period due to the impact of waste minimisation strategies and the likelihood that current economic growth is unlikely to be sustained over the next 20 years. This is identical to the growth rate scenario used in the development of the North Wales Regional Waste Plan (TAN 21).

## 5.2 TARGETS

### 5.2.1 Recycling & Composting Targets

'Wise about Waste' – the National Waste Strategy for Wales (2002) (Welsh Assembly Government) sets out minimum recycling and composting targets for each local authority to deliver:

- *By 2003/04 achieve at least 15% recycling/composting, with a minimum of 5% composting (with only compost derived from source segregated materials counting) and 5% recycling*
- *By 2006/07 achieve at least 25% recycling/composting, with a minimum of 10% composting (with only compost derived from source segregated materials counting) and 10% recycling*
- *By 2009/10 achieve at least 40% recycling/composting, with a minimum of 15% composting (with only compost derived from source segregated materials counting) and 15% recycling*

Recycling and composting requirements for the target years are identified in Table 5.1 below. These requirements have been used in the option development process.

**Table 5.1: Recycling & Composting requirements for target years**

Year	Recycling (tonnes)	Composting (tonnes)
2006/7	13,256	8,837
2009/10	24,218	14,531

A more detailed review of recycling and composting requirements is presented in the Technical Appendices (**Appendix 4**), which will be used to develop the statutory Recycling Plan.

### 5.2.2 Landfill Directive Targets

The EC Landfill Directive sets mandatory targets which, for the UK, require the following:

- *By 2010 to reduce BMW landfilled to 75% (by weight) of that produced in 1995*
- *By 2013 to reduce BMW landfilled to 50% (by weight) of that produced in 1995*
- *By 2020 to reduce BMW landfilled to 35% (by weight) of that produced in 1995.*

Based on the draft guidance from WAG on implementation of the Waste and Emissions Trading (WET) Bill, Gwynedd will need to reduce total BMW to landfill to the following tonnages:

2010: 28,945 tonnes

2013: 19,244 tonnes

2020: 13,471 tonnes

### 5.2.3 Waste Reduction

'Wise about Waste' sets out targets relating to waste reduction for household waste and also for waste produced by the Council themselves. The targets are as follows:

Local authorities themselves should:

- *By 2005 achieve a reduction in waste produced (by the authority) equivalent to at least 5% of the 1998 arisings figure*
- *By 2010 achieve a reduction in waste produced (by the authority) equivalent to at least 10% of 1998 arisings figure*

The waste stabilisation targets are identified in the previous section

#### **5.2.4 Hazardous Household Waste**

'Wise about Waste' sets the following target for safer handling of hazardous household waste:

- By 2003/4 all civic amenity sites should have facilities to receive and store, prior to proper disposal, bonded asbestos sheets, and facilities for receiving and storing, prior to recycling, oils, paints, solvents and fluorescent light bulbs.

In addition, WAG has set a target to reduce the amount of hazardous waste generated by at least 20% by 2010 compared with 2000.

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## **CHAPTER 6 – OPTIONS FOR MANAGING WASTE**

### **6.1 GENERAL PRINCIPLES**

#### **6.1.1 The Integrated Waste Management System**

The term integrated waste management (IWM) is most commonly used when addressing national or regional waste strategies. IWM means the use of a range of different waste management options as opposed to a single option. Key aspects of an effective IWM include:

- embracing the concepts of the waste hierarchy (see below)
- recognising each step in the waste management process as part of a whole
- involvement of all key players or stakeholders
- adopting a mixture of waste management options
- Incorporating flexibility in order to meet social, economic and environmental conditions

Experience has shown that adopting an integrated approach results in the most effective waste management decisions.

#### **6.1.2 The Waste Hierarchy**

The waste hierarchy is broadly accepted as the guiding principle for securing a more sustainable waste management system. The hierarchy suggests that the most effective environmental solution is to minimise the generation of waste. Where further reduction is not practicable, products and materials can sometimes be used again, either for the same or for a different purpose (re-use). Failing that, value should be recovered from waste through recycling or composting, or through energy recovery. Only if none of these offers an appropriate solution should waste be incinerated without energy recovery, or disposed to landfill.

#### **6.1.3 Waste Minimisation & Reuse**

Fundamental to any waste management strategy is the incorporation of waste minimisation and re-use initiatives. The final strategy document for Gwynedd will include details of waste minimisation schemes to be implemented by the Authority.

#### **6.1.4 Waste Collection & Segregation Options**

In order to facilitate increased recycling there are three principal methods of collecting household waste. The decision on which method to employ is influenced by the final waste management solution selected. The options are as follows:

- collecting the whole unsorted waste and delivering it to a dirty Materials Recovery Facility ('MRF')
- collecting source-segregated materials from each household (either as individual materials or in a co-mingled form)
- reliance on the public to segregate dry recyclables at source and utilise an existing and/or improved bring network and Household Waste Recycling Centres (HWRCs).

Each of these methods has their own advantages and disadvantages. It is the 'at source' segregation approach that appears to be favoured by the Welsh Assembly Government. However, bring centres

and HWRCs also have an important role to play in encouraging recycling. There are also examples in the UK where the 'dirty MRF' option can form part of an overall integrated waste management system, particularly when seeking to divert materials from the residual waste stream.

It is important to recognise that the collection and segregation of waste cannot be considered in isolation but within the context of the preferred way forward for treatment and disposal.

### **6.1.5 Waste Treatment and Disposal**

Municipal solid waste is a complex and heterogeneous material with a composition that varies on a day-to-day basis and sometimes more significantly on a seasonal basis. The principal processes for treatment and disposal of waste are:

- Materials Recovery Facilities, either 'clean' or 'dirty', for the separation of reusable and recyclable materials
- Composting for treatment of biodegradable materials
- Anaerobic/Aerobic Digestion for treatment of the biodegradable fraction
- Incineration
- Advanced thermal treatment processes (Gasification & Pyrolysis)
- Mechanical Biological Treatment
- Landfill

These processes are discussed in more detail in the Technical Appendices (Appendix 3).

Whichever principal process is considered to be the most suitable, there will be a need to include some form of recycling or recovery stage to form part of an integrated waste management strategy. There will also be a need for landfill to form part of a fully integrated system to receive residues that cannot be reused and waste that cannot be treated or recovered or recycled.

## **6.2 OPTIONS DEVELOPMENT**

The Welsh Assembly Government's statutory and non-statutory landfill diversion, recycling and recovery targets, together with the Landfill Directive, provide a framework for identifying a future waste management strategy for Gwynedd. However, these targets can be met (or exceeded) by various means, and therefore a range of options has been developed.

The preferred option should ideally incorporate<sup>3</sup>:

- An end to growth in municipal waste;
- High rates of recycling and composting;
- Greatly reduced reliance on landfill;
- Facilities for treating and disposing of waste as an alternative to landfill;
- The Proximity principle;
- Principles of affordability and deliverability;
- The Best Practicable Environmental Option.

Each of the options developed comprise a mixture of bring recycling, kerbside recycling, HWRCs, waste treatment and waste disposal. The following generic waste management options have been considered

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<sup>3</sup> Guidance on Municipal Waste Management Strategies in Wales. WAG. August 2002.



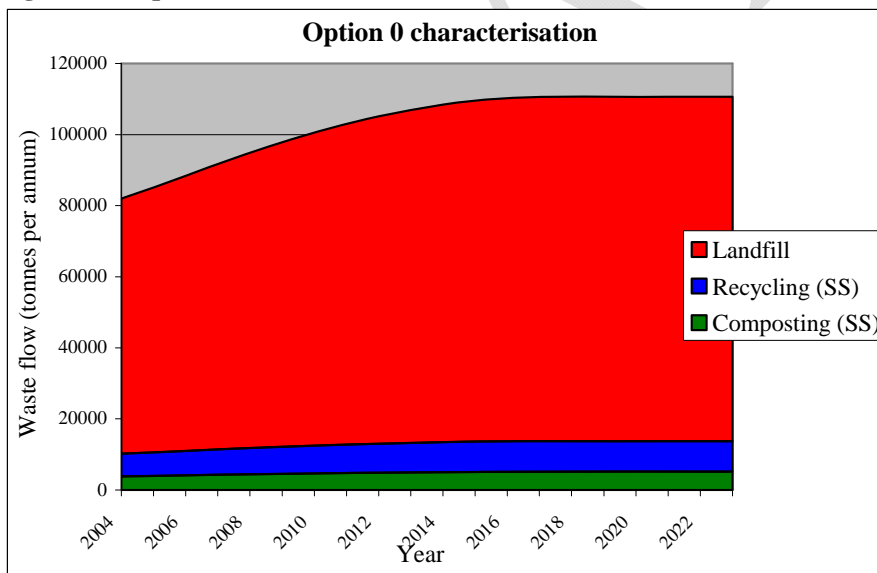
- Option 0: Baseline recycling and composting levels (2002/03) with residual waste to landfill
- Option 1: Meet WAG targets, all biodegradable residuals to in-vessel composting, residuals to landfill
- Option 2: Meet WAG targets, sufficient residuals to in-vessel composting to meet LFD targets, residuals to landfill
- Option 3: Meet WAG targets, all biodegradable residuals to Anaerobic Digestion, residuals to landfill
- Option 4: Meet WAG targets, sufficient residuals to Anaerobic Digestion to meet Landfill Directive targets, residuals to landfill
- Option 5: Meet WAG targets, all residuals to MBT
- Option 6: Exceed WAG targets, all residuals to MBT

A brief discussion of the potential options is set out below. A more detailed review is provided in the Technical Appendices (Appendix 5)

***Option 0: Baseline recycling and composting levels (2002/03 performance) with residual waste to landfill (see Figure 6.1)***

This option represents the current situation whereby lower levels of recycling and composting are achieved compared to the WAG targets for 2006/07 and 2009/10. No additional treatment of waste is undertaken and the majority of waste is sent to landfill. This is not a viable option and is merely included as a baseline comparison.

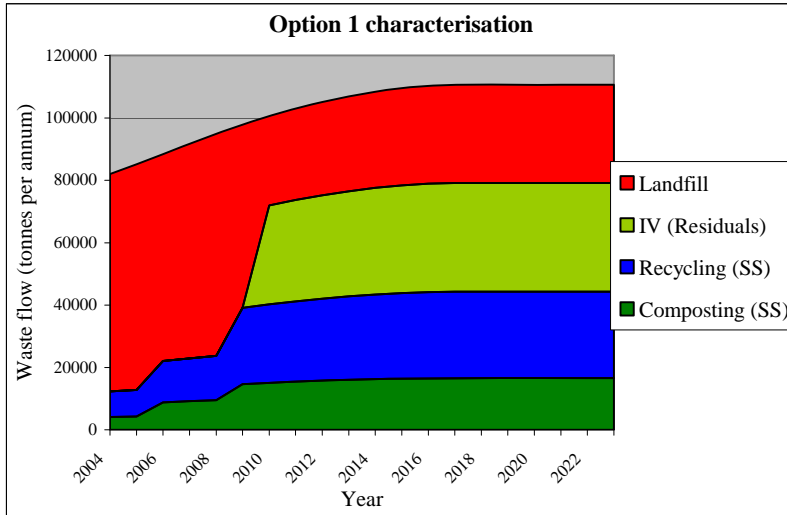
**Figure 6.1: Option 0 characterisation**



**Option 1: Meet WAG targets, all biodegradable residuals to in-vessel composting, residuals to landfill (see Figure 6.2)**

This option represents the minimum required performance through source segregated recycling and composting to achieve the recycling and composting targets for 2003/04, 2006/07 and 2009/10. Thereafter all biodegradable residuals are sent for composting, with the remainder to landfill.

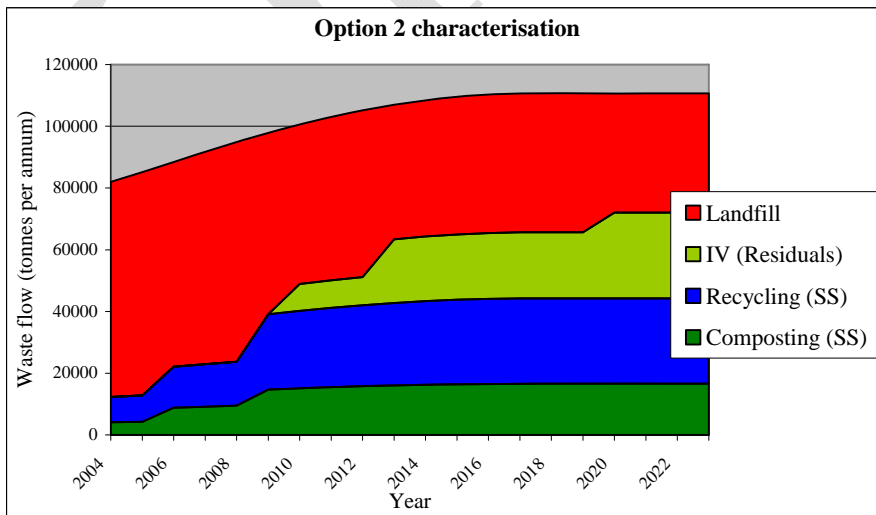
**Figure 6.2: Option 1 characterisation**



**Option 2: Meet WAG targets, sufficient residuals to in-vessel composting to meet Landfill Directive targets, residuals to landfill (see Figure 6.3)**

This option represents the minimum required performance through source segregated recycling and composting to achieve the recycling and composting targets for 2003/04, 2006/07 and 2009/10. Thereafter sufficient biodegradable residuals to achieve the Landfill Directive targets are sent for composting, with the remainder to landfill.

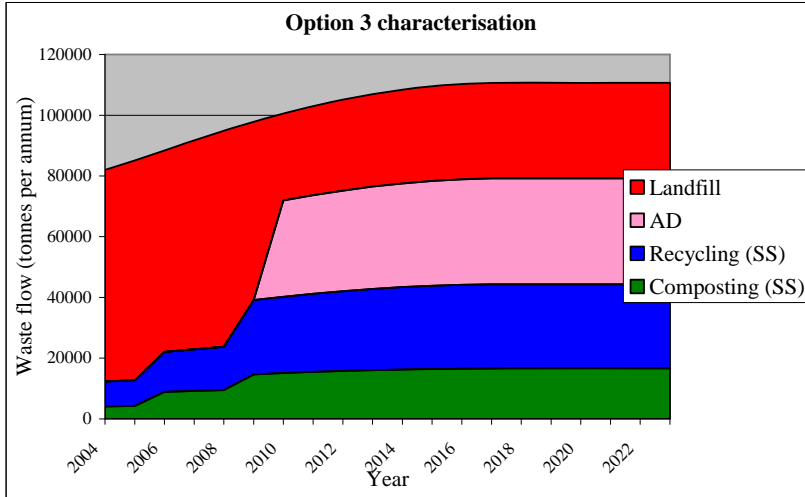
**Figure 6.3: Option 2 characterisation**



**Option 3: Meet WAG targets, all biodegradable residuals to Anaerobic Digestion, residuals to landfill (see Figure 6.4)**

This option represents the minimum required performance through source segregated recycling and composting to achieve the recycling and composting targets for 2003/04, 2006/07 and 2009/10. Thereafter all biodegradable residuals are sent for anaerobic digestion, with the remainder to landfill.

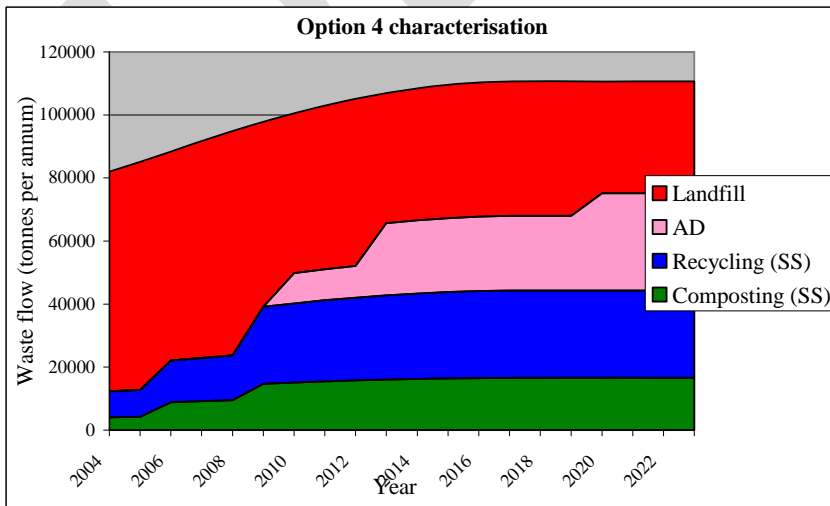
**Figure 6.4: Option 3 characterisation**



**Option 4: Meet WAG targets, sufficient residuals to Anaerobic Digestion to meet Landfill Directive targets, residuals to landfill (see Figure 6.5)**

This option represents the minimum required performance through source segregated recycling and composting to achieve the recycling and composting targets for 2003/04, 2006/07 and 2009/10. Thereafter sufficient biodegradable residuals to achieve the landfill directive targets are sent for anaerobic digestion, with the remainder to landfill.

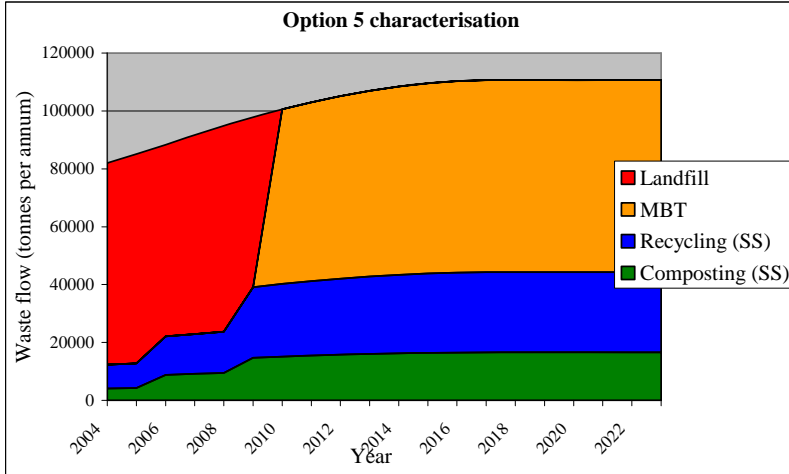
**Figure 6.5: Option 4 characterisation**



**Option 5: Meet WAG targets, all residuals to MBT (see Figure 6.6)**

This option represents the minimum required performance through source segregated recycling and composting to achieve the recycling and composting targets for 2003/04, 2006/07 and 2009/10. Thereafter all residual waste is sent to a Regional Mechanical Biological Treatment (MBT) facility. It is assumed that the Regional MBT plant will incorporate an element of RDF (Refuse-Derived Fuel) production and Energy from Waste (EfW) from treatment of the RDF.

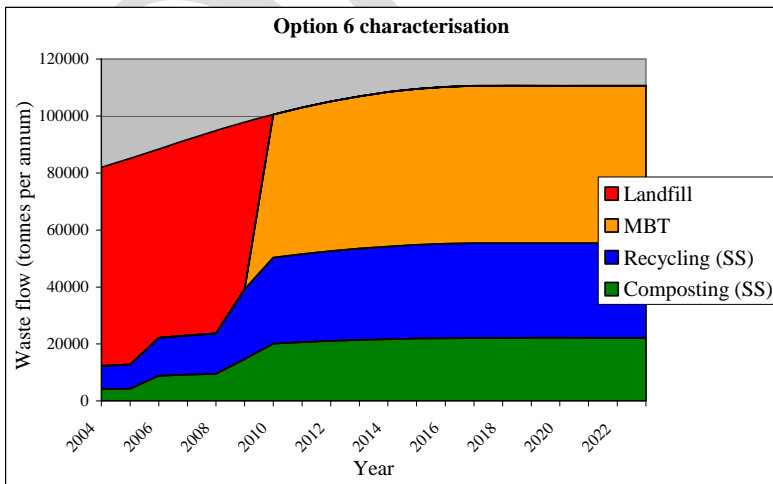
**Figure 6.6: Option 5 characterisation**



**Option 6: Exceed WAG targets, all residuals to MBT (see Figure 6.7)**

This option requires a high level of composting and recycling of source segregated materials, with residual waste being sent to a Regional MBT facility for treatment. It is assumed that the Regional MBT plant will incorporate an element of RDF (Refuse-Derived Fuel) production and Energy from Waste (EfW) from treatment of the RDF.

**Figure 6.7: Option 6 characterisation**



## CHAPTER 7 – GENERIC OPTIONS APPRAISAL

### 7.1 OVERVIEW OF GENERIC OPTIONS

Seven generic options have been developed for the future management of municipal waste in Gwynedd. These options have been developed to achieve the various recycling, composting and waste diversion targets identified in earlier sections of this report. The ability of each of the options to achieve these targets is summarised in the Table 7.1 below.

**Table 7.1: Options characterisation**

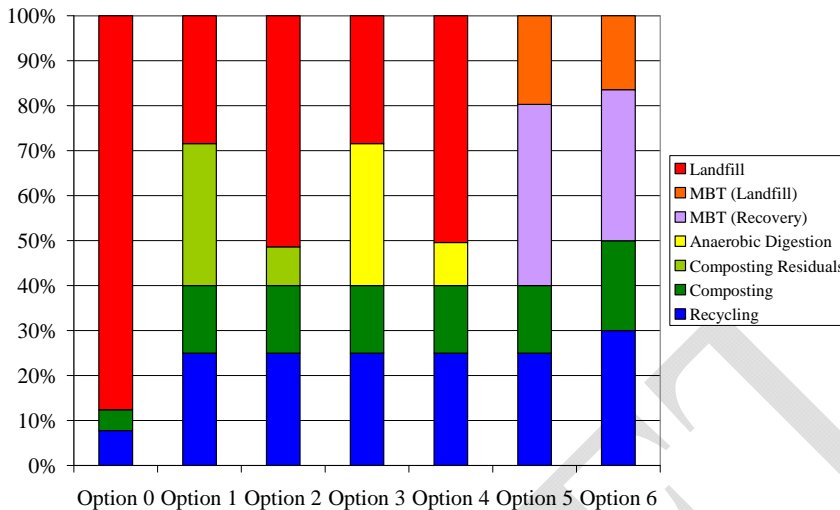
Target		Option						
		0	1	2	3	4	5	6
2003/4	Recycling Target		✓	✓	✓	✓	✓	✓
	Composting Target		✓	✓	✓	✓	✓	✓
2006/7	Recycling Target		✓	✓	✓	✓	✓	✓
	Composting Target		✓	✓	✓	✓	✓	✓
2009/10	Recycling Target		✓	✓	✓	✓	✓	✓
	Composting Target		✓	✓	✓	✓	✓	✓
2010	Landfill Directive Target		✓	✓	✓	✓	✓	✓
2013	Landfill Directive Target		✓	✓	✓	✓	✓	✓
2020	Landfill Directive Target		✓	✓	✓	✓		✓

As expected Option 0, the baseline condition, fails to meet any of the targets.

All other options are expected to achieve all the WAG recycling and composting targets and the Landfill Directive targets, however Option 5 fails to achieve the 2020 Landfill Directive target by a predicted 2,605 tonnes.

### 7.2 CHARACTERISATION OF OPTIONS

Each of the Options has been characterised to identify waste flows for each principal waste management and treatment option. This exercise has been carried out for all target years. The analysis is presented in detail in the Technical Appendices (Appendix 5) and shown in graphical format in Figure 7.1 below.

**Figure 7.1 Outline of Generic Waste Management Options**

### 7.3 GENERIC OPTIONS APPRAISAL

Having developed a number of potential options it is necessary to assess each of the options to identify a preferred approach for managing municipal waste in Gwynedd.

The options appraisal process has comprised an assessment of the Best Practicable Environmental Option (BPEO) and the Sustainable Waste Management Option (SWMO). A detailed explanation of the methodology used is presented in the Technical Appendix document (Appendix 6).

The Environment Agency's Life Cycle Assessment (LCA) tool, WISARD has been used to assess the environmental impacts for each of the options. Further details of the LCA tool and methodology are provided in Technical Appendix document (Appendix 6).

- Each option has been assessed against a set of 21 environmental, economic and social indicators. Each option is then scored according to how well it performs against each indicator. The scores for each indicator are added together to give a single performance score for each option. The option with the highest score is considered to be the BPEO and SWMO.

### 7.4 WHICH OPTION IS THE BPEO?

By carefully considering the environmental, social and economic impacts of each of the possible waste management options it can be shown that Option 6 followed by Option 5 represent the BPEO and the SWMO for long-term management of municipal waste in Gwynedd. The results of the scoring are shown in table 7.2 below.

	Option 0	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
<b>Valued Performance Scores</b>							
SWMO Assessment (all criteria) <sup>1</sup>	7	1	5	3	6	4	2
BPEO Assessment (BPEO criteria) <sup>1</sup>	7	3	6	4	5	2	1
<b>Weighted Performance Scores</b>							
SWMO Assessment (all criteria) <sup>2</sup>	7	2	5	4	6	3	1
BPEO Assessment (BPEO criteria) <sup>2</sup>	7	3	6	4	5	2	1

**Table 7.2: BPEO and SWMO Scores**

Option 6 is the high recycling option whereby a recycling rate of approximately 50% is aimed for with the residual waste sent to a regional MBT facility for further recovery of recyclables, composting of biodegradable material and generation of a refuse derived fuel.

Option 5 achieves the WAG recycling and composting targets with residual waste sent to MBT. The third highest scoring option is Option 1 which incorporates in-vessel composting as the preferred residual treatment.

Further analysis of the BPEO and SWMO is presented in Appendix 6 of the Technical Appendices.

## 7.5 PREFERRED OPTION FOR GWYNEDD

Whilst Option 5 and Option 6 are identified as the Best Practicable Environmental Option and Sustainable Waste Management Option, for a number of reasons external to the BPEO/SWMO analysis it is not felt at the present time, that these generic options provide the most appropriate way forward for Gwynedd.

The main concern with both Options is the ability to deliver a Regional residual waste treatment facility. Whilst MBT has been identified as a preferred Option through the Regional TAN21 process, as yet no site has been identified for the location of such a facility. It is noted that a MBT facility is proposed for Wrexham however the logistics and costs of transporting waste over such a distance, particularly given the rural nature and size of Gwynedd, is likely to prove prohibitive.

In addition, Option 6 assumes an enhanced level of source segregated recycling and composting (overall recycling and composting rate of 50%). Whilst this may be achievable, the costs and logistics of achieving this diversion rate will be onerous and are not deemed to deliver Best Value for waste management.

It is noted elsewhere in this document that Gwynedd own two Dano Drums (one currently operational and the other mothballed) for pre-treatment of residual waste prior to landfill. These two units, with addition of supplementary waste handling, recycling and treatment equipment, could form the basis of a long term residual waste treatment technology for Gwynedd. The existence of two such units, located remotely from each other would suit the rural nature of Gwynedd, where transportation of waste over long distances can be costly and logistically difficult. In light of this, it is felt that Option 1 forms a more realistic long term strategic option for Gwynedd. Option 1 performs consistently well in the BPEO and SWMO assessment (see Table 7.2) and can thus be considered as an appropriate sustainable waste management option for Gwynedd.

Option 1 aspires to a combined recycling and composting rate of 40% by 2009, in line with national targets. Thereafter, additional waste through recycling and composting is achieved through one or two residual treatment facilities, assumed to be a modified and enhanced DANO drum technology.

The DANO drums will generate a low quality biostabilised product, that through further treatment and processing will be suitable for agricultural / forestry use within Gwynedd. There is currently uncertainty about the quality of compost derived for mixed waste treatment processes and thus the level of beneficial uses that can be achieved. However, successful composting and beneficial utilisation of mixed waste derived material is achieved elsewhere in Europe, and there is no reason to think that this cannot also occur in the UK in the future.

If development of a Regional MBT facility can be realised in the future then Gwynedd Council will be able to reappraise the preferred method for management of residual waste, inline with Generic Option 5. Should this situation occur it is quite possible that Gwynedd could rely on two options for treatment of residual waste; waste derived in the North of the County could be exported to the Regional facility, whilst waste from the Southern half, reflecting the additional logistical and financial difficulties could be treated at an in-County facility.

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## **CHAPTER 8 – IMPLEMENTATION PLAN**

### **8.1 RECYCLING PLAN**

It is a statutory duty of all Local Authorities to produce Recycling Plans. These plans must contain information about the quantities of controlled waste collected, recycled and disposed of. The proposed Recycling Plan for Gwynedd is presented in the Technical Appendix document (Appendix 8)

By achieving the targets set out in the Recycling Plan, the Council will ensure that the WAG recycling and composting targets for 2003/4, 2006/7 and 2009/10 are met.

### **8.2 BMW DIVERSION PLAN**

The BMW (Biodegradable Municipal Waste) Diversion Plan indicates how the Council proposes to meet the EU Landfill Directive targets for reducing the amount of biodegradable waste being sent to landfill. The Welsh Assembly Government has set targets for each Council in Wales to achieve for each year between 2004 and 2010. BMW diversion plans are quite similar to recycling plans, however they include information on the method for dealing with biodegradable waste that is not recycled or composted. The Council aims to meet the targets for diversion of biodegradable municipal waste in a number of ways:

- Separate collection of green waste at HWRC sites for composting and timber for recycling.
- Collection of separated organic waste from households with subsequent treatment via in-vessel composting.
- Collection of paper at bring banks and from households and businesses.
- Send residual biodegradable waste to a residual treatment facility

The Council's BMW Diversion Plan is presented in the Technical Appendix document (Appendix 7).

### **8.3 WASTE MINIMISATION AND EDUCATION**

Waste Minimisation is at the top of the waste Hierarchy. The Council fully supports the need for waste minimisation and is keen to promote suitable waste minimisation initiatives. The impact of increased waste minimisation would be beneficial to Gwynedd in the following ways:

- reduced cost of waste collection and disposal;
- reduced use of fuel and emission of pollutants in transporting waste;
- reduced landfill with its attendant pollution risk; and
- increased awareness of residents on waste related issues

Education and the promotion of awareness about waste management issues are particularly important if waste producers including the public are to adopt more sustainable waste management practices.

The proposed Waste Minimisation Plan incorporating education and awareness raising for the Gwynedd is presented in the Technical Appendix document (Appendix 9)

## 8.4 LITTER PLAN

The Welsh Assembly Government has given priority to improving the management of litter in Wales. To this end Gwynedd County Council has prepared a draft Litter Plan as part of this strategy and this is presented in the Technical Appendix document (Appendix 17). The draft Plan includes details of cleansing policies, strategies and services currently provided by the County Council to address the problem of litter across the County. The draft Plan also sets out proposals for future attention. The issues covered include:

- General litter;
- Dog fouling;
- Schools generated litter;
- Litter from fast food outlets;
- Fly tipping;
- Chewing gum;
- Drugs related litter;
- Beach cleansing;
- Riverine litter;
- Abandoned vehicles;
- Weeds and detritus;
- Education and awareness raising;
- Enforcement; and
- Monitoring.

## 8.5 FINANCIAL ASSESSMENT

A detailed financial assessment has been undertaken to identify the overall costs of the proposed options. This is presented as Appendix 10 of the Technical Appendix document. The costs of each option are outlined below.

Option	0	1	2	3	4	5	6
Cost per tonne (£/t)	£114.87	£98.04	£101.28	£101.37	£103.45	£108.30	£103.25

Note: Capital costs of collection vehicles and Inflation rates are not accounted for.

Of major importance is the proposed increase in landfill tax up to a rate of £35 per tonne by 2010, which will make the cost of landfilling waste much more expensive than at present.

All options will need substantial capital investment in new recycling and treatment facilities such as material recycling facilities, composting plants and residual treatment facilities. It is unlikely that the Council will be able to afford this massive investment and will need to look at arrangements with community organisations and private sector organisations.

Additional costs will be incurred through compliance with specific legislation e.g.:

- Landfill Directive
- Ozone Depleting Substances Regulations
- End of Life Vehicles Directive
- Waste Electrical and Electronic Equipment Directive

The financial analysis presented in this section assumes compliance with all specific legislation. The costs associated with delivery of waste minimisation programmes are presented in Appendix 9 of the Technical Appendices.

The contractual framework options for delivering the required waste management service(s) are discussed in Appendix 11 of the Technical Appendix document.

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## 8.6 DELIVERY OF THE STRATEGY

The preferred strategy, based on Strategic Option 1, is as follows:

Expansion of recycling and reuse schemes for municipal waste such that the waste strategy targets for each of the target years of 2003/04, 2006/07 and 2009/10 are met and in fact exceeded. All residual waste, in the absence of a suitable Regional facility will be treated at one or two in-county residual treatment facilities.

This strategy will comprise a number of key elements, as follows:

- Continued introduction of the kerbside collection of dry recyclable and organic (compostable) materials. It will be necessary to extend the scheme over the period up to 2009/10 in order to achieve the level of diversion required to meet the targets.
- Enhancement of the Household Waste and Recycling Centre (HWRC) provision across the County to facilitate improved access to the principal population centres and increased diversion of materials for recycling and reuse.
- Continued development of waste handling and treatment facilities to include the following:
  - Provision of a Materials Recycling Facility (MRF) to deal with recyclable materials diverted at the kerbside and at HWRCs.
  - Development of an in-vessel composting facility for the treatment of kerbside segregated organic materials (including green waste and organic kitchen wastes). This is likely to be required to be in place to meet the 2006/07 and 2009/10 composting targets of 10% and 15%, respectively.
- The continued use of small scale farm-based open windrow composting for green waste. Open windrow techniques will also be required for further maturation of the product from the in-vessel facility.
- Providing sufficient residual waste handling capacity within Gwynedd.

It should be noted that there will be a need for the disposal to landfill of some wastes over the full duration of the strategy. The quantity of waste sent to landfill will reduce significantly up to 2010 and beyond. Future landfill capacity will therefore need to be secured. Predicted tonnage requirements and facility capacities for Option 1, the preferred strategy and Option 5, the alternative option are outlined in Table 8.1 and Table 8.2 below:

	Household Waste Recycling Centres	Material Recycling Facilities	Composting (In-vessel and OW)	In-Vessl Composting Residual Waste	Landfill
2006	18,512	9,293	8,898	-	66,277
2009	20,497	15,026	14,641	-	58,122
2010	21,064	17,626	15,852	31,290	28,237
2013	22,401	18,744	16,858	32,939	29,726
2020	23,184	19,400	17,448	33,626	30,346

**Table 8.1 – Predicted Waste Treatment Capacity (tonnes per annum) for Option 1 (Preferred Waste Management Option)**

	Household Waste Recycling Centres	Material Recycling Facilities	Composting (In-vessel and OW)	Residual MBT	Landfill
2006	18,512	9,293	8,898	-	66,277
2009	20,497	15,026	14,641	-	58,122
2010	21,064	17,626	15,852	59,527	-
2013	22,401	18,744	16,858	62,665	-
2020	23,184	19,400	17,448	63,972	-

**Table 8.2 – Predicted Waste Treatment Capacity (tonnes per annum) for Option 5 (Regional MBT Option)**

Within Gwynedd, the number of facilities required will be dictated largely by the geography, of the area rather than the treatment capacity requirements. It will be necessary to provide a number of Household Waste Recycling Centres throughout the County, to ensure adequate access for all residents. Equally it will be sensible to provide a number of sites for composting of green waste derived from the Household Waste Recycling Centres to minimise distances that waste is transported.

An estimate of the likely number of facilities for Options 1 and 5 is given below in Table 8.3

	Likely number of facilities				
	MRF	HWRC	OW Composting	In-Vessel Composting	Residual Treatment
Option 1	2	7	3	2	2 in county
Option 5	2	7	3	2	1 in county

**Table 8.3 – Likely number of waste facilities for Options 1 and 5**

A proposed implementation plan for delivery of the Strategy is set out below

Scheme	2004	2005	2006	2007	2008	2009	2010
Introduce kerbside collection of green material							
Introduce kerbside collection of kitchen waste							
In-vessel composting plant (kitchen waste) to come on line							
Additional MRF capacity to come on-line							
Introduction of additional HWRCs							
Expansion of kerbside collection of dry recyclables to households							
Enhancement of commercial recycling schemes							
In-vessel composting plant (residual waste) to come on line							

## **8.7 COMMUNITY INVOLVEMENT**

The Voluntary and Community sector can play a substantive role in recycling and can bring an extensive range of skills and experience that are not always available in the private sector. Details of how the Council will involve the community sector in municipal waste management are given in the Technical Appendix document (Appendix 16).

## **8.8 CONSULTATION**

Public consultation is an important element of the decision making process when choices are being made by public bodies relating to areas of waste management over which they have a degree of control. This applies particularly to the management of municipal wastes. It also applies to planning decisions made by the Planning Departments (Gwynedd Council and Snowdonia National Park) in respect of where new facilities for all wastes should be located.

Further details regarding consultation on the municipal waste strategy are given in the Technical Appendix document (Appendix 15).

## **8.9 GREEN PROCUREMENT**

By specifying environmentally friendly materials and processes to be used in the performance of contracts and procurement of consumables, the Council will be helping to stimulate the market for recycled materials. Examples of potential actions that the Council can take are:

- Requiring the use of recycled paper
- Requiring construction and demolition contracts to specify the use of recycled and secondary aggregates
- Requiring the use of waste derived composts and soil conditioners in landscaping

The Council plan to undertake an audit of its facilities and services to identify opportunities for maximising the specification of green services and materials.