



MILTON KEYNES
COUNCIL

Municipal Waste Strategy

Approved by Cabinet
20th December 2005

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Summary

Milton Keynes Council has a statutory duty to collect and dispose of municipal waste.

It faces serious challenges in municipal waste management arising from:

- The introduction of Landfill Allowances for biodegradable municipal waste (BMW) until 2020 which means that the Council could incur fines of up to £11m per year if it does not change its current methods of waste management
- An increasing population
- Other new legislation and tightening regulations on waste management
- A diminishing supply of landfill and increasing costs of landfilling

However:

- All the Council's contracts for waste collection and disposal end in 2007 – this presents an opportunity to make a major step change in waste management
- A range of technologies and methods for treating and disposing of waste are now available, though they vary in cost, effectiveness, risk and other factors
- The Council already has a relatively high recycling and composting rate and a strength in this area upon which it can build

The Council has reviewed and consulted upon its waste management policies, targets and options for the future.

Some of the policies from previous strategies need to be amended to take account of recent changes and as a result of the consultation.

The policies which require amendment are:

- Zero Waste Strategy (to clarify that Milton Keynes Council will not be attempting to meet the requirements set out in the Zero Waste Charter)
- No Incineration Policy (to clarify council policy)
- New Milton Keynes Waste Hierarchy (to enable allowances and targets to be met, and to be in line with regional and national strategy)
- Overall Good Environmental Practice and Sustainability (to replace the requirement for a "BPEO" with the requirement for an "SEA")
- Local Self Sufficiency (to allow for limited amounts of waste to be imported from London for landfilling in line with Regional policies)

New targets for recycling and composting are proposed as shown below, to be in line with the proposed regions targets.

Regional Recycling and Recovery Percentage Targets for Municipal Waste

	2005/6	2007 /8	2010	2015	2020	2025
Recycling & composting target	30%	34%	40%	50%	55%	60%

Information has been gathered on options for dealing with waste in the future. Nine kerbside collection options and thirteen residual waste disposal options have been examined for the following factors:

- Ability to divert materials for recycling/composting
- Ability to divert biodegradable municipal waste (BMW) from landfill
- Cost
- Best practicable environmental option (BPEO), which combines social, environmental and economic factors
- Risk (disposal options only)

Following consultation it appears that there is a preference for collection options that:

- Give maximum diversion to recycling and composting
- Collect residual refuse in plastic sacks, on a weekly basis
- Expand rather than change current collections

It should be noted that new patterns of development may however, require different approaches to waste collection methods, and these need to be evaluated

- There is a preference for treatment and disposal options that:
- Reduce pollution as much as possible
- Reduce waste for landfilling as much as possible
- Generate electricity from refuse
- Reduce climate change as far as possible
- Include extra recycling.

There appears to be confusion amongst residents over the term “incineration” and a desire for more information; the consultation has highlighted a need for improved communications on all waste management topics.

The above criteria will be used to evaluate collection and treatment options in the main action arising from the strategy, which is the procurement of new contracts to supersede those ending in 2007. Thermal treatments, including energy from waste will remain in the mix of options for which tenders may be submitted in order that sufficient scope is available to meet landfill allowances.

Although cost does not appear to have been a significant factor for respondents to the consultation, it is inevitable that the extra collections and treatments necessary to meet landfill allowances and targets will cost considerably more than current services. An important action is to identify the funding gap and find sources of funding.

The procurement could include:

1. Continuation of existing refuse and recycling systems with minimum disruption or changes to method of collection (i.e. refuse will continue to be collected weekly in plastic sacks, recyclables in pink sacks and blue boxes), but with:
 - More efficient distribution of pink sacks and blue boxes,
 - Inclusion of kerbside collections for textiles
 - More diversion of street cleaning leaves and other street cleaning recyclables, following evaluation
 - Inclusion of other recyclables into existing collection streams e.g. batteries, drinks cartons, other plastics, following evaluation
 - Permitting systems at CA sites, following evaluation
 - Charges for bulky goods, following evaluation
 - Mandatory recycling, following evaluation
 - Including paint recycling at CA sites
 - Separation and recycling of WEEE at CA sites, following implementation of legislation expected in 2006
2. The expansion of current recycling collections to include food waste collection in 2007/8 based on the outcome of the trials currently taking place in Newport Pagnell and Bradwell Common.
3. Procurement of a contract or contracts for composting of food waste or mixed garden and food waste to begin in 2007/8
4. Procurement of treatment facilities for residual wastes in order to meet landfill allowances to be in place by 201
5. Procurement of facilities to divert materials from mechanical street sweepings

Other actions include:

- A range of measures to decrease overall municipal waste and increase current recycling/composting rates which could include:
 - a. Continuation and expansion of current home composting promotion
 - b. Continued funding of nappy waste reduction initiatives beyond March 2006
 - c. Development of an effective communications strategy and employment of a Waste Communications Officer
 - d. Support expansion of Age Concern furniture re-use initiative
 - e. Increased enforcement activity combined with educational initiatives targeted specifically at low performing areas, requiring extra liaison staff.

- Addressing growth and planning issues including the following actions:
 - a. Researching new methods of waste collection and disposal suitable for new developments
 - b. Developing a technical advice note in association to the Supplementary Planning Document on Social Infrastructure Planning Obligations (2005) and Supplementary Planning Document on Sustainable Development (Residential Schemes). This will give waste planning requirements for new developments
 - c. Ensuring all new properties have adequate start-up facilities and information on recycling and waste management and that developers put the necessary infrastructure in place
 - d. Employing a part-time Waste Management & Planning Liaison Officer to ensure that above are met
 - e. Acquiring sites for new facilities to address the expansion and LATS needs including
 - A residual waste treatment plant
 - A waste transfer station
 - Two civic amenity sites (or community recycling centres)
 - Area for the separation of mechanical street sweepings
 - (Possibly) a treatment/separation area for bulky waste (depending on residual waste treatment option selected)
 - (Possibly) an animal byproducts – compliant waste treatment plant (depending on local availability)
 - A depot for collection operations
 - f. Carrying out a Strategic Environmental Assessment on the MWS and the WDPD together.
- Working in partnership with other organisations e.g. other local authorities, MK Partnership, the LSP and EP to ensure opportunities to provide best value and acquire funding are met.
- Possible expansion of the promotion of waste minimisation and recycling to businesses, including a business waste advisor.
- Development of a contingency plan to meet allowances should any of the above fail to happen, or if waste growth exceeds that currently planned, or other unforeseen events.

SECTION 1 - CONTEXT

Chapter 1.1

The process that has produced this strategy

Background, timescales and Consultation

Milton Keynes Council produced its first waste strategy in July 1999, after a lengthy period of consultation lasting over a year. At this time, there was not, and still is not, a statutory requirement for the Council to produce such a strategy. The principal driving factor in producing the first strategy was the need to guide the development of new contracts for waste collection and disposal expected in 2000. There was also the statutory requirement to update the Recycling Plan.

In 2002 the strategy was reviewed and updated with the introduction of statutory recycling targets, new best value performance indicators for waste, the introduction of the new waste collection and disposal contracts in 2000, and better data availability. Government guidance became available for producing a waste management strategy¹ and a further consultation process took place at this time with stakeholder groups, including a conference and advertising, principally via the Council's "Messenger" magazine. In 2002 this updated document became a "Zero Waste" Strategy, and the Council signed the Zero Waste Charter (Appendix 4).

In 2005 further developments required the strategy to be reviewed and updated. These include:

- New waste legislation, in particular the introduction of the Landfill Allowance Trading Scheme in 2005/6
- The introduction of new waste collection services in 2002 and 2003
- The introduction of a "Milton Keynes Waste Forum". This consultative group of local stakeholders was set up following the recommendations of the Overview Committee in 2002. The Constitution and Terms of reference of the Waste Forum are in Appendix 3.
- The strong need to guide the development of new waste disposal and collection contracts. Current contracts end in 2007.

¹ Guidance on Municipal Waste Management Strategies, DETR, 2001
<http://www.defra.gov.uk/environment/waste/management/guidance/mwms/pdf/mwms.pdf>

- New guidance on Municipal Waste Management Strategies and Waste Planning Policy², which involves the close development of processes together and the recommendation of carrying out a “Strategic Environmental Assessment” (SEA). Milton Keynes Council does not have a statutory duty to carry out an SEA but the guidance encourages local authorities, which do not have a statutory duty to carry out an SEA.
- A strategy review produced by Eunomia Research and Consulting and the Open University³ as part of a wider review of municipal waste management strategies under the Waste Improvement Programme (WIP) funded by DEFRA. This critically reviewed the previous strategy as part of a wider review programme.

Consultation on this Strategy

Public Consultation on this update and the issues and options paper of the Waste Development Plan Document took place from 15th August 2005 – 30th September 2005. This included:

- Public and radio debates
- Consultation letters to statutory bodies, interested parties, waste consultants and operators, parishes, neighbouring authorities, Members and a wide range of other consultees Internal magazine
- Posters on bus shelters, in libraries etc
- Documents placed in all libraries in the Borough
- Articles in relevant Council and Parish Council magazines
- Publication on the Council’s website www.mkweb.co.uk/waste
- On online survey
- A survey in the local press
- Distribution of surveys to schools, adult education, some workplaces, in the shopping centre and various other outlets
- Press releases

A report on the consultation has been produced, and is available as a supporting document in Appendix 1.

² Guidance on Municipal Waste Management Strategies July 2005, Changes to Waste Management Decision Making Principles in Waste Strategy 2000, and Planning Policy Statement 10 -Planning for Sustainable Waste Management, all available via DEFRA website:
<http://www.defra.gov.uk/environment/waste/localauth/planning.htm>

³ Review of English Municipal Waste Management Strategies. November 2004 by Eunomia Research and Consulting and the Open University

EPDC Report

The Waste Review Group of the Environmental Policy Development Committee (EPDC), which has a scrutiny role, has reviewed the strategy WDPD and procurement processes. Their report is in Appendix 2

Chapter 1.2

The Scope of the Strategy

Waste Streams Covered

The strategy mainly covers the area legally defined as “household waste”. The definition of this is lengthy and is given in the Glossary, but in summary it covers waste from domestic premises.

The Council has a statutory duty to collect “household waste” and to make arrangements for its disposal. It also has to meet various associated targets and is required to report on certain Best Value Performance Indicators.

The strategy also covers the types of waste described as “municipal waste”, defined in the Landfill Directive as being “household waste and other waste which because of its composition is similar to household waste”. The UK Government has interpreted this to encompass all similar waste collected by local authorities – including any trade waste collected by a local authority, fly-tipping, and items that are for re-use. Recent clarifications have made clear that the definition encompasses mechanical roads sweepings.

It should be noted that although the Waste and Energy Resources Division of the Council is responsible for other aspects of waste or cleaning, i.e. graffiti removal, abandoned vehicles and building cleaning, these are outside the scope of this strategy.

Although commercial or “trade” wastes are included in the scope of municipal waste, in practice the Council collects relatively little commercial waste compared to most local authorities - most trade waste in Milton Keynes is collected by the private sector. The strategy also includes a chapter on the Council's policy towards trade wastes not collected by the Council because

- They affect the amount of landfill locally available
- This has implications for the waste development framework, which must cover all waste (not just household and municipal wastes) and
- They are an output of the local community.

The Council does collect some via trade waste via the following routes:

- As part of the refuse round, particularly from mixed commercial /domestic properties (e.g. shops with living accommodation attached)
- At Civic Amenity sites or “Community Recycling Centres” as they are locally known, where those depositing trade waste must pay a fee

- Some flytipped/litter waste may be commercial/trade waste

The strategy also includes a chapter on wastes generated by the Council which are not considered to be municipal waste, e.g. waste from Council offices etc.,

Timescales covered

The main focus of this strategy is on the period to 2020, the period covered by the Landfill Allowance Trading Scheme which is subject to targets, allowances and fines. However, the strategy will also be looking ahead to 2031, since the city is to become a major focus of housing growth over this period.

SECTION 2 - WHERE ARE WE NOW

Chapter 2.1 Milton Keynes in 2005

A fast growing city

The Borough of Milton Keynes covers 31,000 ha and is one of the fastest growing districts in the country. Between 1981 and 2001, its population increased by 64.4%, whereas the population of England increased by only 5.0%. Most of this growth is focused in the new city, which continues to be amongst the fastest growing urban areas in the country. The city's population is now over four times (450%) larger than in 1967 and is currently estimated to be 181,680 (June 2004).

The high rate of population growth experienced up to now in Milton Keynes is expected to continue. Between 2004 and 2011, around 21,290 houses are anticipated to be built in the Borough, allowing for a projected growth in population of around 38,910 people, though clearly the rate and timing of development is dependent on future housing market conditions.

The population of the Borough of Milton Keynes is expected to increase by 38,910 people, to 255,760 by the year 2011, an increase of 18%. The majority of the growth will occur in the expanded city, which will reach a population of 219,310 by 2011.

The current number of households in the borough is estimated at 93,500 and this is expected to increase by some 22,232 households, or 24% by 2011. This is a result of a continuing stream of net inward migration resulting from the accelerated house-building programme together with a slight reduction in average household size and a reduction in the number of vacant properties. If the growth specified in the Milton Keynes & South Midlands study takes place the number of households is expected to increase to almost 125,000 by 2016. This is an increase of 31,291 households from 2004 or 33%.

A changing population

The 2001 Census gives information on household composition in Milton Keynes. Key changes since 1991 are:

- The number of families with two or more adults and dependent children decreased by about 5%.
- Single parent families showed an increase of 2.6%.
- Single person households have risen now making up around 27% of all household types in the Borough.
- Of these, almost 10% contain a single elderly person.

- The Borough's population age profile is younger than that for England as a whole, with half of the Borough's population aged under 35 years old (median age in England – 38); however, this is expected to increase to 36 by 2011 (when median age in England is predicted to be 41).
- The 30-44 year olds in Milton Keynes Borough are the largest proportion of the population. By 2011 The 40-44 age group will be the single largest age band. The number of 50-54 year olds will have seen a large increase in the Borough, and the number of over 60 year olds will experience a very large jump. There will be a peak in the 29 year olds, and a larger 0-4 age group.
- 13.2% of the population are from a black or minority ethnic group.
- 9.3% of the population in 2001 classified themselves as being non-white, this compares to 9.1% in England as a whole.

Nationally, average household size has fallen from 2.90 persons in 1971 to around 2.32 in 2002 for England. This can be largely attributed to an increase in the number of single person households, a result of divorce /separation, greater economic independence of people enabling them to live alone, as well as an increase in the elderly population and a nationally declining birth rate.

This trend is set to continue, both nationally and in Milton Keynes. It is notable that the number of single-person households is set to rise dramatically, accounting for much of the fall in average size. In 1991 only 24% of households in Milton Keynes comprised a single person. By 2001 28% of households were single-person, and this trend is set to continue into the future. By 2026 it is forecast that 33% of all households in Milton Keynes will contain a single person. This is more marked in the rural area, where over 35% of households are expected to be single person. Using these forecasts, the average household size in Milton Keynes is expected to fall to just 2.17 in 2030. It is likely that in the future houses will be smaller and that there could be more flats.

More on these statistics can be found in the Council's Population Bulletin 2004/5⁴. In addition the Social Atlas 2005⁵ gives a breakdown of social changes in Milton Keynes by estate.

The changing patterns of population affect how the Council manages waste. A trend towards smaller households tends to give rise to a greater per capita waste generation. It also means that sizes of containers need to be considered carefully, and ways of collection - for instance if there are likely to be a greater number of older people this may mean that there are more people having difficulties with collections. If more of the population are likely to be living in flats, then this poses particular problems for collection. In addition, the way that the Council communicates about waste management needs to take account of the changing demographics.

⁴ Milton Keynes Council: Population Bulletin 2004/5:

http://www.mkweb.co.uk/statistics/documents/Population_Bulletin_2004-5.pdf

⁵ Social Atlas 2005

<http://www.mkiobservatory.org.uk/download/sqqk0iutucafdb45zvkg2ez5/1984/SA2005New.pdf>

Changing patterns of development

Most of the population lives in the new city, which is laid out on a grid road system. The grid road system and flatness of the area enables relatively easy traffic movement around the city and relatively large waste collection vehicles can be employed in most of the area. This may not be the case in new developments, which may be more compact and require specialist vehicles or collection methods.

Only 17% of current housing stock is outside the “designated city” area. The “designated city” area comprises the new city and also the older areas of Bletchley, Wolverton, New Bradwell and Stony Stratford. Some of the older areas have seen an economic decline with the growth of the new city.

The rural area outside the city comprises small villages and the market towns of Newport Pagnell, Woburn Sands and Olney. Commuting from these areas has become more common. The rural area generally tends to have higher participation rates in recycling and composting schemes. It is also less efficient from a collection perspective since vehicles need to travel further between properties and smaller settlements require smaller collection vehicles.

Chapter 2.2

Current waste legislation and policy

A broad range of legislation affects waste management in the UK – including legislation on employment, health and safety, vehicles, trading standards, local authorities, finance, contracts, human rights, pollution, and other aspects of life. It would be impractical to list these here, though it should be borne in mind that waste management in Milton Keynes cannot be isolated from them.

In the UK, the primary responsibility for the control of waste and its environmental impacts rests with the Secretary of State for Environment, Food and Rural Affairs. Since June 2002, responsibility for land use planning, including waste planning rests with the Office of the Deputy Prime Minister. This document will cover legislation and policy relating to waste management. Land use legislation in relation to waste is covered in the Issues and Options paper on the Waste Development Plan Document.

Today the key drivers in shaping future waste management in the UK are European Directives, listed below, with a brief summary of their impacts. Each Directive is at a different stage of implementation in the UK

The European Context

Key European Directives and Regulations

Waste Framework Directive 75/442/EEC (amended by 91/156/EEC and 91/692/EEC)

This requires there to be regard to the need to minimise waste, encouraging materials recycling and energy recovery – the use of the waste hierarchy. There must also be regard to the need to protect the environment and human health in the context of potentially polluting developments. The use of the proximity principle is encouraged, and this also deals with the polluter pays principle. The amendment of 91/156/EEC requires that Member States take action to restrict the amount of waste produced by promoting clean technology and products that can be recycled or reused.

Landfill Directive 99/31/EC

This is probably the most significant legislation shaping the future of waste management in the UK. The UK began implementing the Directive by means of the

national “Waste Strategy 2000”⁶ and by updating various other pieces of legislation to bring them into line with this and other EC directives. This identified the need for a Waste and Resources Action Programme to assist the development of markets and reductions in waste, and set targets for recycling. Measures also envisaged here included the use of a landfill tax escalator, the landfill allowance trading scheme, public procurement of recycled goods, waste minimisation in IPPC requirements, and a greater role for producers.

The national “Waste Strategy 2000” has just been updated. This is documented in “Changes to Waste Management Decision Making Principles in Waste Strategy 2000”⁷. The changes bring Waste Strategy 2000 in line with the municipal waste strategy guidance documents and PPS10.

Targets for landfilling

The most important aspect of the Landfill Directive as far as Milton Keynes is concerned is that it sets ambitious targets for the **reduction of biodegradable municipal waste going to landfill**. “Biodegradable municipal waste” (BMW) is that portion of it which is capable of undergoing aerobic or anaerobic decomposition – e.g. paper, garden waste, and kitchen waste. The biodegradable fraction is estimated nationally at 68%.

The UK targets are:

- By 2010, reduce BMW landfilled to 75% of that in 1995
- By 2013, reduce BMW landfilled to 50% of that in 1995
- By 2020, reduce BMW landfilled to 35% of that in 1995.

The UK and Milton Keynes specifically rely heavily on landfill, so this will have a major impact on strategy.

The national “Waste Strategy 2000” addresses the challenges posed by the Landfill Directive. It sets targets for recycling and composting, both nationally and for local authorities.

Nationally the targets are:

- To recycle or compost at least 25% of household waste by 2005
- To recycle or compost at least 30% of household waste by 2010
- To recycle or compost at least 33% of household waste by 2015.

Each local authority now has statutory recycling targets. The targets are measured by best value performance indicators 82a and 82b (% of household waste recycled and % of household waste composted, respectively) added together. ***Failure to meet the statutory targets could lead to intervention by the Secretary of State.***

⁶ Waste Strategy 2000, DETR

<http://www.defra.gov.uk/environment/waste/strategy/cm4693/index.htm>

⁷ Changes to Waste Management Decision Making Principles in Waste Strategy 2000, July 2005
<http://www.defra.gov.uk/environment/waste/localauth/pdf/changes-wastestrat2000.pdf>

For Milton Keynes the targets set in the national “Waste Strategy 2000” were:

- **To recycle or compost 33% of household waste by 2003/4**
- **To recycle or compost 36% of household waste by 2005/6**

In 2003/4 the Council had a recycling rate of 24%. It had therefore fallen short of the first target. In December 2004, the Secretary of State announced that targets would henceforth be capped at 30%. It is likely that the Council will be close to 30% by 2005/6.

At the time of writing, DEFRA are consulting regarding targets for 2007/8⁸. No target will be set for 2006/7. There are four options for 2007/8:

- Do nothing – no targets will be set
- Maintaining targets at the 2005/6 level in 2007/8 (i.e. Milton Keynes would stay at 30%)
- Maintaining targets at 2005/6 level except for low achieving local authorities who will be expected to get to 20% (i.e. Milton Keynes would stay at 30%)
- As above but removing the cap from those authorities already subject to it (i.e. Milton Keynes would have to achieve 36% by 2007/8)

The consultation document states that there is a preference for the third option – maintaining the targets at 30% for Milton Keynes.

Tradable permits

The Government has also introduced tradable permits, **restricting the amount of biodegradable municipal waste that local authorities can send to landfill**. The **Waste and Emissions Trading Act 2003** enabled tradable permits to be put in place, and this paved the way for the **Landfill Allowances Trading Scheme (LATS)**. **This will have a major impact on waste management in the Council and will be discussed more fully in Section 3.**

Other requirements of the Landfill Directive include:

- Ban on co-disposal of hazardous and non-hazardous waste in landfill
- Ban on disposal of liquid waste in landfills from July 2002
- Ban on landfilling of tyres (whole from 2003 and shredded from 2006)
- More controls on landfill sites
- A requirement to pre-treat waste before landfilling
- New criteria for acceptance of waste at landfill

The consequence of these tighter controls is that landfilling of all types of waste will be more expensive. Some landfills unable or unwilling to meet the new requirements have already closed or will shortly close. Landfills are unlikely to be able to accept the range of wastes that they once accepted.

⁸ Consultation on options for local authority statutory performance standards on recycling and composting in 2007/08 <http://www.defra.gov.uk/corporate/consult/recycling-composting/index.htm>

Producer Responsibility Directives

The EU has initiated a number of “producer responsibility” directives. The principle behind these is that the producer of the waste should pay for its recycling or proper disposal. These are listed below.

Packaging and Packaging Waste Directive, 94/62/EC

This is translated into UK legislation by the Producer Responsibility Obligations (Packaging Waste) Regulations 1997 and The Packaging (Essential Requirements) Reg. 2003

This sets recycling and recovery targets on packaging waste for all involved in the packaging chain. The “Essential Requirements” regulations require that packaging should be minimal and recoverable through recycling, composting or energy recovery.

However, to date this has had little effect in Milton Keynes. Generally, targets have been easy to achieve by producers but these are increasing, so it may be possible that there will be some effect in the future.

Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This sets collection, recycling and recovery targets of ten types of electrical products – most electrical goods are covered. There are targets for both retailers and manufacturers to ensure recycling/recovery.

In the UK the “WEEE” will be transposed into legislation soon. The main effect of the legislation for the Council is that, if “WEEE” is separated out, for instance at a CA site, then the collection, recycling and recovery/disposal of that “WEEE” at an authorised treatment facility will be made free of charge by producers. At the time of writing it is thought that this will be effective from June 2006. It is hoped that funds may be available to assist local authorities to do this. Until then, there are temporary problems for these local authorities, since some items of electrical equipment are considered “hazardous” if separated from household waste. The DTI will meet any costs to local authorities of arranging the treatments required for any televisions and PC monitors containing CRT’s and fluorescent lamps, which they collect separately and send to hazardous waste, landfill in advance of the WEEE Regulations.

In addition to the WEEE Directive a separate **Batteries Directive** is also being proposed. On 18 July 2005 the European Council formally adopted its Common Position on the proposed Batteries Directive on which Political Agreement was reached in December 2004. Key requirements of the agreed draft Directive include:

- A partial ban on portable nickel-cadmium batteries
- Collection targets for spent portable batteries of 25% of average annual sales 4 years after the directive is implemented in the UK, rising to 45% after 8 years.

- Bans the disposal of untreated automotive and industrial batteries in landfill or by incineration.
- Member States will have 24 months to implement the directive once it has been agreed.

WEEE is also affected by **Regulation (EC) No 2037/2000 of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer**. This has required that from 1st January 2002, both the CFC's in the coolant and the foam of fridges and freezers are either recycled/reused or treated by approved environmentally acceptable destruction technology.

Directive on End of Life Vehicles 2000/53/EC

Although not technically municipal waste, this does affect the Council since it requires all abandoned vehicles to be taken to authorised treatment facilities for recycling/recovery. Producers will be responsible for the majority of the costs of this from 2007.

Hazardous Waste Directive 91/689/EC

This aims to control the movement and handling of hazardous waste. The scope of the directive is defined by the Hazardous Waste List (2000/532/EC), which has recently been amended to include televisions, computer monitors and fluorescent lighting. From 16 July the Directive is transposed by the [Hazardous waste \(England and Wales\) Regulations 2005](#) and the [List of Waste \(England\) Regulations](#). The effect on local authorities is to increase the cost of handling hazardous waste. At present there is no requirement for local authorities to separate municipal waste into hazardous and non-hazardous components.

EU Animal By-products Legislation

Regulation (EC) No 1774/2002 concerning animal by-products came into force on 1 May 2003. As a result, the Animal By-Products Regulations 2003 (Statutory Instrument No. 2003/1482 which came into force in England on 1 July 2003). The legislation restricts what can happen to catering waste (including separately collected kitchen waste). It was brought in following recent animal disease outbreaks and affects the ability of a local authority to compost kitchen waste. It means that separately collected kitchen waste, or kitchen waste mixed with garden waste must be treated in enclosed plants meeting stringent specifications.

Kitchen waste as part of normal household waste is not affected unless the household waste is to be treated as a whole to make a compost-like material or soil improver. Home composting is also unaffected by this legislation.

Waste Incineration Directive 2000/76/EC

This directive, which came into force in the UK in 2003, has increased standards relating to incineration of waste. It should be noted that “incineration” as defined by this Directive includes not just conventional incineration plant, but also most gasification and pyrolysis plants.

Integrated Pollution Prevention and Control Directive 96/61/EC

In the UK this has been translated into UK law by the *Pollution Prevention and Control (PPC) Act 1999 and PPC Regulations 2000.*

The PPC regulations aim to prevent, reduce or eliminate pollution at source through the efficient use of natural resources.

The effect on the Council is that most landfills, incinerators, hazardous waste facilities and other larger waste management sites fall under IPPC controls. They will require permits to operate and need to demonstrate Best Available Techniques (or BAT).

EU Thematic Strategies affecting waste management

Under the EU's 6th Environment Action Programme there are seven “thematic strategies”, introduced as a specific way to tackle seven key environmental issues. The communications which most affect waste management are:

Thematic Strategy on Recycling and Prevention of Waste

This is looking at a range of ideas for waste prevention and promoting recycling - e.g. economic instruments such as ‘pay as you throw’ and taxes; producer responsibility; voluntary or mandatory waste prevention plans; how to make recycling easy and clean; the legislative burden on the recycling industry; and how to use best available technology and legislation. It is also considering extending the range of waste management activities covered by the IPPC Directive.

Thematic Strategy for Soil Protection

Amongst other topics, this is considering whether bio-wastes should be collected separately and how they should be treated.

Thematic Strategy on the Sustainable Use of Natural Resources

This encompasses issues of product design.

The National Context

Apart from European legislation, there is also significant English legislation. This includes:

The Environmental Protection Act 1990 (in conjunction with the Controlled Waste Regulations 1992 and the Waste Management Licensing Regulations 1994)

This is still one of the most important pieces of legislation controlling waste in the UK. It defines responsibilities in relation to household waste. The effect upon the Council is that:

- As a unitary authority, it has a statutory duty both to collect and dispose of household waste
- It defines categories of waste and which (e.g. black bin bag refuse) must be collected free of charge to the resident, while others, such as garden and bulky waste may be charged for
- “Duty of care” must be exercised in collecting and treating waste
- Waste can only be taken to sites licensed to accept it and where there is a “fit and proper” person in control of the site
- It gives the Council certain powers in relation to litter.

Waste Minimisation Act 1998

This enables Local Authorities to investigate measures are needed to reduce, prevent or avoid waste in their areas and to take such steps as they consider appropriate in order to achieve that end and for related purposes. It enables the Council for instance to promote home composting or re-useable nappies.

Household Waste Recycling Act 2003

This Act requires all English local authorities to provide kerbside collections for all householders for a minimum of two materials by 2010.

Clean Neighbourhoods and Environment Act 2005

This contains many measures regarding antisocial behaviour and waste. Of particular relevance to this strategy are the following:

- The extension of litter offences to all open places, together with requirements to supply name and address to authorised officers from local authorities for the purpose of applying fixed penalty notices
- Strengthened provisions on fly tipping and abandoned trolleys
- Abolition of the requirement for Waste Disposal Authorities to transfer their waste disposal functions to specially formed companies.

Landfill Tax

Landfill Tax was first introduced into the UK in 1996. A tax is made on every tonne of waste that is landfilled. From 2005/6 it is set at £18/tonne and will increase a minimum of £3/year until £35/tonne is reached. Some of the funds from the landfill tax have in the past been diverted to community and research projects under the Landfill Tax Credits Scheme from which Milton Keynes has benefited. In the future it is likely that more of these funds will be diverted to infrastructure projects. The Government has recently consulted on how funds should be used after 2005/6 and is proposing that local authorities would be rewarded for reaching recycling targets and for making significant improvements in their recycling rates.

Renewables Obligation Certificates (ROC's)

Suppliers of electricity are required to source an annually increasing percentage of the electricity from renewables. At present the biodegradable element of electricity produced from three energy from waste technologies is considered "renewable". The three technologies are gasification, pyrolysis and anaerobic digestion. Suppliers trade renewables obligation certificates (ROC's) in order to be able to meet their percentages required. This means that, in effect these three technologies are able to take advantage of extra income. It is understood that the DTI is shortly to consult as to whether certain other energy from waste technologies should also qualify.

The Regional Context

The South East Plan and RPG9

Changes to Regional Planning Guidance Note 9 (RPG9) are currently being proposed⁹. The consultation period closed on 11th November 2005. This document defines waste and minerals planning policy for the South East

If adopted, the changes to RPG9 will become a part of the development plan for the region and have to be taken into account in preparation of the WDPD and the Municipal Waste Management Strategy.

These policies are listed below, with a brief summary the key issue for Milton Keynes are:

Policy W1 seeks to reduce growth of all waste to 1% per annum by 2010 and 0.5% by 2020. This may be difficult to achieve in Milton Keynes due to the high rate of housing growth planned.

Policy W2 concerns sustainable design, construction and demolition. This draws particular attention to the Region's strategic growth areas such as Milton Keynes,

⁹ Proposed Changes to Regional Planning Guidance for the South East (RPG9) – Waste and Minerals <http://www.gose.gov.uk/gose/docs/171301/311174/311182/rpg9WasteMinerals>

and requires them to demonstrate and employ best practice in design and construction for waste minimization and recycling

Policy W3 states that waste authorities and waste management companies should provide management capacity equivalent to the amount of waste arising within the regions boundaries plus a declining amount of waste from London. The region should be in net balance with London by 2016. The Milton Keynes area is a net importer of waste from London.

Policy W4 requires waste planning authorities to plan for net self-sufficiency, but also allowing a degree of flexibility, taking into account the proximity principle. Co-operation is encouraged between County Councils and Unitaries.

Policy W5 has regional targets for diversion from landfill, to which Milton Keynes must contribute. It also has a waste hierarchy as follows:

1. Re-use
2. Recycling
3. Mechanical and/or biological processing (to recover materials and produce compost, soil conditioner or inert residue)
4. Thermal treatment (to recover energy) Priority should be given to processes higher up this waste hierarchy

Policy W6 has recycling and composting targets for municipal, commercial and industrial, and construction and demolition waste arisings. Of particular significance are the MSW targets as shown below

Year	Recycling and composting targets for MSW %
2005	30%
2010	40%
2015	50%
2020	55%
2025	60%

These targets may be very difficult to achieve under present circumstances. The best recycling rates in England are currently between 40-50%

Policy W7 requires waste planning authorities to plan for certain tonnages of waste arisings and imports.

Policy W8 Requires waste collection authorities such as Milton Keynes Council to provide separate collections of recyclable and compostable materials as widely and as soon as practicably possible.

Policy W9 concerns partnership working to develop new markets

Policy W10 concerns the need for regional processing facilities for recyclable materials

Policy W11 requires waste collection and disposal authorities to encourage the separation of biomass waste and consider its use in energy plants where this does not discourage recycling and composting

Policy W12 concerns recovery and diversion technologies. It requires the promotion of anaerobic digestion and advanced recovery technologies. Municipal Waste Management Strategies should only include energy from waste as part of an integrated approach to waste management.

All proposed facilities should:

- Operate to the highest pollution control standards
- Include measures to ensure that appropriate materials are recycled, composted and recovered where this has not been carried out elsewhere.

Proposed thermal treatment plants should wherever possible aim to incorporate combined generation and distribution of heat and power.

Policy W13 concerns planning for continuing but declining landfill capacity. Non-inert landfill capacity should be husbanded. Landfill gas collection and energy recovery should be standard at all non-inert landfill sites

Policy W14 concerns the restoration of landfill sites

Policy W15 concerns the need to make provision for hazardous waste in the region. It should be noted that there are currently no sites in Milton Keynes able to accept hazardous waste.

Policy W16 concerns waste transport infrastructure and the need to take account of this in planning documents

Policy W17 concerns the location of waste management sites. It lists the types of sites where waste management facilities may be suitable:

- Active mineral sites
- Previous or existing industrial land use
- Contaminated or derelict land
- Land adjoining sewage works
- Redundant farm buildings

The Sub-Regional Context

Milton Keynes and South Midlands Sub Regional Strategy

The Milton Keynes and South Midlands Sub-Regional Strategy (MKSM SRS) was published in March 2005. The purpose of the document is to provide a clear, agreed sub-regional strategy for the period 2001-2021 and a long-term vision for the sub region towards the year 2031 as part of the Government's Sustainable Communities Plan.

The growth proposed is much greater than Milton Keynes has seen to date and this will pose particular challenges for waste management in the area. At the time of writing it is not clear how funding for waste management facilities will be made to accommodate this growth.

The Local Context

The Milton Keynes Community Strategy

The Milton Keynes Community Strategy was published in May 2005. It includes a set of values that will guide the growth of the borough.

The Community Strategy contains the vision for Milton Keynes and outlines the work that has to be done to build the city over the next 30 years. One of the key purposes and challenges for 2005-2008 is the zero waste policy.

Performance Indicators related to waste are:

- Recycling facilities - % of people satisfied with waste recycling facilities
- Household Recycling - % of the total tonnage of household waste arisings which have been recycled
- Waste – total household waste generated per head of population

Chapter 2.3

Current policies

Zero Waste

“Zero waste” is a concept that has recently started to spread amongst local authorities in the UK, following its introduction in other countries. The vision of “Zero Waste” is to reduce the production of waste by ensuring that products are made to be reused, repaired or recycled/composted. What is now called waste should instead be regarded as a mixture of resources to be used again to their full potential, not as something to be thrown away. It aims to reduce residual waste i.e. waste that cannot be reused, recycled or composted to zero.

‘Zero waste’ is a similar concept to ‘zero accidents’ or ‘zero defects’ in manufacturing. An extreme target encourages new levels of innovation and efficiency. The term ‘zero’ should not be viewed as an absolute figure, but is seen as a target to strive for.

The Council adopted a long-term vision of zero waste in its 2002 waste strategy. However, it cannot achieve this on its own, and expected others – particularly the Government and industry to play their part, by introducing measures to reduce the amount of waste produced. Zero waste cannot be achieved by local government alone as it involves all sectors of the supply chain from design, production, manufacturing, packaging etc. through to retail and final consumption. Communities will also have to play their part by participating in re-use, recycling and composting schemes

To this effect, the Council signed the “Zero Waste Charter” which called on Government to take action to reduce waste (detailed in Appendix 4). However, few of the actions called for in the charter have taken place, and some now conflict with the new requirement for Milton Keynes Council to meet its landfill allowances. In particular:

- The levels of investment required to develop the infrastructure necessary to meet landfill allowances may require contract periods longer than 10 years.
- Extending producer responsibility legislation to all products/materials that are hazardous or difficult to recycle has not happened, indeed there have been delays with existing producer responsibility legislation regarding WEEE.
- Targets for zero waste have not been set; the main driver in target setting is now the EU Landfill Directive and the consequent landfill allowances; current proposals for recycling and composting targets put a cap at 30%.

The Council wants to take a lead by raising awareness in the local community, developing re-use, refurbishment and recycling/composting schemes, and encouraging community, business and householder participation; however its

priority must now be meeting its landfill allowances. The challenges facing a zero waste strategy identified in the last strategy remain:

Challenges to Establishing a Zero Waste Strategy

- 'Zero' is a target to encourage innovation - not an 'absolute'
- Currently legislative requirements to reduce waste production are weak and need strengthening
- Waste generation processes involve all sectors of society and are not easily addressed at a local level
- Future waste minimisation processes and technology will change
- New technology and innovation is needed to get to high recycling levels
- Sustaining and building momentum. Unless there is continual education and promotion, recycling rates will fall
- Sustainable solutions - we will need a new way of thinking at a national level to achieve reduced consumerism and increased environmental stewardship at a local level
- Resources – investment in new technology and processes will be required to achieve progress

A vision such as zero waste creates a climate for continual improvement within the Council. However, a high degree of flexibility is required to do this. Given the considerable investment that is required to meet landfill allowances, the Council will need to give commitment to investors regarding tonnages that can be supplied to the various types of treatment plants that will be needed.

Feedback from Consultation

There was strong support for the Zero Waste aspiration from all types of feedback. This included 91.4% of respondents to the short questionnaire, where the concept was placed in the context of maximising recycling and composting. The difficulties of setting a "zero target" were acknowledged by respondents to technical questionnaires.

Clarification to Policy

The zero waste policy is clarified as follows:

"Milton Keynes Council aspires to the "zero waste" concept – that is, it aims to reduce residual waste i.e. waste that cannot be reused, recycled or composted to zero. It recognises that in practice it cannot achieve this, or set a target for "zero waste" without support from Government, Industry and communities. The Council recognises that it cannot itself achieve the actions set out in the Zero Waste Charter unless these are adopted nationally."

“No Incineration” Policy

On 9th July 2002 the Council took the following decision: “That this Council is opposed to the incineration of commercial and household waste anywhere within the Borough of Milton Keynes, and will maintain this position unless or until such time as residents are convinced that it is safe”.

This effectively reduces the types of energy recovery processes that can be used within Milton Keynes, and may result in the Council being unable to meet its landfill allowances.

Feedback from Consultation

Support for this policy was mixed. The Citizens Advisory Group on Waste (CAGOW) recommended that this policy be reviewed, believing that “modern thermal waste treatment plant is safer and more efficient and should be considered as a wider deliberation of new technology options”.

Responses to the short survey indicated that 69.1% of respondents supported the policy but the majority (42.0%) were “not sure” whether it was safe. Bletchley residents were more likely to support the policy and to believe incineration was unsafe, and this was witnessed in the public debates. This is linked to a belief that Bletchley landfill is the most likely site for an incinerator.

Throughout the consultation process it was clear that there was a high degree of confusion regarding what was meant by the term “incinerator”.

The Government Office for the South East has commented on the soundness of the “no incineration” policy.

Clarification of Policy Required

This policy is clarified as follows:

For the avoidance of doubt, incineration for the purposes of the strategy is the process, known as ‘mass burn incineration’, that accepts whole waste and where the waste is burnt with an excess of oxygen, usually on a grate leaving behind ash.

This element of the policy is grounded in the Review of Environment and Health Effects of Waste Management published by Defra in May 2004. This sets out that incineration produced the greatest emissions of oxides of nitrogen.

New Milton Keynes Waste Hierarchy

The hierarchy that is generally accepted in the UK, appearing in the national “Waste Strategy 2000” is as follows:

Waste Minimisation - it is always best to reduce waste at source

Reuse - if waste cannot be reduced, it should be re-used

Recycling (including composting) - if waste cannot be reduced or reused, it should be recycled or composted

Energy Recovery - if none of the above are possible, then energy should be recovered from the waste

Disposal - finally, if none of the above is possible, waste must be disposed of to landfill

Zero waste and the national Waste Strategy 2000 agree on the top priorities – minimisation, re-use and recycling/composting. However there is a difference of emphasis in the lower priorities particularly relating to the energy recovery element, and when the Council's "no incineration" position statement is also taken into account, this becomes more complex. Biological types of energy recovery – i.e. anaerobic digestion are preferred over thermal types of energy recovery such as incineration. In addition the relatively new technology of Mechanical Biological Treatment is preferred if it has no thermal element.

The hierarchy was revised at the last update of this strategy to take account of these factors:

- **Reduce** -waste should be reduced at source wherever possible
- **Re-use** - if waste cannot be reduced, it should be re-used
- **Recycle** -If it cannot be re-used, it should be recycled or composted
- **Reduction and stabilisation prior to landfill** - If waste cannot be recycled or composted, appropriate treatments for residual wastes:
 - Should result in solid residues that are no longer biodegradable and can be placed in inert landfills ("inert" and "biodegradable" being defined by the landfill directive);
 - Should permit further recovery of materials from mixed residuals, e.g. non-biodegradables such as metals, or aggregate-type materials;
 - May involve the recovery of energy (e.g. via anaerobic digestion), but are not necessarily required to do so;
 - Should aim to reduce the overall toxicity of the waste, and not produce hazardous substances as a result of the treatment process itself.

This policy now requires review since it is out of step with the proposed changes to RPG9 and also reduces the technologies that can be used to meet landfill allowances. Furthermore, updated guidance on the interpretation of "biodegradability" in the UK has not resulted in a clear definition of when a waste is considered "no longer biodegradable", but rather a scale of biodegradability upon which any treatment will be measured.

Feedback from consultation

There was little discussion of the hierarchy, and those who did comment upon it – CAGOW and some of the technical questionnaire responses – felt that little needed to change. However, one respondent felt that “recovery of value from waste” was a more appropriate term to use instead of reduction and stabilisation prior to landfill.

Change to Policy Required

The policy reverts to the traditional hierarchy:

Reduce

Reuse

Recycle

Energy Recovery

Disposal

Reduction in the hazardousness of waste

“The Council will strive to reduce the hazardousness of waste that is produced and disposed of within the Borough of Milton Keynes”

This policy has been in all previous strategies. However, the “hazardousness” of waste in Milton Keynes could be argued to have increased, primarily due to the reclassification of “hazardous” items to include items such as fridges , televisions and fluorescent lighting

Feedback from consultation

There was general support for this policy, and no change is required

Overall Good Environmental Practice and Sustainability

“When planning for waste management, the Council will take into account sustainability and other environmental factors, and plan for the best environmental practice. This includes reviewing transport and energy use, the use of the “proximity principle”(i.e. the principle that waste should be treated as close to its place of arising as possible), the “Best Practicable Environmental Option”(see glossary for full definition), protection of areas with presumptions against development and good quality agricultural land, and the conservation of resources such as minerals and water. If life cycle analysis is available, this should also be reviewed”

There are particular problems in assessing the BPEO. The Council has followed guidance provided by the ODPM and has used the “Wisard” tool, which has several limitations, particularly in relation to new technologies. Requirements to carry out a BPEO have now been superseded by the requirement to carry out a “Strategic Environmental Assessment” or “SEA” instead. At the time that preparatory work

was being carried out for consultation on this strategy guidance was in place was to carry out a BPEO.

This policy therefore now needs to be updated to reflect this.

Feedback from consultation

There was general support, but little discussion of this policy.

Change to Policy Required

The requirement for a “BPEO” be deleted and replaced with an requirement for a “SEA”.

Local self-sufficiency

“Milton Keynes will aim for self-sufficiency in waste disposal within its own borders, but will not exclude cross-border movements of waste, particularly if in co-operative partnerships with bordering local authorities, where they further the aims of “zero waste”, or where a BPEO can be demonstrated. Generally, such movements would not be further than 30 miles from Central Milton Keynes. The transport of re-useable or processed recyclable or compostable materials to their place of sale may be further than this distance. Milton Keynes will support the aims of self-sufficiency of other regions or waste disposal authorities”.

Again it should be noted that the “BPEO” is now superseded by a “Strategic Environmental Assessment” or “SEA” according to the latest guidance from DEFRA. It should also be noted that the Municipal Waste Strategy is not a planning document only relates to how waste from municipal waste arising in Milton Keynes will be handled.

Feedback from consultation

The CAGOW felt that this policy needed to be reviewed in order not to preclude co-operation with neighbouring authorities, however, the policy does not preclude this, and other responses also encouraged the development of partnerships with neighbouring authorities.

Change to Policy Required

The policy is amended as follows:

“Milton Keynes will aim for self-sufficiency in waste disposal of municipal waste from Milton Keynes within its own borders. It will not exclude cross-border movements of waste, particularly if in co-operative partnerships with bordering local authorities, where they further the aims of “zero waste”, or where a proximity principle can be demonstrated. Generally, such movements would not be further than 30 miles from Central Milton Keynes. The transport of re-useable or processed recyclable or compostable materials to their place of sale may be further than this distance.

An Integrated Waste Management Policy

“The Council will use the principle of “Integrated Waste Management” - i.e. the integration of different waste management methods - to give the greatest environmental benefit”. This policy is in line with both regional and national strategy guidance and does not need updating.

Feedback from consultation

There was general support for this policy in the consultation

Best Value

“The Council will obtain best value by securing economic, efficient and effective services including the use of benchmarking as a tool. It will also include seeking external funding where appropriate and available in the form of grants, allowances, planning gain, private finance initiative etc”.

This policy would not appear to need any updating as a result of legislative or policy requirements, and no change is recommended

Feedback from consultation

There was general support for this policy in the consultation

Flexibility and annual review

“The strategy will be subject to an annual review by officers, and a three-yearly review by Councillors, to determine progress and update it in the light of new technology, new legislation, or other significant new developments such as large changes in demographics of the population”

Again this policy is not thought to be out of step with current guidance

Feedback from consultation

There was general support for this policy in the consultation

Co-operation and Partnerships

The Council will co-operate, and where appropriate, form partnerships with other local councils, the private sector, the voluntary sector or any other appropriate organisation, to increase the effectiveness of its waste strategy.

This policy is also believe to be in step with current guidance

Feedback from consultation

There was general support for this policy in the consultation, and some respondents felt that the Council should particularly investigate partnerships with neighbouring counties.

Educating and Influencing

The Council will use its influence, particularly in its roles as an educator, an information provider, a purchaser, a major supplier of contracts, a planner, and an enforcer to increase the effectiveness of its waste strategy.

This policy is also not thought to need changing as a result of updated guidance.

Feedback from consultation

There was strong support for the need for more education and publicity about many aspects of waste management, and many respondents took the opportunity, either in the comments or at public debates to raise this issue. It is therefore recommended that this policy is not changed but implemented more fully.

The Council also has policies regarding waste, which is not municipal – a policies on commercial and industrial waste and policies on waste arising from council activities. These evolved in the first strategy and have been carried forward into subsequent updates.

Commercial and Industrial Waste Policies

1. The Council will, in partnership with other relevant organisations (such as the Chamber of Commerce and the Environment Agency), seek to increase the awareness amongst local companies of the importance of:
 - Waste auditing
 - Waste minimisation in their operations
 - Recycling and composting of their waste where appropriate
 - Energy recovery from their waste where appropriate
 - Proper disposal of their wastes, especially hazardous wastes
 - Waste minimisation in the products they produce, designing products suitable for recycling, and the overall environmental impact of their products
 - Resource management in raw materials, water and energy.
2. The Council will encourage and facilitate the above practices, in partnership with relevant organisations e.g. by facilitating paper recycling amongst small and medium sized businesses.
3. The Council, in partnership with other relevant organisations will seek funds or other assistance for projects to assist the above e.g. setting up a “Waste Minimisation Club” and the publishing of a local “Waste Minimisation Directory” (this is now available on mkweb at www.mkweb.co.uk/waste)

4. The Council will, in co-operation with the Environment Agency, seek to quantify, by type, the amount of waste produced by businesses in the Milton Keynes area, and its current disposal routes.
5. The Council will not operate any commercial or industrial waste recycling collection systems, but will inform businesses about those available in the area.

Feedback from consultation

There was general support for this policy in the consultation, and this was thought to be an area in which the Council were not doing enough. Respondents felt strongly that more should be done to encourage businesses to produce products with less wasteful packaging, easier to recycle products, and that businesses should do more recycling themselves. Respondents acknowledged that the main role of the Council is to influence and educate businesses, and to facilitate recycling collections. Therefore no change is though necessary to this policy, but more action should be taken upon it.

Policies regarding Waste Generated From Council Activities

1. All Council properties generating commercial waste will be put into one commercial waste disposal contract to obtain best value for the Council, with the cost being re-charged. Similarly all properties generating confidential waste and all properties generating clinical waste will be placed together for a similar purpose.
2. The Council will install (subject to finance being available) recycling facilities in all Council buildings for the recycling of office paper, and where appropriate also for other recyclable materials. These items will be collected as part of the same contract by which the recycling banks are emptied, and the materials taken to the MRF, or other appropriate recycling site. Data will be collected to monitor the costs and quantity of materials being collected for refuse or diverted to other routes, and external funding sought to finance this.
3. The Council will encourage and educate its staff to minimise waste, and will continue to promote waste minimisation in its activities (e.g. by distributing information about nappy waste reduction) where it is already doing so.
4. The Council will recycle or make provision for all wastes which only occur from time to time such as tables, old computers etc. and will ensure that relevant staff have information regarding local recycling or re-use activities by local charities such as the "Wake-up-to-Partnership" scheme

Feedback from consultation

There was little discussion of this issue in the consultation, but where it was discussed, respondents were often unaware of the amount of recycling that is happening, and thought that more should be done, indicating the need for more education.

No change is thought necessary to this policy; the actions proposed in 1) may need to be incorporated into the procurement process.

Chapter 2.4

Review of progress since the last strategy

The last strategy in 2002 set the targets and actions as summarised in the tables below:

Table 2.4.1 - Progress on Targets since the Last Strategy

Targets set in the last (2002) strategy	Current status	Notes
1) That 33% of household waste should be recycled or composted by 2003/4 2) That 36% of household waste should be recycled or composted by 2005/6	1) 24.0% of household waste was recycled or composted by the end of 2003/4 2) 26.5% was recycled or composted in 2004/5f	a) These targets replaced the targets set in the first strategy which were: <u>Target 1</u> <i>The proportion of household waste going to landfill by the year 2005 will be reduced to 60% of the total household waste produced in Milton Keynes.</i> <u>Target 2</u> <i>The amount of biodegradable household waste being landfilled by the Council will be reduced to: -75% of its 1995/6 level by 2010 -50% by 2013 -25% by 2020</i> b) The targets set in the 2002 strategy were based on the Council's statutory targets. In December 2004, it was announced that the statutory recycling and composting targets would be capped at 30%

Table 2.4.2 - Progress on Actions Planned in the Last Strategy

Actions planned in the last (2002) strategy	Actions taken	Results achieved
1. A return to weekly kerbside collection of dry recyclables	This took place in November 2002	Increase in recycling rate from 10.6% in 2001/2 to 18.2% in 2003/4
2. The introduction of a kerbside compostables collection service in 2003/4 with an increase in local composting capacity	A chargeable fortnightly garden waste collection service running from March-November each year was introduced in April 2003	Composting rate has risen from 2.4% in 2002/3 to 8.3% in 2004/5. This will bring the overall recycling /composting rate close to 30% by 2005/6 25,000 residents participated 2004/5
3. A continuation of existing waste minimisation initiatives – home composting, nappy waste reduction, together with “waste awareness” of the public.	Home composting promotion increased significantly in 2003/4 when the Council became a “WRAP” home composting pilot area. In 2004/5 the Council received a grant to employ a “Real Nappy Development Officer” and to offer a £30 “cashback” to parents using re-useable nappies	20,000 home compost bins were delivered 1997-2004, with a further 4,000 delivered to date in 2005/6. However, waste continues to grow. It is too early to see the results of the nappy grant since this only began in April 2005.
4. Funding would be sought to construct a fourth household waste site, near to the Kingston area, to be open by 2003, and containing a full range of recycling services.	While funding has been made available, difficulties in finding a suitable site have presented a significant barrier; no site is yet available	Provision for a site has been made in the Eastern Area Expansion, however this is not likely to be available in the immediate future. Improvements are being or have been made at the other three sites.
5. Efforts would be made to recover payment for hazardous waste brought to New Bradwell Household Waste Site by non Milton Keynes residents	This has not taken place	

Actions planned in the last (2002) strategy	Actions taken	Results achieved
6. That the bulky household goods collection service would include a chargeable appointments system and more furniture recovery; continued support, encouragement and expansion of the Age Concern Furniture Recycling operation	Chargeable appointments system in place, but furniture recovery has been limited by the difficulties of recovery of whole, clean furniture from houses. The Age Concern operation expanded in late 2004, in conjunction with other VOs and with the support of the Council	Take –up of the appointments system has been low, residents prefer to wait for a free collection. Furniture is now being diverted to those in need via the expanded furniture recycling operation.
7. All litter and dumped rubbish contracts would be placed into one contract with greater emphasis on education, enforcement and recycling. Where possible, those who have to repay a debt to society e.g. through community service, will take part in keeping Milton Keynes clean	Much of this has happened. The new Safer Communities Unit plays a significant role in enforcement against anti-social behaviour, and the new legislation will assist this.	Waste services officers are increasingly issuing fixed penalty notices and warnings where inappropriately placed refuse can be traced back to a property or resident. Leafleting of properties in areas where refuse is inappropriately placed also occurs.
8. Non -recyclable wastes would be bulked up and metals recovered from them at a transfer station by 2003	This has not occurred. Difficulties in finding suitable sites are a considerable barrier.	
9. The Council purchases recycled materials wherever possible	The Council purchases recycled paper, some recycled plastic street furniture, and recycled toner cartridges.	This is an ongoing action
10. The Council, in co-operation with other organisations promotes and facilitates waste reduction activities amongst local businesses	The Council has produced a waste reduction directory for businesses, available on the Council website at www.mkweb.co.uk/waste	This is a popular website, receiving one of the highest rates of “hits”.
11. Lobbying for strong, effective producer responsibility legislation	The Council takes opportunities to lobby wherever possible and where not constrained by resources.	The number of consultation documents received in recent years has been very large.

Actions planned in the last (2002) strategy	Actions taken	Results achieved
12. To place all waste disposal and collection contracts together into a single contract, ready for re-tendering for new contracts in 2007	This is currently taking place in order to facilitate tendering; the contract may be flexible regarding integration.	Tenders are expected to be invited in 2006.
13. To carry out a BPEO study to determine best methods for dealing with waste in the future, including the role of wheeled bins in the mix.	This has been undertaken as part of this strategy update	
14. In the longer term, after 2007/8 the new contracts would be guided by the zero waste principle, and the other principles laid out in Chapter 2.3	To be reviewed in this update.	

Chapter 2.5

Waste Growth and Waste Minimisation

Previous strategies have identified that waste continues to grow above the rate of population growth in Milton Keynes, but it is far from clear why. In the following tables past waste arisings for household and municipal waste have been re-analysed in an attempt to isolate some of the causes of growth.

Some causes of fluctuation in the data may be:

- In 2000/01 there was a change in the way in which data was reported to the Council. Around this time, coinciding with a change in contracts, data is poor and some of it had to be estimated. A step change occurred in growth at this time, and it isn't known whether this is due to a change in reporting or a genuine change in waste arisings. There was a particular change in mechanical sweepings data, due to a change in collection method since it was not then possible to drain off as much water from them prior to landfilling.
- That waste growth is related to affluence/ disposable income. Milton Keynes is a relatively affluent, and this may be one reason why waste continues to grow above population growth.
- That a decreasing number of persons per household results in less efficient use of resources per person (because there is less sharing of appliances etc).
- Weather influences waste arisings, with wet weather giving greater arisings because a) vegetation grows more and b) the collected materials are wet.
- The introduction of the kerbside garden waste collection scheme may have led to an overall increase in waste arisings (though this was introduced in a very dry year – 2003/4 – the effect would not have been seen till 2004/5).
- In 2000/1 and 2001/2 there was a drop in the amount of kerbside recyclables collected. This was due to a change in October 2000 from weekly to alternate week collections of recyclables. When a weekly system was re-introduced in November 2002, kerbside recyclable collections rose.

Waste growth that is above population growth is termed “social growth”. In Table 3 the average growth rates for population, household waste arisings, municipal waste arisings and the “social growth” elements of these are given. They have been split into the time periods before and after the 2000 step change (since data before this is felt to be less reliable), and for the whole period from 1992/3 to 2004/5. For the period that is thought to be more reliable i.e. since 2001/2, municipal waste growth per person averaged 1.8%

Table 2.5.1 - Household Waste Arisings, Tonnes

	Refuse round	Bulk skips	Bulky collections	Residual collections from CA sites	Recycling at CA sites	Garden waste at CA sites	Kerb-side Garden Waste Collections	Kerb-side recycling collections	Recycling from banks	Other recycling/composting	Litter	Incinerated items	Total household waste	Recycling/composting rate	Population (all ages, ONS)	Population growth, %	Household waste growth, %	"Social growth" %
1992/3	45,417	2,144	2,532	15,482	1,737			7,096	1,095	90	3,093		78,686	12	180,400			
1993/4	48,923	2,982	1,420	13,802	3,362			8,310	694	90	3,729		83,312	14	183,900	1.9	5.9	3.9
1994/5	50,796	4,178	955	13,907	2,889			9,182	517	92	3,179		85,695	14	187,900	2.2	2.9	0.7
1995/6	52,481	1,989	1,072	15,337	1,771			8,853	403	94	3,763		85,763	12	192,400	2.4	0.1	-2.3
1996/7	51,264	1,608	1,201	18,198	2,123			9,520	560	135	3,639		88,248	13	196,600	2.2	2.9	0.7
1997/8	50,090	1,500	1,699	20,593	1,970			10,163	1,049	126	4,013		91,203	14	199,700	1.6	3.3	1.8
1998/9	48,152	1,275	1,573	19,515	2,353			11,005	1,106	44	3,645		88,668	16	202,900	1.6	-2.8	-4.4
1999/0	49,107	1,382	1,657	20,641	1,888			11,289	1,186	57	3,724		90,931	15	206,700	1.9	2.6	0.7
2000/1	54,087	754	1,825	22,734	2,079			9,712	1,288	108	4,102		96,691	13	209,800	1.5	6.3	4.8
2001/2	62,739		1,577	24,506	2,515	2,610	74	7,810	1,295	305	4,367	52	107,848	13	212,710	1.4	11.5	10.2
2002/3	62,875		1,158	24,781	3,418	2,634	16	10,638	1,371	368	2,006	49	109,315	16	214,200	0.7	1.4	0.7
2003/4	55,486		2,512	21,956	3,723	3,081	3,214	15,279	1,109	449	1,745		108,554	24	215,700	0.7	-0.7	-1.4
2004/5	53,827		4,360	22,411	4,282	3,439	6,102	15,486	1,224	403	2,261	365	114,160	27	216,850	0.5	5.2	4.7

Notes:

- Refuse round includes refuse from schools, flats and non clinical waste from the hospital
- Bulk skips were discontinued in 2000
- Garden waste arisings from CA sites prior to 2001/2 included in recyclables from CA sites
- Recycling from banks fell in 1993/4 due to kerbside roll-out
- Other recycling/composting = textiles, foil, leaves
- Incinerated items = fridges or residuals from MRF
- It should also be noted that population figures in these table are higher than in previous strategies - they have recently been revised upwards by the Office of National Statistics.

Table 2.5.2 - Municipal Waste Arisings, Tonnes

	Household Waste Arisings	Mechanical Sweepings	Trade, flytipping & other residual arisings	Hardcore	Items for re-use	Total Municipal waste	Municipal Waste Growth %	Population	Population growth %	"Social" growth %	Annual total rainfall mm (Source: Milton Keynes Council Environmental Health)
1992/3	78,686	2,869	0	0	0	81,555		180,400			
1993/4	83,312	4,836	0	0	0	88,148	8.1	183,900	1.9	6.1	605.6
1994/5	85,695	4,348	0	0	0	90,043	2.1	187,900	2.2	0.0	635.4
1995/6	85,763	4,287	0	0	0	90,050	0.0	192,400	2.4	-2.4	587.4
1996/7	88,248	3,831	0	0	0	92,079	2.3	196,600	2.2	0.1	452.8
1997/8	91,203	3,825	0	0	0	95,028	3.2	199,700	1.6	1.6	520.0
1998/9	88,668	867	0	0	0	89,535	-5.8	202,900	1.6	-7.4	736.6
1999/0	90,931	894	0	0	0	91,825	2.6	206,700	1.9	0.7	no data
2000/1	96,691	985	0	0	65	97,740	6.4	209,800	1.5	4.9	869.8
2001/2	107,848	3,934	683	1,794	1,704	115,964	18.6	212,710	1.4	17.3	708.2
2002/3	109,315	5,480	695	1,446	1,630	118,565	2.2	214,200	0.7	1.5	772.6
2003/4	108,554	5,576	785	2,292	779	117,986	-0.5	215,700	0.7	-1.2	509.4
2004/5	114,160	5,197	1,818	2,361	1,150	124,685	5.7	216,850	0.5	5.2	527.8

Notes:

Trade, flytipping, and hardcore were not itemised separately from other streams until 2000/1

Table 2.5.3 - Average growth rates, household & municipal waste

%	Population	All Household waste	Household waste "Social growth"	All Municipal Waste	Municipal waste - "social growth"
Average 1992/93-2000/01	1.9	2.6	0.	2.4	0.5
Average 2001/02-2004/05	0.6	1.9	1.	2.5	1.8
Average over 1992/3-2004/5	1.5	3.2	1.	3.7	2.2

It is unlikely that Milton Keynes will see a decline in waste growth, given the increase in population expected.

Large reductions in waste arisings are only likely to be achieved locally if changes are made either to law, in national policy or in society itself. As a local authority the Council has limited influence on the major social and economic changes that are needed to effect a significant reduction in waste per capita.

Legal, policy or social changes that could result in less waste being produced include:

- Greater and more effective producer responsibility i.e. manufacturers and suppliers of goods and services taking a greater responsibility for the waste produced by those products and services
- Residents paying directly for the amount of waste they produce (so that waste collection would become a service like electricity or gas). This is known as “pay as you throw”. It could be sensitive (issues of fairness and increased fly-tipping or back-yard burning are often raised) and difficult to administer
- Taxes, bans and levies. An example is the plastic bag tax recently introduced in Ireland; in other parts of the world certain types of plastic bags have been banned.

However, the Council is currently engaged in two projects that aim to reduce waste at source. These are:

a) Home composting campaign

Since 1997, Milton Keynes residents have been able to obtain home composting bins from the Council at low prices. Until 2004 the main method of promotion was through the Council’s magazine, run two or three times each year. By the end of 2003 11,000 residents had taken advantage of this offer. The bins were £12, and had to be collected by the resident from Frosts Garden Centre in Woburn Sands. In addition a wildlife and composting demonstration garden was developed with Landfill Tax Credit Scheme funding at the Hanson Centre in Great Linford for residents to learn about home composting.

In 2004 the Council became a WRAP Home Composting Pilot Area. WRAP provided home composting bins for £5, delivered to the resident. They have also provided an extensive publicity campaign including radio and poster advertising, literature, a helpline and a local home composting advisor. In 2004, 9,000 bins were distributed under this campaign, almost half of them at a one-day sale.

In 2005 The WRAP campaign continues with a choice of two bins for the resident, at £5 and £10, each with a free kitchen caddy. WRAP have provided promotional support including a “one day sale”. By the end of October 2005 a further 4,000 bins have been placed in Milton Keynes.

In 2006, the promotion is expected to continue in a similar fashion, with a price increase to £6 on the lower priced bin. After 2007, the support from WRAP is likely to decrease.

WRAP have been carrying out analysis of data collected in Milton Keynes and other Councils and are expected to announce the contribution that home composting bins make to waste reduction shortly.

Recent section 106 agreements have also required developers to put home composting bins and water butts in new developments.

b) Nappy waste reduction campaign

This campaign has been running since 1999, with leaflets and promotions, for instance in “Real Nappy Week”, and a trial with Milton Keynes Hospital. These campaigns encouraged parents to use re-useable washable nappies that can either be laundered at home or by a local nappy washing service.

In 2005, the Council has received funding from WRAP until March 2006 to recruit a “Real Nappy Development Officer” and to run a £30 cashback incentive scheme for parents using washable nappies. It is hoped that 450 babies will be using washable nappies by 2006, diverting 137 tonnes of residual refuse annually.

Feedback from the Consultation

There is strong support for reducing waste growth from nearly all consultees and a desire for “more to be done”, probably on a national scale, to reduce waste arisings. Suggestions included lobbying government, and charging according to the amount of waste produced. 167 respondents to the short survey took the opportunity to comment that they thought taxes, fines, or penalties to encourage recycling, or mandatory recycling

It is thought particularly unfair that Milton Keynes should be penalised for being in a growth area and that landfill allowances do not take account of this.

56 respondents to the short survey took the opportunity to make comments on the nappy issue and made a range of suggestions on how to deal with the problem. Awareness of the nappy issue in Milton Keynes is relatively high at present due to the recent promotion, and the featuring of a local family on a television programme.

21 respondents commented that there should be more information or other assistance with home composting.

Chapter 2.6

Current Waste Collection Arrangements

1. Kerbside refuse, recycling and garden waste collections

Since October 2000, a kerbside refuse and recycling collection contract has been in place using “onepass” vehicles, which collect both refuse and recyclables at the same time using three separate compartments. The contract ends in 2007, and is held by Cory Environmental Ltd.

Collections are from the front property boundary.

Refuse is collected in a black sack. Dry recyclables (paper, cans and plastic bottles) are collected in pink sacks and glass in a blue box. Black sacks, pink sacks, and blue boxes are all now collected weekly (until November 2002 the recyclables were collected fortnightly using boxes). The refuse sacks and pink sacks go into separate compartments at the rear of the vehicle, and the glass is emptied into a pod at the front. Garden waste and bulky items are collected separately, and may not be put in the refuse sacks.

In some flats and sheltered housing wheeled bins are used instead of sacks for the collection of either or both refuse and recycling. Whether wheeled bins are used depends on local factors such as the layout and number of properties. In these cases, the onepass vehicle is unsuitable for collection as it has no bin lift. An ordinary refuse vehicle with binlift is used to collect the refuse, and the vehicle which empties the recycling banks is used to collect the recyclables.

Refuse is taken to landfill at Bletchley.

Recyclables are taken to the Recycling Factory in Wolverton.

There is also a twice-yearly kerbside collection of textiles for the Council by the Salvation Army. These are taken directly to their sorting factory in Wellingborough.

In 2003 the Council introduced a chargeable garden waste collection scheme, as planned in earlier strategies. Residents pay an annual charge to hire a green-wheeled bin from the Council and use a fortnightly collection service, which runs from March to November inclusive. It was decided that the service should be chargeable, fortnightly and not collect in the winter months in order to keep costs down. In 2003/4 the Council received funding from DEFRA for the purchase of three garden waste collection vehicles and a contribution towards the funding of the wheeled bins. The garden waste collected is taken to three local farms which

all have open-windrow composting processes. In the first year, 2003, 21,000 residents joined the scheme; this rose to 25,000 residents in 2004 giving a capture rate of 243kgs/year per property, which is higher than in some other kerbside garden waste schemes. This may be because the scheme is chargeable - it most likely to be used by those with the most garden waste. At the time of writing the number of participants in the garden waste scheme in 2005 is 27,300.

Table 2.6.1 - Kerbside Refuse and Recycling Collections – tonnages of materials collected

Year	Kerbside Onepass Refuse Tonnes	Kerbside Onepass Recycling Tonnes	Kerbside Garden Waste Collections Tonnes	Kerbside Textile Collections
2001/2	62,495	7,693	74	129
2002/3	62,496	10,683	16	156
2003/4	55,078	14,471	3,214	113
2004/5	53,471	15,851	6,102	94

It can be seen that kerbside refuse collections have been reduced by increasing recycling and garden collections. The Council's kerbside collections have recently been analysed separately from other kerbside collections at the recycling factory, and have been shown to have the following composition:

Table 2.6.2 - Breakdown of onepass recycling collections

Materials	%
Newspapers and Magazines	63.22
Mixed Paper	5.01
Glass	18.22
LDPE Plastic	4.39
PET Plastic	0.61
HDPE Plastic	0.69
Steel	0.92
Aluminium	0.02
Fines & oversize rubbish	6.92
Total	100.00

Using this breakdown together an audit of kerbside collections carried out in 2000¹⁰, plus the materials recovered from recycling banks, the recovery rates of the materials in the kerbside streams can be calculated as follows:

¹⁰ Household Waste Composition Study. April and November 2000
www.mkweb.co.uk/waste

Table 2.6.3 - Recovery Rates of Materials collected by kerbside recycling / composting

Materials	% Recovery
News & Pams	58.7
Mixed Paper	16.9
Glass	46.5
PET	17.5
HDPE	13.1
Steel	10.6
Aluminium	1.0
Garden Waste	97.5
Textiles	10.5

It can be seen that more than half the newspapers and magazines and nearly half of the glass are being recovered. However, the recovery of plastic, cans and textiles could be improved. The very high recovery of garden waste suggests that garden waste is being diverted from the CA sites, or could be new materials that were not entering the municipal waste stream before.

The audit of kerbside materials carried out in 2000 indicated that the materials currently collected comprise 55.8% of the total kerbside collected materials. Another 15.6% could be composted at home, and disposable nappies that could be replaced by washable nappies form another 1.64%. A further 0.15% is reusable bric-a-brac that could be given to charity shops. The largest biodegradable part of the waste not yet being collected is food waste, which forms 22.65% of kerbside collections (though much of this could be home composted).

Participation in the onepass kerbside recycling scheme is not routinely measured at present. However, a canvassing exercise was carried out in Milton Keynes in 2003, and participation was measured as part of this exercise. This measured set-out rates in the scheme over a four week period before and after canvassing in two estates believed to be reasonably representative of Milton Keynes as a whole - Emerson Valley and Two Mile Ash, and one area where participation was believed to be low – Netherfield. Two Mile Ash acted as a control area and received no canvassing.

The results were as shown below:

Table 2.6.4 - Participation and the effects of Canvassing - 2003

Area	Participation rate %	
	Mar-03 Before Canvassing	Sep-03 After Canvassing
Netherfield	34.49	41.49
Emerson Valley	52.92	57.71
Two Mile Ash (not canvassed)	63.89	57.77

It can be seen that the in the areas thought to be “average”, over half the households were participating in the scheme, whereas in the area thought to have

low participation, only a third of households were participating before canvassing. However, canvassing appeared to have the greatest effect here, raising participation to 41.5%. In the control area, where no promotion was carried out, participation actually fell 6% over the period.

Analysis of the ratio of recyclables to refuse collected by round indicates that there is a strong socio-economic element to recovery by the kerbside recycling. Rural areas tend to have higher recovery than urban areas. Within urban areas, poorer areas tend to have lower recovery rates. Some newer areas (e.g. Monkston) also have low recovery rates.

Food Waste Trial

In September 2005 Milton Keynes Council began collecting food waste at the kerbside in two trial areas – Newport Pagnell and Bradwell Common, each of 500 homes. The purpose of the trial is to ascertain the participation rate and tonnage that might be diverted from landfill if food waste collections were to be made across the borough.

Since food waste is the main area of biodegradable waste that is not being diverted from landfill at the moment, it is potentially an important means by which the Council may move towards meeting its landfill allowances. If the trial is successful, it is hoped to roll it out to the whole borough in 2007/8.

In both areas the residents have been given small (7 litre) bins for the collection of food waste in their kitchen.

In Newport Pagnell, residents have also received a 25 litre lockable bin for the storage of food waste outside.

In Bradwell Common, residents have been removed from the current garden waste scheme and have been given 140 litre wheeled bins for the collection of garden and food waste together. Thus they are getting a free garden collection year round, as well as a food waste collection.

At the time of writing, the trial is still at a very early stage.

Feedback from Consultation

During the consultation process it appeared that several issues regarding current kerbside collection practices were arising from the comments received. These were:

- *There was an overall preference that Milton Keynes should remain with refuse sacks for collection of residual waste (53.5% of respondents). This is strongest amongst those in terraced housing or bungalows and amongst the older population. There is however, a vocal minority of around one third of the short survey respondents who would prefer wheeled bins and 155 respondents wrote comments in support of this.*

- *There remains a preference for plastic sacks for paper, cans and plastic collections, a box for glass collections, and a wheeled bin for garden waste collections (as now).*
- *There is a strong wish to recycle or compost more materials such as drinks cartons, food waste or plastics not recyclable at present – 218 commented on this – the highest number of comments.*
- *Some (62) complained of difficulties in obtaining sufficient pink sacks for recycling, or generally not being enough sacks for either refuse or recycling.*
- *A small number (7) commented that they had problems in obtaining blue boxes and 13 commented on problems in getting the box back after collection.*
- *52 respondents commented that either garden waste bins or home composters should be free.*

In the short survey, residents asked whether they would be prepared to separate out all their food waste for composting by putting it out for weekly collection in a lockable bin. 73% of respondents replied that they would be prepared to do this.

2. Recycling Banks

In addition to the kerbside dry recycles collection service, the Council also has ten recycling “bring” or “bank” sites as shown below. The three CA sites also act as bring sites, but will be dealt with in the following section. As with the refuse and recycling contract, this collection contract is with Cory Environmental. It began in October 2000 and will last till 2007.

Table 2.6.5 - List of Bring Sites and Materials Accepted

Area	Place	Glass	Cans	Plastic bottles	Paper	Textiles	Aluminium foil
Bletchley	Tesco, Watling Street	Yes	Yes	Yes	Yes	Yes	Yes
Bletchley	Duncombe Street car park	Yes	Yes	Yes	Yes	Yes	
Central Milton Keynes	Church of Christ the Cornerstone car park	Yes	Yes	Yes	Yes	Yes	
Central Milton Keynes	Car park near Iceland, Avebury Boulevard	Yes	Yes	Yes	Yes	Yes	
Emerson Valley	Car park near The Clock Tower pub, White Horse Drive	Yes	Yes	Yes	Yes	Yes	Yes
Fenny Stratford	Denmark Street car park	Yes	Yes	Yes	Yes		
Kingston	Kingston Centre	Yes	Yes	Yes	Yes	Yes	Yes
Stoke Goldington	The Lamb car park High Street	Yes					
Stony Stratford	Vicarage Road car park	Yes	Yes	Yes	Yes	Yes	
Wolverton	Tesco, Stratford Rd	Yes	Yes	Yes	Yes	Yes	Yes

All the sites have 1280 litre wheeled “eurobins” in lockable corrals for glass, paper, and mixed cans and plastic bottles (apart from the Lamb in Stoke Goldington which only has glass banks). On the most heavily used sites there are also Salvation Army textile banks and aluminium foil banks that are serviced by Milton Keynes Christian Foundation.

The glass, paper and cans and plastics banks are all serviced at least once a week by a three-compartment vehicle that takes the materials to the recycling factory in Wolverton. Heavily used sites are serviced more often. The textile banks are also serviced weekly, and the aluminium foil banks are serviced according to usage.

The banks vehicle also collects materials from other sources:

- Schools, which have wheelie bins for paper and mixed cans and plastics. Nearly all the schools in Milton Keynes now participate in recycling paper. Some also recycle cans and plastics and attempts are being made to increase this to all schools;
- Some sheltered housing, flats and other large domestic properties which are unsuitable for kerbside collections;
- There are also 1280 litre “eurobin” banks at Civic Amenity sites for glass, cans and plastics that are emptied at least once a week by this vehicle.

There are other banks, particularly for textiles, which are placed in Milton Keynes under private arrangements. The Council regularly receive tonnage reports from two organisations known to have placed banks under private arrangements – Oxfam (textile banks) and European Recycling Company (shoe banks). However, there are also other collections of recyclable materials that have no connections to the Council recycling operations in any form. Examples of these would be carrier bag banks operated by Tesco and Safeway, and a textile collection scheme operated by Planet Aid.

There have been some difficulties in placing public recycling banks. Complaints from residents or landowners about nuisance resulting from the site (e.g. noise, traffic) have resulted in banks being removed from some areas. It can be difficult to find new sites. However, due to the existence of the kerbside scheme it is not necessary to place many banks in Milton Keynes – only those at supermarkets are heavily used. Fly-tipping and littering at recycling bank sites can be a problem. Clearance of fly-tipped waste is very expensive and it sometimes prevents vehicles from servicing the banks.

Table 2.6.6 - Tonnes of Materials Collected at Bring Sites

Tonnes	Glass	Paper	Cans & Plastics	Textiles	Alum-inium foil	Total
2001/2	692	546	57	119	1	1,415
2002/3	706	589	75	140	1	1,511
2003/4	536	474	53	122	1	1,186
2004/5	613	556	55	142	1	1,367

Notes: “textiles” includes not just Salvation Army banks but also Oxfam and European Recycling Company banks, which have their own sites. Bank collections were reduced with the introduction of weekly recycling in November 2002.

Feedback from the Consultation

A few respondents made comments that there were not enough bank sites

3. Civic Amenity Sites

Civic Amenity "CA" sites or "Community Recycling Centres" as they are currently known in Milton Keynes are collection points for household waste which must be provided by a Waste Disposal Authority. In Milton Keynes there are three sites at:

- Chesney Wold, Bleak Hall
- Newport Road, New Bradwell
- North Crawley Road, Newport Pagnell.

The previous strategy identified the need for a fourth household waste site to cope with the growing population of Milton Keynes. There are no CA sites in the south/south east of Milton Keynes. The Council is still trying to find a suitable site for its location.

The sites are operated by WRG under a contract, which will last till 2007. All the sites have recycling facilities for glass, mixed cans and plastic bottles, paper, corrugated cardboard, engine oil, car batteries, scrap metal, rubble/hardcore, and green garden waste. In addition, the contractor is encouraged to recover as much material from the waste stream as possible. Thus, operators recover a wide range of furniture, rags, bric-a-brac and household items for sale either to traders or to the general public. To encourage sales of recovered items, a covered selling area known as the "STAR" (Second Time Around) shop has been constructed at the New Bradwell site for sales to the public.

All three sites accept trade waste at a charge.

New Bradwell site is licensed to accept certain hazardous wastes, including asbestos, and has separate containers for these.

Issues

- All three CA sites require investment - to improve safety, security, and efficiency. Newport Pagnell site is particularly small. Bleak Hall site does not have a raised delivery area, as the other two sites do, so residents must walk up steps to place items in skips. However, at the time of writing work is underway to make improvements to all three sites.
- All three sites are heavily used, and at peak times queues build up on the approach roads.
- New Bradwell is the only site for the depositing of asbestos for a considerable distance. None of the surrounding local authorities have facilities for asbestos. It is therefore likely that asbestos waste is travelling a considerable distance to the site, from outside Milton Keynes.
- It is known that residents from outside the Milton Keynes area use all three sites. In particular Newport Pagnell site is believed to be used by residents from Bedfordshire and Bleak Hall by residents of Buckinghamshire. Northamptonshire residents are known to use New Bradwell. Some

neighbouring local authorities have introduced permit systems or height barriers at their CA sites to discourage trade waste.

- The disguising of trade waste to avoid charges is likely to be taking place on all sites, and can be a cause of confrontation between operators and those depositing waste at the site. It can be difficult to identify trade waste.

Table 2.6.7 - Recovery of Materials at CA sites 2004/5

Material	Tonnes
GREEN WASTE	3438
HARDCORE	2419
CARDBOARD	333
NEWSPAPERS & MAGAZINES	226
RE-USE	1007
WOOD	707
BATTERIES	101
SCRAP	2880
OIL	35
TEXTILES	4
TOTAL RECOVERED	11150
CA SITE RESIDUALS	22411
TOTAL	33561
% RECOVERY	33.2

In 2005, the recovery rate at CA sites has improved considerably and it is hoped that by the end of the year it will be nearer 50%. There are various reasons for this:

The sites have recently seen some improvements. New signage funded by WRAP makes it clearer which containers are for recycling. Further funding from WRAP has enabled the installation of a dedicated “fast track” area for garden waste at New Bradwell and extra skips at the other sites., which has assisted the recovery of garden waste. In addition an incentive scheme has been introduced to reward contractors for recycling.

With the implementation of the WEEE Directive expected in 2006, it is hoped to place separate containers for WEEE on those sites large enough to accept them. However, the Council awaits guidance on the numbers and types of containers required, and also requires further clarification on funding arrangements by compliance schemes.

Feedback from the consultation

Although CA sites were not the main focus of the consultation, 71 respondents commented on the need for improvements at CA sites, particularly covering issues of queuing, signage, and layout. It is hoped that many of these issues will be addressed in the works that have recently been carried out.

4. Litter, street cleansing, dumped rubbish, and flytipping

A new contract for collection of litter and street cleansing began in October 2000. It will end in 2007, and is currently held by Cory Environmental.

“Cleansing” includes removal not just of litter, but also emptying of litterbins, the removal of dog-fouling, and large dumped items of rubbish.

Areas are cleaned at different frequencies depending on the area and the amount of litter generated. Generally shopping areas, particularly those with high usage are cleaned more frequently than residential or rural areas.

Mechanical sweepers are also used to clean mud from roads under highways legislation; some of this is recharged to businesses that generate large amounts of mud e.g. building sites.

Excessive gross cleaning or litter problems are dealt with on an emergency responsive basis, e.g.: broken glass, excessive dog fouling, and hazardous waste.

Note that the Council is only responsible for cleansing those parts of the city for which it is responsible. In particular it should be noted that many parks are the responsibility of Milton Keynes Parks Trust, and that some open areas are under the control of English Partnerships, shopping centre management companies, the Highways Agency, rail companies and other private and public bodies. However, the Council does have the power to designate “litter control areas” and issue “litter abatement notices” to landowners who have not cleared up their land.

The new cross-agency “Safer Communities Unit” employs officers who handle a range of anti-social behaviour including fly tipping and littering. This includes street wardens who are located in some of the areas where there are particular problems with anti-social behaviour. They are able to carry out educational work and create a close liaison between the council and the local community.

A new best value performance indicator measures the cleanliness of those parts of Milton Keynes, which the Council is responsible for cleaning. A representative sample of streets must be scored for litter and detritus each year. This is combined to give an overall score 72.2% of streets met cleanliness standards A or B (the highest two scores of cleanliness) in 2004/5.

In the autumn, a significant proportion of the litter collected is often leaves. For the first time in autumn 2004, some trial loads of leaves from street cleaning were sent to an on-farm composting plant used by the kerbside collections. The trial was successful and diverted 17 tonnes of leaves to composting. This was extended in the autumn of 2005.

Issues

- The Council budget for street cleaning has been the subject of recent cuts, whilst the growth of Milton Keynes streets continues. Hence, it is difficult to

include the large number of newly adopted roads in the current street cleaning schedules.

- In general, there are probably not enough litter bins; in areas where the schedule does not specify a frequent cleanse placing litter bins may actually cause litter problems since they need to be regularly emptied. The main expense associated with placing a litterbin is not with the bin itself but with the cost of servicing it.
- In addition, the growth of fast food outlets has contributed to a growth in the amount of litter. The Council does have some legal powers to control litter from fast food outlets. A growing part of the litter problem is litter thrown from cars.
- Collecting waste as litter, dumped rubbish or fly tipping is the most expensive method of collection.
- Much of the fly tipping is trade rather than household waste. It is likely that increasing costs of proper collection and disposal of waste due to factors such as legislation and increasing landfill tax are encouraging some of the fly tipping.

Feedback from the Consultation

63 respondents took the opportunity to comment that more should be done to discourage fly tipping and litter.

Comments around this subject are often in relation to specific areas, where there may also be poor recycling rates, and other social issues.

5. Hospital Waste

The Council collects non-clinical waste from Milton Keynes Hospital in compactor skips. This is taken directly to landfill. The waste audit carried out in 2000 showed that there is a great potential for recycling of this material. In particular, 62% of the waste is paper and cardboard. Whilst 17% is non-recyclable (this mostly being paper hand towels), the remainder is suitable for recycling.

Apart from the need to set up more recycling facilities at the hospital, there are no other major issues with the waste stream from the hospital.

6. Clinical Waste from Homes

The Council collects clinical waste from those receiving medical treatment at home. This is run in partnership with the local NHS Trust, who notify the Council of those requiring the service. The service is contracted out to Cory Environmental Ltd to 2007, as part of the main refuse and recycling contract. Special yellow sacks (the recognised colour for clinical waste) are given to each resident requiring collection, and the contractor provides the necessary trained personnel and sealed collection vehicle. The waste is taken to Milton Keynes Hospital who arrange for the waste to be disposed of at a clinical waste incinerator.

7. Bulky Collection Service

The Council provides a free collection service for bulky household items. Only residents wishing to book a specific appointment for collection are asked to pay a small charge. However, some residents request the pick up of trade items, and a charge is made for these of £35 per pick-up. As a general guideline, moveable items that you would normally take with you when you move house e.g. sofas, fridges, etc are household waste. Those that you would normally leave behind e.g. fences or kitchen and bathroom suites are trade waste. Many local authorities charge residents for such a service, whether it is trade or household. It can, however, be argued that by providing a free service, fly tipping and dumping of rubbish is discouraged. Bulky items are picked up within 1-10 days of a call to the Helpline being taken, from an agreed point outside the property.

Council publicity encourages residents who have items in good condition to call the Age Concern Furniture Recycling operation at Kiln Farm first, in order that such items can be diverted to re-use wherever possible. However, it should be noted that Age Concern cannot take some items, especially upholstered items that do not meet fire regulations, and items that do not comply with Trading Standards or safety legislation.

Issues

More furniture could possibly be diverted to re-use if:

- Residents did not break it up before calling the helpdesk, and kept it in good condition
- Items were not left outside for 10 days before collection
- Age Concern (or another suitable body) were able to screen all the helpdesk calls for suitable items for re-use
- The disposal of fridges collected by the service has been more expensive since January 2002, due to Ozone Depleting Substances Regulations, and also since they became "hazardous waste". This issue is also affecting the desirability of charities such as Age Concern to handle TV's and monitors, which are similarly affected. However, with the introduction of collections under the WEEE Directive in 2006, it is hoped that this issue will be removed.

Chapter 2.7

Current Waste Disposal Arrangements

The Council uses a number of waste disposal sites. All are local, and most vehicle movements are within the Borough.

The disposal sites currently used are as follows:

Materials Recycling Facility, “MRF” at Colts Holm Road, Old Wolverton

This facility is owned by the Council and operated by Cutts Brothers (Doncaster) Ltd until 2007. The facility was built in 1992/3 to handle dry recyclables only with a capacity of 32,000 per annum. However in April 2005 a major fire occurred at the facility. As a result materials are temporarily being transferred to MRFs at Peterborough and Doncaster. Rebuilding work has commenced and is expected to be finished by March 2006

Composting Facilities

The Council uses three local farms to compost garden waste from kerbside collections and Community Recycling Centres. Each contract lasts till 2007. The composted material is used on-farm as agricultural fertiliser.

Materials collected on the food waste which began in September 2005, are taken to an animal-byproducts compliant plant at High Wycombe. At the time of writing it is believed that there are no operational abpr-compliant plants closer than this, though it is hoped that some may come on stream in the near future.

Landfill sites

The Council uses three local landfills for the disposal of wastes, under a contract with WRG till 2007. Most of this is received at Bletchley landfill. Small amounts of Council waste are also received at Brogborough and Stewartby landfills. Stewartby landfill accepts hazardous waste for treatment, though this is unlikely to continue in the longer term. Occasionally small amounts of municipal waste are taken to Northampton transfer station, also operated by WRG.

Site availability

As will be discussed more fully in the WDPD, there is a shortage of suitable sites currently available for waste management in Milton Keynes. There is a small area of nearly 1ha owned by Milton Keynes Council next to the MRF site, which may be suitable for development.

Feedback from the Consultation

Criteria for future site selection are discussed more fully in the WDPD. Support is strongest for future waste management sites to be on existing landfill or other waste management sites, and on contaminated or derelict land. Many respondents took the opportunity to comment that sites should be away from built up areas.

Chapter 2.8

Education, Publicity and Enforcement

A zero waste strategy requires a high degree of education and enforcement at all levels.

The Council employs a full-time Education Officer to educate and inform all sectors of the population, especially schoolchildren, about the need for waste minimisation, recycling and composting. The Education Officer also takes part in litter education work.

In addition a wildlife and composting demonstration garden has been established at the Hanson Centre in Great Linford.

Both the education room and the demonstration garden have benefited from Landfill Tax Credit Scheme funding. This has also been a source of funding for coach trips for schoolchildren to visit the MRF.

WRAP has also funded handbooks for new residents, advertising on vehicles and other promotional work.

However, at the time of writing no further external sources of funding for educational are apparent.

The Education Officer works with other members of the Waste and Energy Resources department to further waste education and attends events and exhibitions as appropriate with other members of staff.

In addition, the Council has a monthly magazine in which the department runs regular articles about recycling, composting and other aspects of waste management.

The Council also takes part in and supports national waste reduction initiatives such as the National Waste Awareness Initiative, Composting Awareness Week, Real Nappy week etc.

With regard to enforcement, the Council is increasing the amount of resources dedicated to this area, with new Enforcement Officers working with both the Police and the Environment Agency to reduce littering and fly tipping in Milton Keynes. Fixed penalty tickets for littering are issued. The Enforcement Officers are now part of the new cross-agency "Safer Communities Unit" which is tackling many forms of anti-social behaviour in Milton Keynes.

In 2003 the Council carried out a large scale canvassing exercise covering 66,000 properties in Milton Keynes. Canvassers knocked on doors and talked

to residents about the various recycling and waste reduction activities in Milton Keynes. As a result, participation rose; see Table 2.6.4.

Feedback from the consultation

168 respondents from the short survey took the opportunity to comment on the need for more education and publicity.

The strong desire for more educational work, covering a range of waste management topics, was evident across all methods of public engagement.

Apart from recycling, respondents to the short survey and the CAGOW also made comments that they would like more information about the safety of incineration and that the Council should be doing more to inform residents on this topic.

Chapter 2.9

Best Value Performance Indicators

Waste Management in Milton Keynes is measured by a number of performance indicators set by the Government. Those that are relevant to this strategy are as set out in Table 2.8.1.

Note: there is a statutory recycling /composting target set for 82a and 82b added together. This was set at 33% for 2003/4 and 36% for 2005/6, but in late 2004 the target for 2005/6 was capped by DEFRA at 30%. As noted earlier, consultation is currently taking place

It can be seen that the Council improved the percentage of household waste recycled (BVPI 82a) considerably in 2003/4; this was due to the change to weekly recycling in late 2002. However, in 2004/5 this has levelled off, and it is likely that improved publicity/education is required to increase this further. However, the Council is in the top quartile of Councils for this performance indicator.

With the introduction of garden waste collections in 2003, the percentage of household waste composted has also improved, and the Council is now in the 2nd best quartile for this indicator, and also in the 2nd best quartile for % of household waste landfilled.

Regarding costs, the Council was in the worst quartile in 2003/4 for collection costs per household; this was due to extraordinary costs in that year relating to unexpectedly having to re-tender the MRF contract; it was, however in the best quartile for disposal costs, largely relating to the local availability of landfill.

Although some of the satisfaction indicators appear to have dropped in 2003/4, this may be due to the method of collection of the statistics, which changed from a face-to-face interview to a postal questionnaire.

BVPI 199, the new cleanliness indicator was collected for the first time in 2004/5.

Table 2.9.1 - Best Value Performance Indicators

Best Value Performance Indicator Number	Description	2001/2	2002/3	2003/4	2004/5	Quartile Ranking based on 2003/04	Best Actual figure 2003/4	All England Median 2003/4	Worst Actual figure 2003/4
BV82a	Household waste - percentage recycled	10.6	13.93	18.2	18.1	4	32.20%	13.00%	3.80%
BV82b	Household waste - percentage composted	2.5	2.42	5.8	8.4	3	26.56%	2.70%	0.00%
BV82c	Household waste - percentage of energy recovered	nil	nil	nil	0.3	1	0.00%	Nil	79.81%
BV82d	Household waste - percentage landfilled	86.8	83.6	76	73.2	3	8.35%	79.90%	94.91%
BV84	Kg of household waste collected per head	504	527	516	529.2	3	281 kg	430 kg	659 kg
BV86	Cost of waste collection per household	£40.65	£43.16	£57.68	£58.27	1	£0.00	£37.05	£149.07
BV87	Cost of waste disposal per tonne for municipal waste	£28.32	£28.58	£29.04	£28.99	4	£0.00	£39.84	£71.37
BV89	% of people very or fairly satisfied with cleanliness standards in their area		54%	54%	Not measured in 2004/5	1	84%	61%	32%
BV90a	% of people very or fairly satisfied with recycling facilities		72%	78%	83% <i>see note</i>	1	97%	86%	525
BV90b	% of people very or fairly satisfied with household waste collection		77%	72%	84% <i>see note</i>	3	87%	70%	22%
BV90c	% of people very or fairly satisfied with Civic Amenity Sites		87%	76%	82% <i>see note</i>	2	95%	78%	30%

Table 2.9.1 - Best Value Performance Indicators continued

BV91	% of pop. served by kerbside collection or within 1km of recycling centre (re-defined in 2003/4)	100	100	100	100	4	100.0%	95.0%	8.0%
BVPI 199	% of relevant land assessed as having combined deposits of litter and detritus across 4 categories of clean, light, significant and heavy	not collected	not collected	not collected	27.3	1	75.0%	20.6%	0.0%

Note regarding BVPI's 90a-c in 2004/5: the figures given in 2004/5 are not official best value performance indicators. They are from a similar household survey carried out in 2005. Satisfaction BVPI's are only carried out once every three years and were not carried out in 2004/5.

Feedback from the Consultation

72 respondents in the short survey took the opportunity to comment that they felt Milton Keynes set a good example or was in the lead in relation to recycling and that it should try to retain its lead and be better than the average. There was also a strong desire (160 comments) that the Council should do more recycling and waste minimisation generally.

108 respondents made comments about the Council learning from other Councils or countries, and many gave specific examples e.g. Germany, Daventry etc.

Section 3 - WHERE DO WE NEED TO GET TO?

Chapter 3.1

The Landfill Allowance Trading Scheme

The Landfill Allowance Trading Scheme began in April 2005 for the first time, places limits on the amount of biodegradable municipal waste that can be landfilled in the UK.

The Scheme has been brought in as part of the implementation of the Landfill Directive, which limits the amount of biodegradable municipal waste (BMW) that the UK can landfill. The objective of this is to reduce emissions of methane from landfills. Methane is a powerful greenhouse gas, contributing to global warming and climate change.

The limits for the UK are as follows:

- By 2010 the UK must landfill 75% of the BMW that it landfilled in 1995
- By 2013 the UK must landfill 50% of the BMW that it landfilled in 1995
- By 2020 the UK must landfill 35% of the BMW that it landfilled in 1995.

This is a considerable challenge given that municipal waste, in the UK as in Milton Keynes has been growing at around 3% per year.

Following the Waste and Emissions Trading Act 2003, all waste disposal authorities in the UK have been given allowances for the amount of BMW they can landfill, in order for the UK to meet its targets. If the UK fails to reach these, it could receive fines amounting to £0.5m per day that it exceeds them. The Government is therefore passing these fines down to waste disposal authorities that exceed their allowances in the target years. In addition, if a local authority exceeds its allowances in **any** year it will be subject to a fine of £150/tonne for every tonne that it has exceeded its allowance.

Waste disposal authorities may:

- Trade allowances with each other – i.e. a waste disposal authority with excess allowances may sell them to one that is likely to exceed its allowances. There is no ceiling or floor on prices of allowances, though the £150/tonne fine effectively puts a ceiling on the price.
- Borrow up to 5% of their allowances from the following year's allocation. A waste disposal authority may wish to do this if, for instance, it is bringing a new facility on-stream in the following year which will significantly reduce BMW going to landfill.

- Bank excess allowances and use them in following years.

The definition of municipal waste is likely to include not only household waste (as per BVPI 82a-d), but also fly-tipped waste, trade waste collected by a local authority, items that are collected for re-use such as furniture and bric-a-brac from CA sites and textiles, and hardcore/rubble. It does not include home composting.

The biodegradability of municipal waste is considered as follows:

Table 3.1.1 - Biodegradability of municipal waste components

Category of waste	% that is biodegradable
Paper/card (including Newspapers, Cartons, Card packaging)	100
Putrescible (including Food and garden waste)	100
Textiles	50
Fines	60
Miscellaneous Combustibles (e.g. disposable nappies)	50
Miscellaneous Non- Combustibles	50
Other (ferrous Non-ferrous Metal, Glass, Plastic)	0

DEFRA and the Environment Agency have carried out studies and consider the biodegradable portion of municipal waste to be **68%**. Using the figures shown above, the composition of municipal waste in Milton Keynes is very close to this at 67.7%.

The monitoring of the scheme will be the responsibility of the Environment Agency who will collect the relevant data from local authorities and landfill operators, and keep a register of trading, banking and borrowing.

Allowances will be based on the amount of total municipal waste that waste disposal authorities generated in 2001/2, and their contribution to overall municipal waste arisings in that year. This means that those waste disposal authorities which have significantly reduced their biodegradable municipal waste being landfilled – most notably those with incinerators – will have excess allowances to trade.

It should be noted that the amount of BMW being landfilled will be based on a “mass balance” approach. This means that the total amount of municipal waste generated by a waste disposal authority will be assumed to have 68% biodegradable content. The amounts of paper/card, putrescibles and other biodegradables diverted to recycling, composting, incineration and other treatments will be deducted from the total to give the total amount of biodegradable municipal waste going to landfill. The estimated diversion for 2004/5 for the Council is shown in Table 3.1.2:

Table 3.1.2 - Mass Balance for Milton Keynes Council in 2004/5

	Tonnes
Total MSW	124,685
BMW at 68%	84,786
<i>less:</i>	
Kerbside garden waste sent for composting(100%)	6,102
ca garden waste sent for composting (100%)	3,439
textiles from kerbside & banks(50%)	120
Kerbside paper collections recycled(100%)	10,816
banks paper recycled(100%)	556
ca site paper sent for recycling(100%)	226
ca site cardboard sent for recycling(100%)	333
ca site wood recovery (100%)	707
street cleaning of leaves sent for composting(100%)	17
Residuals from MRF sent for fibre fuel (68%)	248
Total BMW diverted	22,565
% diverted	26.6

Table 3.1.3 and Chart 3.1.1 show the situation if the Council makes no change to its present activities. It can be seen that the Council must not be complacent. Due to an increasing population and the amount of waste generated per head of population also increasing (though it has been assumed that this will decrease over time), the overall amount of BMW increases while landfill allowances decrease. If the Council makes no change to its current diversion of BMW from landfill, estimated at 26.9 in 2004/5, it is likely to have a small margin of excess allowances for 2005/6 at 2,165 tonnes. If 2005/6 turns out to be a year with exceptionally high growth of msw, e.g. due to high rainfall, it is possible that the Council could even incur fines this year. Even if growth is as predicted, it is almost certainly in a position where it will incur fines in 2006/7. By 2020 it could be incurring fines of over £11million per year. The fines could be greater than those shown in 2010, 2013 and 2020 if the UK incurs a fine as a result of missing Landfill Directive targets.

Even if were possible for the Council to recycle or compost 100% of all possible biodegradable material – i.e. paper, putrescibles, wood and textiles (e.g. assuming that all residents participated in separate collection schemes and 100% accurately separated their recyclables), it would still exceed its landfill allowances by 2018 – see chart 3.1.2

Options for avoiding fines include:

- Purchasing allowances from other waste disposal authorities which have excess.
- Increasing separate collections of kitchen and garden waste and composting or anaerobically digesting it.
- Sending some or all of the residual waste to an incinerator, or other thermal treatment plant which produces no biodegradable municipal waste for landfill, though this could be contrary to current Council policy.
- Using forms of mechanical biological treatment to reduce the amount of residuals being landfilled (longer term only).

These options require evaluation. The decision as to whether to purchase allowances or take some other action depends at least in part on the price of allowances. The fine level of £150/tonne effectively puts a “ceiling” on the value of allowances. Table 3.1.2 shows the amount that the Council would have to pay for its landfill allowances at different price levels. If the price level were low enough, it may be better to purchase allowances and landfill the materials. However, the cost of landfill must also be taken into account, and in particular the cost of landfill tax, which is likely to rise at £3/year until 2010. The Council’s landfill contract ends in 2007, and it is not known what the price of landfill will be after this date. The market for allowances is very new – only starting on 1st April 2005 – thus has little history. However, at the time of writing, allowances in the first half of 2005/6 had been trading at around £20/tonne for the current year and next two years.

The Council has recently been consulting with officers in both DEFRA and DTI regarding the particular difficulties that the Council faces in relation to growth. It is hoped that special circumstances of both Milton Keynes Council and other local authorities in growth areas may be considered in the future; however, at the time of writing, no allowances for growth have been given.

Feedback from the Consultation

The Consultation was the first time that many residents became aware of the issue of landfill allowances and some were shocked at the implications for Milton Keynes Council.

There was some resentment that no allowance had been made for growth.

Table 3.1.3 - Milton Keynes Council's LATS position

year	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
population (projected)	219,240	224,300	230,640	237,580	244,410	250,060	255,760	259,690	263,710	267,800	272,050	276,180	280,400	284,670	289,090
assumed "social growth" rate%	1.5	1.5	1.5	1.5	1.5	1.5	1	1	1	1	0.5	0.5	0.5	0.5	0.5
estimated total msw arisings, tonnes	127,950	132,867	138,672	144,987	151,393	157,216	162,407	166,552	170,821	175,206	178,876	182,499	186,214	189,995	193,910
BMW @ 68%, tonnes	87,006	90,349	94,297	98,591	102,947	106,907	110,437	113,255	116,159	119,140	121,636	124,100	126,626	129,197	131,859
current diversion of BMW: 26.6%, tonnes	23,144	24,033	25,083	26,225	27,384	28,437	29,376	30,126	30,898	31,691	32,355	33,010	33,682	34,366	35,074
BMW: landfilled, tonnes	63,863	66,317	69,214	72,366	75,563	78,470	81,061	83,129	85,260	87,449	89,281	91,089	92,943	94,831	96,784
landfill allowances for bmw, tonnes	66,028	62,482	57,755	51,845	44,753	39,772	34,790	29,809	28,530	27,252	25,973	24,694	23,416	22,137	20,858
Difference, tonnes	2,165	-3,835	-11,459	-20,521	-30,810	-38,698	-46,271	-53,320	-56,730	-60,197	-63,308	-66,395	-69,527	-72,694	-75,926
balance assuming banking, no borrowing, tonnes	2,165	-1,669	-11,459	-20,521	-30,810	-38,698	-46,271	-53,320	-56,730	-60,197	-63,308	-66,395	-69,527	-72,694	-75,926
Fine, £k	0	250	1,719	3,078	4,622	5,805	6,941	7,998	8,510	9,029	9,496	9,959	10,429	10,904	11,389

Chart 3.1.1 Landfill Allowances - Situation Assuming No Change to Current Activities

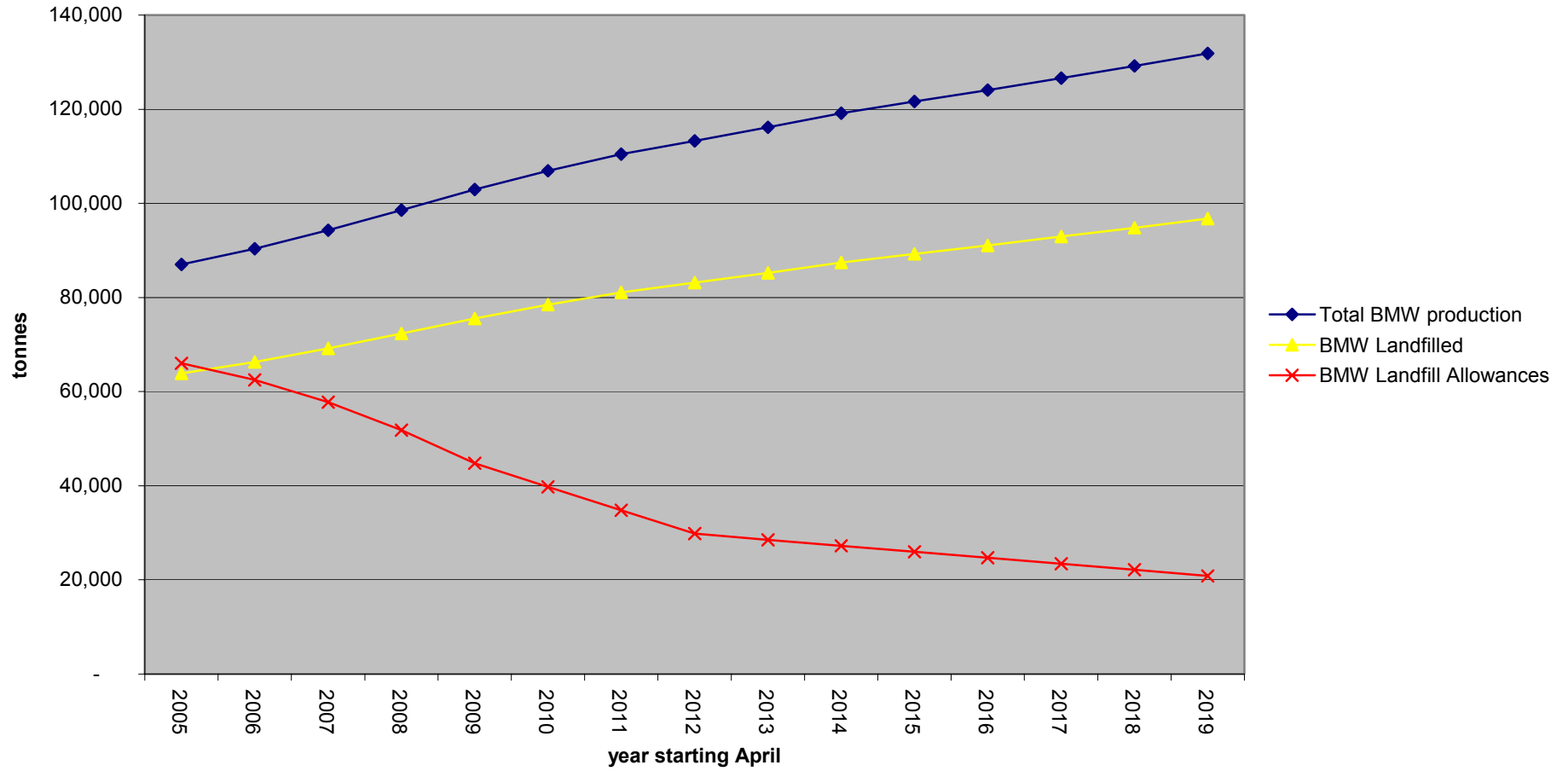
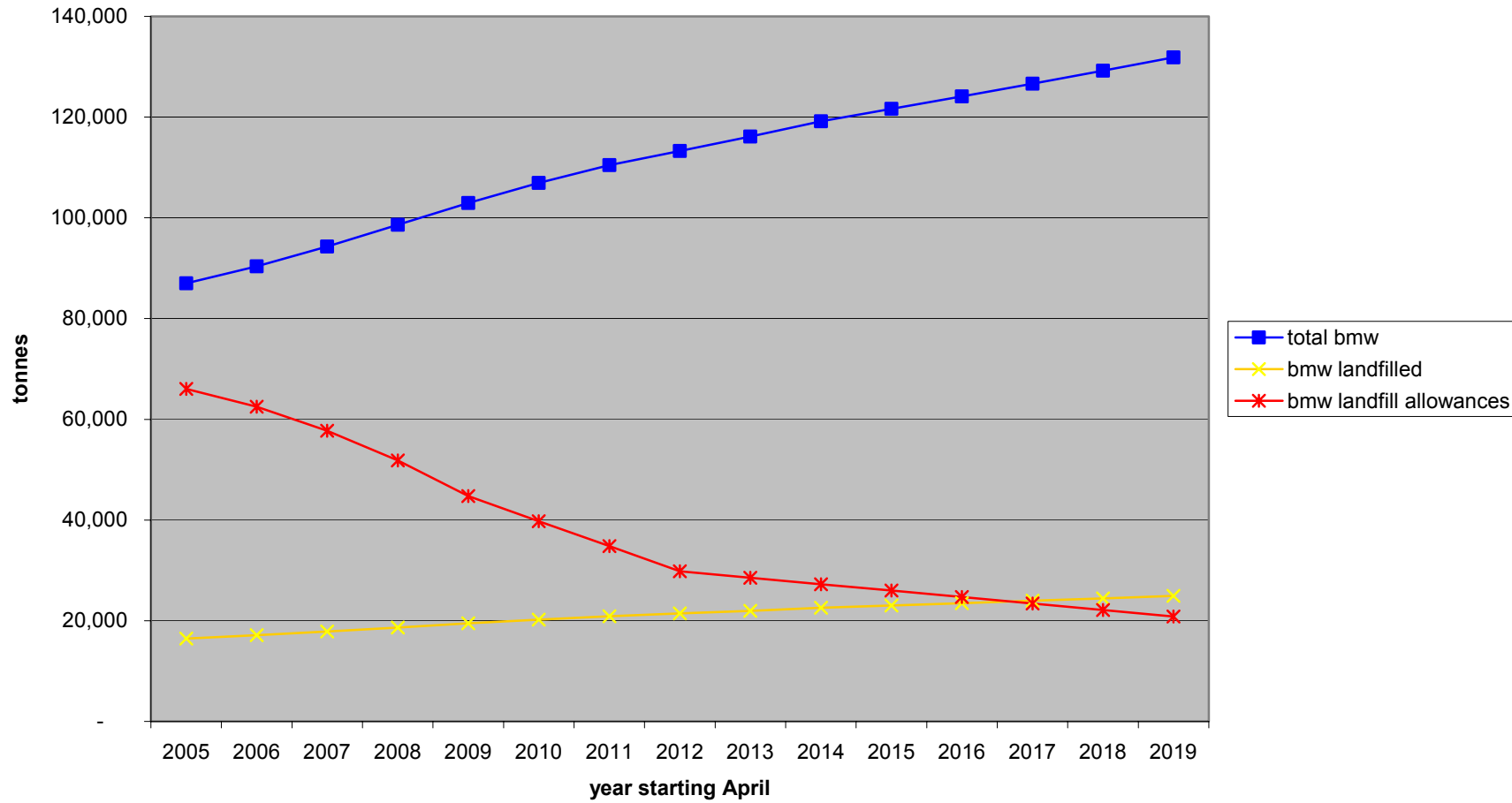


Table 3.1.4 - Cost of Buying Landfill Allowances at Different Price Levels (£k)

Price per tonne	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
£10	0	17	115	205	308	387	463	533	567	602	633	664	695	727	759
£30	0	50	344	616	924	1,161	1,388	1,600	1,702	1,806	1,899	1,992	2,086	2,181	2,278
£50	0	83	573	1,026	1,541	1,935	2,314	2,666	2,837	3,010	3,165	3,320	3,476	3,635	3,796
£75	0	125	859	1,539	2,311	2,902	3,470	3,999	4,255	4,515	4,748	4,980	5,215	5,452	5,694
£100	0	167	1,146	2,052	3,081	3,870	4,627	5,332	5,673	6,020	6,331	6,640	6,953	7,269	7,593
£125	0	209	1,432	2,565	3,851	4,837	5,784	6,665	7,091	7,525	7,913	8,299	8,691	9,087	9,491

Chart 3.1.2 If MKC were to recycle or compost 100% of all paper, cardboard, kitchen, garden, textile and wood waste



Chapter 3.2

Recycling and Composting Targets

Apart from landfill allowances the Council must take account of several sets of recycling and composting targets in deciding how to proceed in the future.

These are summarised as shown in Table 3.2.1. The Council has already exceeded the 2005 national target set in “Waste Strategy 2000” and is likely to be close to statutory targets and performance plan targets and the 2010 national “Waste Strategy 2000” target by 2005. It is also likely to meet the proposed statutory recycling target for 2007/8

However, it is unlikely to meet the first target set in the regional strategy. The regional strategy targets are more ambitious than statutory targets. ***As a “zero waste” strategy, Milton Keynes Council should set high targets for recycling and composting, and it is therefore proposed that the regional strategy recycling and composting targets are adopted for Milton Keynes Council.***

In order to meet these targets, it will be necessary to consider all aspects of waste collection and processing. Local authorities adopt a variety of approaches to kerbside recycling, garden waste, food waste and the collection of residual waste. Each of these approaches has its advantages and disadvantages, governed not only by individual elements but also by the way and combination in which changes are introduced. The nature of the area also has an effect. Authorities achieving the best recycling rates tend to be rural/small town areas, and indeed in Milton Keynes it has been noted that rounds in the more rural areas tend to have better recycling rates.

A key factor is whether or not residents support recycling and collection systems in their own area. Public participation is a crucial element in achieving high recycling and composting targets. For example, some authorities have moved to alternate weekly collection for residual waste. Experience in Milton Keynes has been that this is not popular with residents and it is therefore intended to maintain the level of service offered by weekly residual collection.

Feedback from the Consultation

There was support for adopting the regional targets in the technical questionnaires and by the CAGOW. The CAGOW commented that the targets would be hard to reach, perhaps unachievable. However, there is widespread support for the aspiration of zero waste.

Table 3.2.1 Summary of recovery, recycling and composting targets

	2005/6	2006/7	2007/8	2010	2015	2020	2025
Statutory Recycling and Composting Targets – BVPI 82a&b added together %	30 <i>(revised downwards by DEFRA from 36%)</i>		30 <i>(current proposed target – but could go as high as 36%)</i>				
The Council Best Value Performance Plan targets- 82a - % of household waste recycled	19	19.5	20				
The Council Best Value Performance Plan targets – 82b - % of household waste composted	11	11.5	12				
Regional Strategy – MSW recycling & composting target %	30			40	50	55	60
National Waste Strategy 2000 recycling and composting targets for household waste	25			30	33		
National Waste Strategy 2000 recovery targets for household waste (includes energy recovery)	40			45	67		

In 2005/6 it is hoped that Milton Keynes Council will achieve a recycling and composting target of 30%, meeting its statutory targets. In order to ensure continuous improvement, the Council proposes to adopt a target of 34% recycling in 2007/8.

It is proposed that Milton Keynes Council adopts the region’s targets for recycling and composting in following years.

The proposed recycling and composting targets are now revised as follows:

Year	2005/6	2006/7	2007/8	2010	2015	2020	2025
Recycling and Composting Rate % for MSW	30	32	34	40	50	55	60

SECTION 4 - HOW DO WE GET THERE?

Chapter 4.1 Options for Future Waste Management

This chapter describes the collection and disposal options that are available to the Council in the future. The following chapter (4.2) will examine the technical ability of those options – i.e. their ability to improve recycling rates and divert biodegradable municipal waste from landfill. It will also examine their relative financial costs. Chapter 4.3 examines the options from a “Best Practicable Environmental Option” perspective. Chapter 4.4 examines available data on the disposal options from a health perspective.

Collection Options

There are many ways that municipal waste could be collected, and across the UK each local authority collects a different range of recyclables, using different containers and frequencies of collection for both recyclables and residuals to its neighbouring authorities; there is little uniformity.

Most municipal waste in Milton Keynes is collected via the kerbside refuse and recycling schemes; the kerbside collection budget is the largest single item in the Council’s waste management budget. Therefore this section examines available options for kerbside collections.

There are three main variables that Milton Keynes Council needs to look at in relation to kerbside collection:

- Range of recyclables and compostables collected
- Frequencies of collection of recyclables, compostables and residuals
- Types of container used for both recyclables, compostables and residuals.

The range of recyclables and the frequency of collection can have significant impacts on costs – generally the greater the number of separate streams that are required and the more frequently they are collected, the greater the cost. These two components also significantly affect the recycling rate.

The types of container most in use are wheeled bins and plastic sacks, which can be used for recyclables, compostables (in the case of compostables the sacks would usually be biodegradable) and residuals. Recyclables can also be collected in boxes of 35-50 litres size. Local authorities are not legally required to provide containers for refuse collection, and some choose not to do so,

requiring residents to purchase their own containers. The type of container used for residual refuse collection tends to have less effect on costs; in particular there is little difference over a typical contract period between the use of wheeled bins or sacks. However, the choice of container can have a significant impact on the success of a scheme (due to public perception), financing (since considerable capital investment is required for wheeled bins) and litter /vermin control (wheeled bins generally giving better control). Large wheeled bins for residual refuse collection can increase the quantities delivered into the collection system.

Other variables to be considered are the types of vehicle to be used, the type of housing, and the nature of the recycling facilities available as these are an integral part of the collection system, and must be compatible with it. The choice of vehicle would normally be that of the contractor undertaking the service. Milton Keynes is fortunate in that due to its grid-road layout, having generally wide roads with few restrictions larger vehicles can be accommodated than in some other local authority areas. In addition there are relatively fewer flats compared with some areas. However, in future new developments with a higher density of housing, this may not be the case.

All collected recyclables usually need to be transferred to a MRF for bulking up. Some MRFs are “simple” e.g. simply some tipping bays and a loading shovel. Materials are simply tipped and bulked up to be sent to their respective recycling or composting outlets. A “simple MRF” could not handle materials that were co-mingled in the same container. However, this would free up land for other purposes and would cost less. Alternatively a MRF could be similar to the existing MRF i.e. a “complex” MRF capable of handling a wide range of mixtures of materials.

It is important that whichever system is chosen, the components – containers/vehicle/MRF etc are compatible.

A wide range of collection options are available, and to analyse all possible options would be very time consuming and expensive. In order to narrow down the options for evaluation, three combinations of recyclables have been chosen for evaluation:

- Option 1 – “maximum biodegradables” option - concentrating on removing the main biodegradable components i.e. paper, cardboard, garden and food waste, with an emphasis on LATS compliance. This requires only a simple MRF and for separation of the paper and cardboard before sending them to their respective industries. A baler would be required for the cardboard. It would also require tipping bays for onward transfer of compostables to a composting plant.
- Option 2 – “heavy option” - concentrating on removing the main heavy items that contribute towards recycling rate – paper, glass, garden and food waste. A very simple MRF is required for this, comprising tipping bays only
- Option 3 – “maximum recycling” – in this option, all recyclables that can currently be recycled in the UK are separated out for recycling. This includes paper, cardboard, drinks cartons, glass, cans, plastics, garden waste and food waste. This requires a complex MRF, similar to the

MRF as it was in Wolverton, with some extra capability to handle drinks cartons, and bulking up bays for onward transfer of compostable materials.

All these have been modelled in a scenario where residual refuse is collected weekly.

To have the best possible information for comparison, the options for maximum biodegradable recycling, 'heavy' recycling and maximum recycling have been subject to sensitivity tests in respect of alternate week collection of residual waste and two scenarios for the collection of garden & food waste. The Council has received various advice on the issue of collecting food waste, and since food waste collections are relatively uncommon in the UK, there is little evidence yet to establish best practice.

In the first scenario, the garden waste and food waste are collected together, weekly in a wheeled bin of 140 litres size. It is believed that residents may prefer this since the garden waste "cleans out" the food waste in the bin. It has the advantage in that collections are easier and probably less costly than having separate collections. However, all the garden waste must go to an in-vessel composting plant, which is likely to increase the cost of composting. In addition, residents would in effect be offered a free garden waste collection year round. While this may improve the composting rate it may also increase the overall amount of MSW since residents may divert materials to the stream that would not otherwise have entered it (e.g. from home composting).

A second scenario has therefore been modelled for food waste collection (Scenario b). In this scenario the food waste is collected separately in purpose designed 25 litre containers. Garden waste would be collected as it is now i.e. fortnightly for nine months of the year in a chargeable service. This would not be expected to increase the overall MSW stream. Only the food waste would attract the higher composting costs, but the collection cost would be higher since a separate stream is required for it.

The extent to which residents will divert food waste in either scenario is not known, and assumptions regarding food waste diversion have been cautious. Early work has shown that among the local authorities currently attempting to divert food waste, recovery rates can be very variable. However, this may improve as more knowledge is gained on the subject. The Council began a trial of both methods of collection in September 2005.

Treatment and Disposal Options

Recycling

Recyclable materials removed from the waste stream are normally transferred to a Materials Recycling Facility (MRF) for bulking up, sorting, quality control and baling or some other form of compaction if appropriate. MRF's may be quite simple, comprising a weighbridge, a few tipping bays and shovels or other loading equipment, or they may be more complex involving a range of sorting equipment and balers. The MRF at Wolverton was a complex MRF before the

fire; equipment it contained included a bag splitter to split open the pink sacks, a screen to separate paper from cans and plastics, several manual sorting cabins, and near infrared sorting units to separate out different types of plastics. From a MRF, the sorted materials are transferred to markets for the materials in bulk – usually involving road transport in larger vehicles. It is unlikely that the markets will be local. The number of reprocessors in the UK for most materials are relatively small; most are more than 50 miles from Milton Keynes; and sometimes better prices for materials are obtained by exporting materials. Typical outlets that have been used by the Milton Keynes MRF in the past have been paper mills in Cheshire, Kent or North Wales; aluminium can reprocessors in Warrington; steel can reprocessors in Hartlepool or South Wales; glass reprocessors in Yorkshire, Kent and Essex and plastics reprocessors in Cheshire or as far away as the Far East.

Composting

Composting is a biological process in which biodegradable wastes are decomposed in the presence of air by the action of micro-organisms such as bacteria and fungi. For the composting to occur in an optimum manner – producing a compost free of weeds, pests and diseases - five key factors need to be controlled by the process:

- Temperature
- Moisture content
- Oxygen concentration
- Particle size
- Ratio of carbon to nitrogen (controlled by blending materials high in carbon such as woody materials or leaves with materials high in nitrogen such as grass clippings and most types of food waste).

Compostable materials are normally taken, sometimes via a transfer station, to either an “open windrow” composting operation or an “in vessel” composting plant.

“Open windrow” types of compost plant are only suitable for separated garden waste due to restrictions on the composting of animal by-products, which for regulatory purposes include all kitchen wastes. This process can be carried out on farms. The garden waste is normally shredded, placed in long rows, and turned at frequent intervals to ensure adequate aeration. This ensures that whole mass of material is effectively treated, and that temperatures are reached to make the compost hygienic. This period may typically take around twelve weeks. The compost is then left to mature for a longer period of several months before use. If the material is composted on a farm it is then usually screened and used as an agricultural fertiliser. Licensing and sometimes planning restrictions prevent the sale of materials from the farm. If the open windrowing takes place at a commercial central composting plant then the compost is usually screened, sometimes blended with other materials and either sold in bags or in bulk. Typical outlets would be the horticultural industry, agriculture, or the public at CA sites. Quality control is especially important when the materials are to be sold, and a new voluntary standard “PAS 100” has recently been developed to encourage buyer confidence. Good composting requires

monitoring of the whole composting process – in particular the monitoring of incoming materials, temperature and moisture content is important.

There are a relatively large number of open windrow operations in the UK, including two within Milton Keynes and several more within twenty miles.

“In vessel” composting plants are more complex, and are more expensive to build and operate if they process food waste to meet animal byproducts regulations. There are relatively few at present in the UK, though the numbers are growing; the nearest currently operating is the recently-opened plant at High Wycombe in Buckinghamshire. They are being built as a response to the requirements of animal byproducts legislation and the need to divert more food waste away from landfill. The key feature of an in-vessel plant is that the early stages of composting in which the compost is sterilized are enclosed. Later, maturing phases may take place in the open. If the plant is to meet compliance with animal byproducts legislation it must also, amongst other requirements, demonstrate separation between areas receiving incoming and outgoing materials; exclusion of certain animals, and a high degree of monitoring and process control. The plant must also consider outlets for the materials carefully as legislation restricts how composts containing animal byproducts can be used.

Anaerobic Digestion (AD)

Anaerobic Digestion is a biological process where biodegradable wastes first treated in such a way to reduce the size of the particles and then mixed with water (or slurries) and undergo a decomposition process in the absence of air. It takes place in an enclosed vessel under controlled conditions.

The wastes degrade to produce methane and other gases collectively known as “biogas” which can be collected and burnt as a fuel to produce electricity, or cleaned and compressed to form a vehicle fuel. If electricity is generated, this attracts Renewables Obligation Certificates (ROCs). ROCs provide a financial incentive for the production of electricity from renewable sources.

The remainder of the material forms a “digestate” – a mixture of biosolids and liquid. If only source-separated wastes such as garden and kitchen waste are used, the digestate can be further processed and used as a fertiliser. Most AD plants should be able to comply with animal byproduct legislation as long as they incorporate a simple pasteuration phase. Digestate used as a fertiliser contributes towards composting targets. However, if non-separated MSW is used, then the digestate is unlikely to be suitable for use as a compost-like material, and will need to be dewatered before landfilling or possibly used as a fuel. It may have considerable biodegradability unless treated prior to landfilling. Some plants have mechanical treatment at the start of the process to remove non-biodegradable materials/recyclables prior to the AD process – in this situation the plant becomes more like an “MBT” plant (see next sub section)

The liquor or filtrate from any dewatering process is rich in organic compounds and can be recirculated through the process, used as a fertiliser, treated or disposed to sewer, dependent on the nature of the process and the

characteristics of the liquor, especially whether source segregated biowastes are used as an input or mixed MSW.

At present there are few AD plants for MSW in the UK. Two demonstrator plants have recently received DEFRA funding and there is one commercially operating plant in Leicester. The Council has, however, recently learnt of a plant near Bedford due to open in 2006 which will be able to accept source separated organic/catering waste streams, compliant with Animal Byproducts legislation. The technology is more widespread in mainland Europe. However, AD has been widely used in the UK for many years to treat sewage; although the process is fundamentally the same, different temperatures are required to treat sewage.

Mechanical Biological Treatment (MBT)

The term “MBT” is used to describe a wide range of waste treatment plants. The only factor that these plants have in common is that they combine some form of mechanical treatment with some form of biological treatment of the waste. MBT is usually used to treat residual wastes, after front-end separation of recyclables. The composition of the incoming waste will therefore vary depending on the degree of front-end recycling.

Mechanical treatments may include:

- Crushing, shredding or some other form of size reduction
- Sorting to remove recyclables (e.g. using magnets, eddy currents and near infra red scanners)
- Screening into separate fractions e.g. an oversize fraction; an organic rich fraction more suited to composting or AD; or a fraction containing a lot of inert materials suitable for aggregate use.

The biological treatment is usually one of the following:

- “biodrying” – a process using the same principles as composting, but primarily aimed at driving off the moisture from the waste rather than degrading it; such wastes are still biodegradable and are usually intended for use as a fuel rather than for landfilling
- Enclosed composting
- AD

In some plants the biological phase is at the beginning; in others the mechanical phases come first.

The outputs from MBT processes fall into the following broad categories:

- Recyclables (usually metals and sometimes plastics, aggregates or paper/card)
- Compost-like materials, usually contaminated by some of the mixed waste from which the material was derived
- Refuse derived fuel (RDF) for use either in industrial applications or thermal treatment plants (see below)

- Biogas and hence energy (from AD plants).

The proportion and quality of each output varies widely depending both on the process and the quality of the incoming feedstock. Some plants primarily aim to produce an RDF via biodrying. However, the number of outlets for RDF in the UK is limited, and marketing RDF may be difficult unless the plant also has access to a use for the RDF; typically this may be a fluidised bed gasifier/incinerator; the calorific value can be similar to coal.

Compost-like substances are often also difficult to market as compost since they are not made from source-separated waste. They may not contribute to composting targets due to their poor quality. Uses are often limited to cover on landfills and similar applications. Some processes aim to stabilise the waste prior to landfill in order to meet Landfill Directive requirements, rather than to produce a useable compost or an RDF. The degree to which they stabilise depends on the plant, and the length of time that the material spends in the stabilisation process.

The quality of the recyclables also varies. While ferrous metals are usually saleable, others recyclables may not reach the quality standards required by reprocessors. However, some plants can produce clean, marketable recyclables. Typically MBT plants can contribute an extra 3-10% to the recycling rate, depending on the process and the composition of the incoming waste.

MBT is not currently well-established in the UK; in mainland Europe it is more widely used, particularly in Austria, Germany, Italy and Spain. However, a few UK local authorities have entered into contracts for MBT plant, and a demonstrator plant has recently received funding.

To some extent MBT plants can, and are, custom built to meet the clients requirements - a number of components can be "bolted together" to meet the recycling rate, energy output etc. specified.

A recent study by Juniper Consultants¹¹ is available on the internet and gives a very comprehensive review of this subject.

Energy from Waste

Energy from Waste (EfW) facilities combust waste under controlled conditions. The majority of EfW plants in the UK are designed to process significant quantities of waste with no need to pre-treat it before processing. However, DEFRA recommends that when used as part of an integrated waste management strategy, plants should be sensitively scaled after targeted levels of source segregated recycle and biodegradable waste collections have taken place.

EfW plants require process control measures for emissions and extensive flue gas cleaning equipment. There is also a requirement to deal with the residues

¹¹ Report by Juniper Consultants for Sita Environmental Trust, 2005
<http://www.sitatrust.org.uk/research/overview>

of the combustion process. There are two principal solid residues – “bottom ash” and “air pollution control” (APC) residues. Bottom ash is the solid remainder of the waste feedstock after processing. APC residue is the residue from the flue gas cleaning process. This is classified as hazardous waste and requires specialist treatment. The former is often used in construction applications, or may be landfilled. Some EfW plants recover metals from the bottom ash.

An EfW plant is principally designed to reduce the volume of the waste and to generate electricity and/or heat. At present the electricity does not attract ROC's. To use the heat, a distribution system is required and this is often easier to install in new-build properties than in established areas.

Until recently EfW plants in the U.K. have tended to be large scale (around 200,000 tonnes or even up to 600,000 tonnes per annum) and take advantage of economies of scale. Over time, a number of smaller facilities have emerged. The decision to use one large plant or a number of smaller plant will have implications for the number of planning permissions and permits required, although smaller plants may be integrated into a more local solution for smaller communities.

There are two principle types of EfW plant in use in the UK: Moving Grate and Fluidised Bed. Moving Grate plants are the more common. The waste is slowly moved through the furnace by a mechanically moved grate. Waste enters continuously at one end and is continuously discharged at the other. As the waste moves through the furnace it undergoes complete combustion.

In Fluidised Bed plants the waste must first undergo preparation to remove heavy and inert objects, and to reduce particle size. The combustion is then normally a single stage process in a lined chamber with a bubbling bed of inert material such as sand. The bed is “fluidised” by air (or recycled flue gas) being blown vertically through the bed, and the waste is moved through the furnace on the bed of particles. RDF from MBT plants can be a suitable feedstock for fluidised bed plants.

In other countries a type of EfW plant known as an “oscillating kiln” in which the waste is moved through the plant by a rocking or oscillating action is also used. In France these are used for small-scale plant (25-60,000 tonnes per annum); it is reported that one such facility is being developed in Northeast Lincolnshire

Advanced (or alternative) Thermal Treatment (ATT)

Advanced (or alternative) Thermal Treatments comprise principally two processes which are relatively new in their application to municipal solid waste, though they have been used in other sectors for many years. The two processes are Pyrolysis and Gasification. Both qualify for ROC's. Only a few such plants operate in the UK and overseas experience is patchy. They may be more appropriate to processing specific problem streams (e.g. a plant in Bristol processes mainly clinical waste). Their typical small scale (30-60,000 tonnes per annum) could yield benefits in terms of compliance with the proximity principle and ease of obtaining planning permission. Wastes entering these

technologies must undergo a preparation stage to remove inert materials and reduce particle size. RDF from MBT may be a suitable feedstock for these processes. Air pollution control measures are necessary with both types of plant; operators often claim that the processes reduce the quantity of air pollution requiring cleaning.

Pyrolysis is a medium temperature (around 500C) process in which the waste is heated in the absence of oxygen. The organic/carbon-based element of the waste – plastics and paper etc. is broken down. The process produces a gas that can be condensed to form an oil. Either the gas or the oil can be used to generate electricity or in an engine. A solid slag (pyrolysis char) is also produced which may require disposal or additional processing.

Gasification operates at a higher temperature, typically 1,000 -1,200 c. Air or oxygen is used to partially combust the waste to achieve higher temperatures. Water or steam is added to the feedstock. The water “cracks” into hydrogen and oxygen at the higher temperatures and the oxygen reacts further with the carbon in the feedstock. The gas produced is known as “syngas”; it has a high concentration of hydrogen and can be combusted to produce electricity. A solid char is also produced which requires disposal.

Autoclaving

Autoclave technology has been used for many years in other areas as a sterilising process, especially in hospitals, but it has only recently been applied to MSW and there are no operating plants in the UK. It is believed that planning permissions are currently being sought for some small-scale plants.

Autoclaving involves the use of steam and pressure. Pre-treatment of MSW is required to reduce the particle size. It is then placed in a pressurised sealed drum under the action of steam. After around an hour the waste is reduced to a “flock” like material. Metals and glass are separated out and are cleaned by the process. Plastics are deformed in the processes and are not recoverable. The flock has a high calorific value and is suitable as an RDF for fluidised bed incineration or ATT; however, if landfilled it is still largely biodegradable. Autoclaving plants may achieve animal byproduct legislation compliance.

Landfill

Landfill – i.e. the placing of wastes into land - has been the main disposal route for most MSW in the UK until very recently. However, due to a diminishing supply, more regulation, landfill tax and landfill allowances, the use of landfill is becoming more expensive and, for dealing with untreated waste, undesirable. It will, nevertheless, be required as a final disposal point for wastes which are not recyclable/compostable and which have undergone one or more of the treatments listed above to render it less biodegradable.

Around the Milton Keynes area, there is a relatively large supply of landfill compared with most of the UK, and with the rest of the South East. Nevertheless, this supply is also diminishing. Only one site accepting MSW (Bletchley) is actually within the Borough of Milton Keynes, though there are

some smaller sites that can accept inert wastes. Sites accepting hazardous wastes are diminishing in the UK, and the most local site in Bedfordshire may close very shortly.

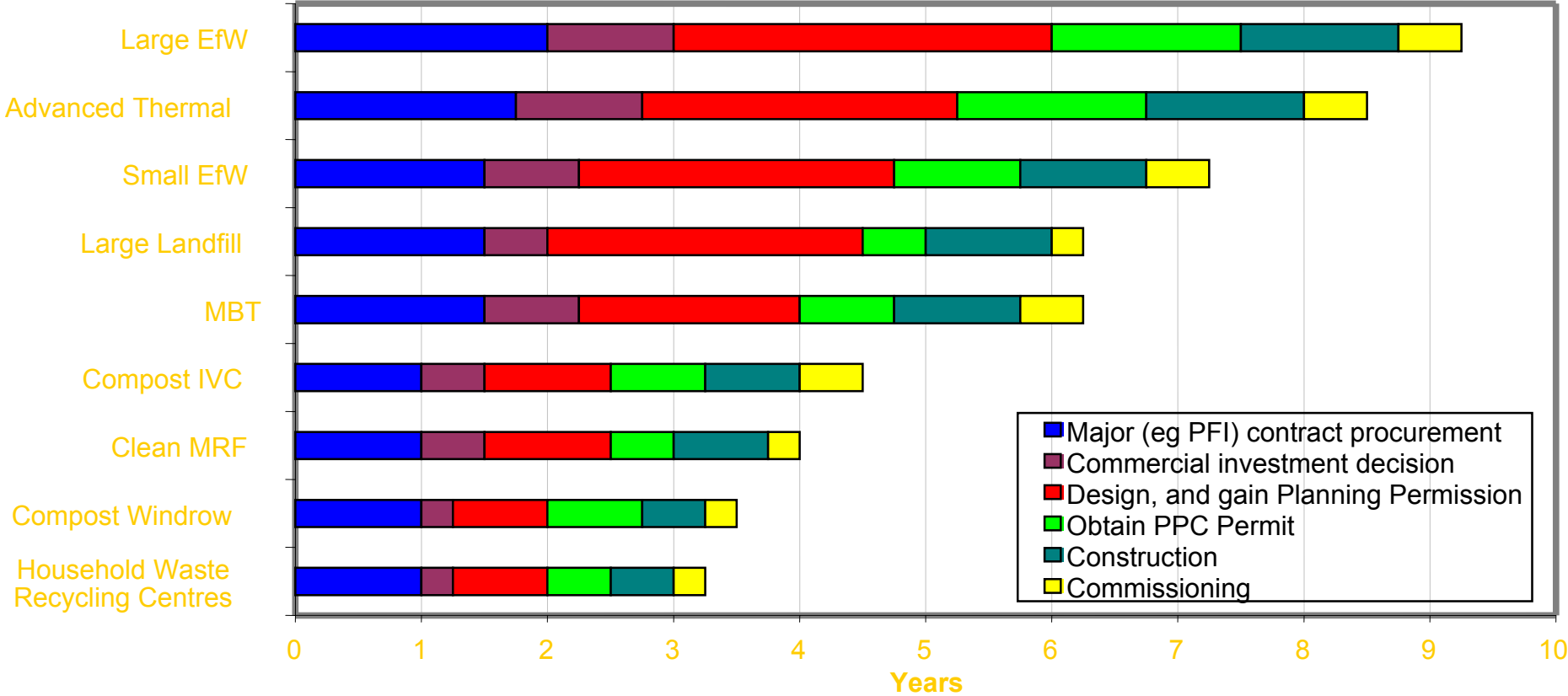
Landfills must now meet new acceptance criteria and have greater controls than before. In particular they must control the emissions of methane, leachate (liquid effluent), odours, and litter. They need to have a plan for aftercare once the site is full. Some sites must have lining membranes.

Delivery periods

Delivery periods for larger plant tend to be longer than those for smaller plant. They also depend on the technology. The results of a recent study by Enviro Consultants for DEFRA is illustrated in Chart 4.1.1. This chart represents a “worst case” scenario in which processes run in sequence. In practice, it may be possible for some of the processes to run in parallel e.g. the procurement and the commercial investment decision or the planning permission and the PPC permitting.

Chart 4.1.1 (courtesy of Enviro Consultants for DEFRA)

Delivery Periods for Non-Hazardous Waste Management Facilities



More information on disposal technologies is available from DEFRA's Waste Technology Data Centre: <http://www.environment-agency.gov.uk/wtd/>

Evaluation of options in future chapters

There are now a large number of non-landfill options available to treat residual wastes, especially when all the permutations of MBT are taken into account. In the following chapters, the Council has selected 13 options for the treatment of residual wastes to be evaluated for technical, financial and BPEO. These comprise five MBT options – Options 1a to 1e. Options 1a-d use the “Eco-deco” system as a model, this is primarily a biodrying process designed to produce an RDF; it also produces some recyclables and screens to produce an organic rich fraction which is subject to in-vessel composting. The compost from the IVC process may have a limited market. In option 1a the RDF is used in an ATT process; in option 1b the RDF is used in a fluidised bed incinerator; in option 1c it is landfilled, and in option 1d it is sent to a third party (e.g. a cement kiln). Option 1e is an MBT process designed to produce a stabilised output for landfilling which is likely to have low biodegradability. The costs are based on a German plant using a “table windrowing” composting-type process.

Three AD options have been modelled (options 2a-c). All of these have some front end recycling and size reduction/screening to remove inert material which can be used for an RDF; thus they could also be considered MBT plants. In 2a the RDF is sent to ATT plant, in 2b it is landfilled and in 2c it is sent to a 3rd party.

Two ATT options have been modelled, one comprising a single large scale plant (3a) and one with several small scale plants (3b).

An ordinary mass-burn moving grate incinerator has been modelled in option 4

Two autoclave options, 5a and 5b, have been modelled. In option 5a the output from the autoclaving is used as an RDF in an ATT plant; in option 5b it is landfilled.

Chapter 4.2

Technical appraisal of collection and disposal options

Introduction

Two technical projects have been undertaken by Jacobs Babbie to assess the options available to the Council, one covering nine kerbside collection options and the other covering twelve disposal options for residual wastes. The technical projects appraised the options for both recycling/composting rate and diversion of BMW to assist in meeting LATS allowances. The appraisal of the twelve disposal options was carried out as part of a larger study undertaken with Buckinghamshire County Council between November 2004 and February 2005. At Milton Keynes Council's request a further disposal option (1e) was modelled separately in June 2005, at the same time that the nine collection options were modelled. All of these reports are available in full on Milton Keynes Council's waste website www.mkweb.co.uk/waste. Their results are summarised in this chapter.

Modelling Methodology

Overview

To consider suitable waste management and treatment options it is necessary to model the waste generated, including its quantity and quality. There are a multitude of factors that will influence waste generation characteristics, including, but not limited to changes in housing, population, the impact of waste minimisation initiatives, and the collection infrastructure available.

Qualification

Modelling stages are based on three underlying assumptions:

- The waste composition:
The Council provided recent waste compositional studies¹²
- How much waste there will be

¹² Household Waste Compositional Study April and November 2000 for Milton Keynes, www.mkweb.co.uk/waste

Known waste tonnages were used to predict future waste tonnages using assumptions on waste, population and growth provided by the Council

- The success of the strategy initiatives:
This is termed the capture rate and is described in Milton Keynes Council Waste Management Technical Options Appraisal¹³.

Collection Options

Three front end recycling arrangements have been modelled:

	Approach	Asset Requirement
Option 1 – Maximum Biodegradables Diversion	Kerbside recycling with a focus upon the BMW component of household waste. – collection of paper, cardboard, garden waste & kitchen waste kerbside, weekly	Simple MRF / Bulking Facility
Option 2 – “Heavy” recycling	Kerbside recycling with a focus upon the ‘Heavy’ component of household waste – collection of paper, glass, garden and kitchen waste kerbside, weekly	Simple MRF / Bulking Facility
Option 3 – Maximum Recycling	Kerbside recycling with a focus upon recycling as much as possible from the household MSW stream – weekly collections of paper, cardboard, glass, cans, plastic bottles, kitchen waste & garden waste weekly, kerbside	Complex MRF

There were also two sensitivity tests applied to each of the three options:

Sensitivity Test a -	Alternate week collection of residuals and weekly mixed kitchen & garden waste all together all year round in a wheeled bin, free of charge
Sensitivity Test b -	Garden waste fortnightly collection on a chargeable basis, for 9 months of the year plus kitchen waste collected weekly in a separate caddy

The combination of the three arrangements and two sensitivity tests produced nine different front end collection options. The performance of these options

¹³ Buckinghamshire County Council & Milton Keynes Council Waste Management Technical Options Appraisal, Formal Issue, Version 2, 8th February 2005, available on www.mkweb.co.uk/waste

against recycling and composting, and against biodegradable diversion targets is outlined in the following tables.

Table 4.2.1 – Front end Recycling / Composting targets projected for Collection Options

Collection Option	Description	2005	2010	2015	2020
Option 1	Maximum biodegradable + weekly residuals	27%	31%	37%	37%
Option 2	“Heavy” recyclables + weekly residuals	27%	33%	40%	40%
Option 3	Maximum recycling + weekly residual	27%	35%	42%	42%
Option 1a	Maximum biodegradable + alternate week residuals	27%	33%	39%	39%
Option 2a	“Heavy” recyclables + alternate week residuals	26%	34%	40%	40%
Option 3a	Maximum recycling + alternate week residuals	27%	37%	44%	44%
Option 1b	Max. biodegradables + weekly residuals, food waste separate	27%	27%	33%	33%
Option 2b	“Heavy” recyclables + weekly residuals food waste separate	26%	28%	34%	34%
Option 3b	Maximum recycling + weekly residual food waste separate	27%	31%	38%	38%

Table 4.2.2 – Front End LATS diversion projected for Collection Options

Option	Description	Shortfall/excess			
		2005	2010	2015	2020
<i>Target</i>		48,332	32,792	21,415	17,198
Option 1	Maximum biodegradable + weekly residuals	2,420	- 28,237	- 41,464	- 53,847
Option 2	“Heavy” recyclables + weekly residuals	2,420	- 28,268	- 41,496	- 52,991
Option 3	Maximum recycling + weekly residual	2,420	- 27,744	- 40,923	- 52,360
Option 1a	Maximum biodegradable + alternate week residuals	2,420	- 26,069	- 38,922	- 51,046
Option 2a	“Heavy” recyclables + alternate week residuals	2,420	- 25,938	- 38,951	- 50,188
Option 3a	Maximum recycling + alternate week residuals	2,420	- 25,582	- 38,388	- 49,568
Option 1b	Max. biodegradables + weekly residuals, food waste separate	2,420	- 33,830	- 48,417	- 61,504
Option 2b	“Heavy” recyclables + weekly residuals food waste separate	2,420	- 33,862	- 48,448	- 60,648
Option 3b	Maximum recycling + weekly residual food waste separate	2,420	- 33,337	- 47,876	- 60,018

As can be seen from Tables 4.2.1 and 4.2.2, the approach using maximum kerbside recycling is predicted to give the strongest performance on recycling and the lowest excess above the Council’s LATS allowance.

Options 2, 3, 2a all meet 40% recycling by 2015.

Residual Disposal Technologies

The Collections Options appraisal was commissioned after the Disposal Options Appraisal. The Disposal Options Appraisal used an “Optimised Front end” recycling option as the input to the model. This assumed

- All current and planned initiatives are implemented
- Front end recycling systems are pushed out to maximum (increasing participation and/ or recognition, roll out and targeted streams to maximum).

This gave a LATS position as shown follows, indicating that further treatment is required to comply with LATS

Table 4.2.3 - LATS position used for disposal option evaluation

	2005	2010	2015	2020
LATS Targets	63,547	38,352	25,046	20,114
LATS Front End 'Optimised'	3,858	-13,362	-26,830	-38,060

The residual disposal appraisal considered two levels of recycling performance based upon the success of either certain planned initiatives or optimised initiatives. A complex MRF facility was very much integral to both the planned and optimised initiatives and to some extent prescribed the available recycling parameters.

The disposal technologies that were modelled are as shown as follows:

Table 4.2.4 - Disposal Technology combinations that have been modelled

1a	MBT + ATT + IVC	Mechanical Biological Treatment + Advanced Thermal Treatment of RDF + In-Vessel Composting of waste derived compost.
1b	MBT + FBG+ IVC	Mechanical Biological Treatment + Energy from Waste/ Fluidised Bed + In-Vessel Composting of waste derived compost.
1c	MBT + IVC + Lf	Mechanical Biological Treatment + In-Vessel Composting of waste derived compost + Landfill
1d	MBT + IVC + RDF to 3 rd Party	Mechanical Biological Treatment + In-Vessel Composting of waste derived compost + RDF treated in a third party thermal facility
1e	MBT stabilised	Mechanical Biological Treatment with residue stabilised to comply with Landfill Directive requirements
2a	MT & AD + ATT	Mechanical Treatment + Anaerobic Digestion of waste derived compost + Advanced Thermal Treatment of RDF + maturation of digested compost product
2b	MT & AD + Lf	Mechanical Treatment + Anaerobic Digestion of waste derived compost and kerbside organics + Landfill
2c	MT & AD + RDF to 3 rd Party	Mechanical Treatment + Anaerobic Digestion of waste derived compost and kerbside organics + RDF treated in a third party thermal facility
3a	ATT	Advanced Thermal Treatment
3b	ATT (Multi)	Advanced Thermal Treatment (Modules at multiple sites)
4	EfW	Energy from Waste recovery
5a	AC + ATT	Autoclave + Advanced Thermal Treatment
5b	AC + Lf	Autoclave + Landfill

Three scenarios have been modelled: **Do Minimum**, **Meet Targets** and **Exceed Targets**, as per current good practice guidance.

Under **Do Minimum** the existing level of service is modelled, and any LATS excess must be paid for.

Under the **Meet Targets** scenario the treatment technology is modelled to process the minimum amount of (post front-end) throughput required in order to comply with the LATS targets, plus a 10% buffer.

Under the **Exceed Targets** scenario the maximum amount of tonnage that could be processed through the treatment technology facilities is modelled, thus, giving the best possible performance against LATS targets. This may for certain options generate a LATS buffer and the possibility of LATS permit trading.

The tables below show the performance of each technology:

Table 4.2.5 - LATS compliance and recycling performance in 2020 under **Meet Targets** scenario

Options	Waste throughput	Front End recycling/ Composting	Recycling gained by Technology	Overall recycling/ composting	LATS (Shortfall/ Excess)	Tonnage landfilled
1a	78,400	45.7%	3.7%	49.4%	2,011	58,310
1b	78,741	45.7%	3.9%	49.6%	2,011	50,466
1c	98,795	45.7%	5.2%	50.9%	-10,464	81,388
1d	78,400	45.7%	3.7%	49.4%	2,011	50,746
1e	98,795	45.7%	1.1%	46.8%	834	67,618
2a	90,157	45.7%	10.0%	55.7%	2,011	69,041
2b	98,795	45.7%	12.0%	57.8%	-12,870	93,976
2c	90,091	45.7%	10.4%	56.1%	2,011	95,992
3	76,634	45.7%	3.1%	48.8%	2,011	53,501
3	76,634	45.7%	3.1%	48.8%	2,011	53,501
4	75,131	45.7%	0.5%	46.3%	2,011	72,341
5a	87,689	45.7%	6.4%	52.2%	1,609	55,730
5b	87,689	45.7%	6.4%	52.2%	-38,766	102,289

Table 4.2.6 - LATS compliance and recycling performance in 2020 under **Exceeds Targets** scenario

Options	Waste throughput	Front End recycling/ Composting	Recycling gained by Technology	Overall recycling/ composting	LATS (Shortfall/ Excess)	Tonnage landfilled
1a	98,795	45.7%	5.2%	50.9%	14,914	43,819
1b	98,795	45.7%	5.3%	51.1%	14,639	36,982
1c	98,795	45.7%	5.2%	50.9%	-10,567	83,020
1d	98,795	45.7%	5.2%	50.9%	14,914	34,018
1e	98,795	45.7%	1.1%	46.8%	834	67,618
2a	98,795	45.7%	12.0%	57.8%	6,754	65,514
2b	98,795	45.7%	12.0%	57.8%	-12,973	57,927
2c	98,795	45.7%	12.0%	57.8%	6,754	57,927
3a	87,689	45.7%	3.8%	49.5%	10,075	44,932
3b	87,689	45.7%	3.8%	49.5%	10,075	44,932
4	87,689	45.7%	0.7%	46.4%	11,232	86,813
5a	87,689	45.7%	6.4%	52.2%	1,507	56,845
5b	87,689	45.7%	6.4%	52.2%	-38,868	104,345

The tables underline that certain options, notably 1c, 2b and 5b, consistently fail to meet LATS targets. These are solutions that involve landfilling potentially useable/ treatable material. The fourth column shows that certain technology mixes can yield a significant quantity of additional recycling/ composting performance through recovery of materials from the residual waste stream, particularly in option 2 using the integrated MT & AD technology mix.

Chapter 4.3

Financial appraisal of collection and disposal options

Using confidential bidder's data, industry reports, market reports, and Environment Agency data, Jacobs Babbie have determined the Operational Expenditure (OPEX) and Capital Expenditure (CAPEX) of each collection and disposal option, with the technologies being sized to cope with the maximum throughput where relevant, at any one time during the contract period. Full details are available in the Jacobs Babbie and ORA reports on Milton Keynes Council website www.mkweb.co.uk/waste.

These assessments are objective and impartial and do not consider preference, planning or the wider criteria of choice. The CAPEX and the OPEX are combined to give the Net Present Value (NPV). This compares the value of a £ today versus the value of that same £ in the future, taking inflation and return into account. This assumes that money values change with time because they are affected by interest rates i.e. £10 today has more value than £10 next year, and therefore in future years one would have to spend more to process the same quantity of waste. The NPV's shown therefore are the expenditure on specific options adjusted back through a 24 year contract period to show the true value in today's terms required to ensure the same level of value is achieved throughout the contract.

The NPV not only includes the CAPEX and the OPEX but also all revenues and where necessary expenditure on permit buying. It does NOT include land purchase costs, any costs for permitting/licensing or the revised core discount rate, structural tax impacts and optimism bias associated with funding options. A 2.5% rate of interest has been assumed. Landfill gate fees have been modelled at 1% above this rate at 3.5%

Collection Options

The assessment considered the net present value (NPV) of each of the nine collection options assessed in the previous chapter -

- Including MRF costs
- Excluding MRF costs

This is examined in Tables 4.3.1 and 4.3.2

Table: 4.3.1 -NPV of collection options including MRF costs

Option		NPV £M		
		NPV £M	pa	NPV £/t
2a	“Heavy” recyclables + alternate week residuals	161	6.71	35.26
1a	Maximum biodegradable + alternate week residuals	165	6.86	36.06
1	Maximum biodegradable + weekly residuals	187	7.49	40.96
2	“Heavy” recyclables + weekly residuals	204	8.49	44.61
2b	“Heavy” recyclables + weekly residuals, food waste separate	216	8.66	47.18
3a	Maximum recycling + alternate week residuals	230	9.57	50.29
1b	Max. biodegradables + weekly residuals, food waste separate	244	10.16	53.13
3	Maximum recycling + weekly residuals	244	10.15	53.34
3b	Maximum recycling + weekly residual, food waste separate	259	10.78	56.14

Table 4.3.2 - NPV of collection options excluding MRF costs:

Option		NPV £M		
		NPV £M	pa	NPV £/t
2a	“Heavy” recyclables + alternate week residuals	135	5.42	29.65
1a	Maximum biodegradable + alternate week residuals	145	5.78	31.64
3a	Maximum recycling + alternate week residuals	174	7.24	38.03
1	Maximum biodegradable + weekly residuals	176	7.04	38.53
2	“Heavy” recyclables + weekly residuals	178	7.11	38.93
3	Maximum recycling + weekly residual	185	7.70	40.45
2b	“Heavy” recyclables + weekly residuals, food waste separate	199	7.95	43.32
3b	Maximum recycling + weekly residual, food waste separate	208	8.68	45.39
1b	Max. biodegradables + weekly residuals, food waste separate	233	9.69	50.70

As can be seen, the collection options with maximum recycling (3, 3a,3b) tend to be more expensive than those with less recycling. Scenario a in which residuals are collected fortnightly lowers costs, while collecting the food waste separately from the garden waste in scenario b) gives high costs in each option. Overall the lowest costs were achieved in scenario 2a collecting paper and glass weekly and residuals on alternate weeks.

Residual Disposal Technologies

The Jacobs Babbie assessment considered the NPV of each of the twelve original disposal options. However, Jacobs Babbie were unable to access costing data for option 1e - MBT with an output stabilised for landfilling - and the Council has used the Organic Resource Agency (ORA) to supply information on this option. The Organic Resource Agency information is in Appendix E. As with the technical evaluation, three scenarios were modelled:

- For meeting the LATS targets with a 10% buffer, the **Meet Targets** scenario; (these are marked with an “M”)

- For exceeding the LATS targets (processing the maximum amount of waste that the facilities can accommodate), the **Exceed Targets Scenario** (these are marked with an “E”); and
- Doing the minimum necessary to halt any deterioration in current service. This assumes zero technology and a dependence on the buying permits, the **Do Minimum** scenario.

A comparison of NPVs for the twelve technology options modelled is presented in the figure Table 4.3.3 that follows. It can be seen that the lowest cost solution is EfW, followed by ATT. And that after this, the **Do Minimum** scenario, where it is assumed that landfill allowance permits will be purchased from other authorities is lower cost than the remaining technologies. This scenario has considered permits trading at £30 per tonne. At the time of writing permits are currently trading around £20/tonne, but are expected to rise nearer to the first Landfill Directive Target date of 2010.

The ORA report on certain MBT technologies has considered three options: an MBT plant which stabilises that output for landfilling (1e); biodrying in a scenario similar to option 1c, and an AD option similar to 2b but with much greater recovery of recyclables at the front end of the process. The investment and operational costs for these three options have been costed as follows in Table 4.3.4. which follows. However, these costs do not include the additional costs of landfill, or revenues and cannot therefore be considered on quite the same basis as the Jacobs Babbie data.

It is likely that if the stabilised MBT “1e” option were costed on the same basis it would come out around £41.76/tonne.

Table 4.3.3 A comparison of NPVs for all Meet and Exceed LATS Target options against the Do Minimum option

		TECHNOLOGY OPTION	NPV £M	NPV £M pa	NPV £/tonne
11	E4	EfW	130	5.4	29.56
23	M4	EfW	143	6.0	32.51
9	E3a	ATT	153	6.4	34.67
21	M3a	ATT	160	6.6	36.24
1	DO-MIN	NONE	170	7.1	38.65
10	E3b	ATT (Multi)	172	7.1	38.97
7	E2b	MT + AD + Lf	177	7.4	40.28
22	M3b	ATT (Multi)	181	7.5	41.06
5	E1d	MBT + IVC + RDF to 3rd party	182	7.6	41.35
12	E5a	AC + ATT	189	7.9	43.01
3	E1b	MBT + FBG + IVC	190	7.9	43.24
24	M5a	AC + ATT	190	7.9	43.26
2	E1a	MBT + ATT + IVC	192	8.0	43.67
16	M1c	MBT + IVC + Lf	193	8.0	43.81
4	E1c	MBT + IVC + Lf	193	8.1	43.90
25	M5b	AC + Lf	200	8.3	45.51
13	E5b	AC + Lf	200	8.4	45.53
17	M1d	MBT + IVC + RDF to 3rd party	201	8.4	45.65
15	M1b	MBT + FBG + IVC	207	8.6	46.99
8	E2c	MT + AD + RDF to 3rd party	208	8.7	47.26
19	M2b	MT + AD + Lf	209	8.7	47.46
18	M2a	MT + ATT + AD	213	8.9	48.33
6	E2a	MT + ATT + AD	214	8.9	48.53
14	M1a	MBT + ATT + IVC	232	9.7	52.71
20	M2c	MT + AD + RDF to 3rd party	235	9.8	53.42

Table 4.3.4 - ORA Report – costings of certain MBT plants

	Stabilised in composting process and landfilled	Biodried and landfilled	AD option with very high level of front end recycling
Investment and Operational costs per tonne	31.10	32.70	62.2

Chapter 4.4

Disposal/treatment options – Risks

Without considering criteria beyond cost and performance it will prove to be very difficult to determine the most suitable disposal/treatment. There are a series of risks that need to be considered which apply to each component of every technological arrangement. Typically the following risks (though not exhaustive) should be considered:

Design Risk	Construction Risk	Planning Risk	Operational Risk
Residual Value Risk	Financial Risk	Performance Risk	Demand Risk
Technology Risk	Regulatory Risk	Taxation Risk	Insurance Risk

Although some of these risks have been considered i.e. performance risk, several others will need to be considered in order to make an informed decision.

A series of risk flow diagrams have been produced for each of the original 12 treatment/disposal options by Jacobs Babbie and these are part of Appendix D. A summary of the main risks in procuring disposal/treatment options has been summarised in Table 4.4.1 that follows. Each of the twelve disposal options have been rated against that risk. In selecting a technology, the Council must be aware of these risks and apply appropriate risk management.

Table 4.4.1 - Main risks associated with procurement of waste treatment / disposal facilities at pre-preferred bidder stage

Market Interest Risk	The risk of attracting suitable bidders – is the tender attractive to the market?
Supplier Robustness i.e. financial risk	The risk that the supplier has a good track record and experience with the technologies and the waste streams to be processed. Do they have suitable financial backing/ provision? The risk that the Contractor fails to raise sufficient finance to deliver the project or the cost of finance is higher or lower than predicted.
Technology Risk	The risk of unexpected change in the technology employed, which leads to reconfiguration or obsolescence of existing assets.
Input Specification	The risk of whether the technology is flexible enough to cope with changes in waste composition, waste quantity, and waste quality. Is equipment down time for any reconfiguration minimised?
ABPR compliance	Compostable material derived from processing non-source segregated organic waste, any kitchen waste collected, and/or any green waste collected at source that is mixed with kitchen waste must be processed through an ABPR compliant process. Difficult and lengthy process to demonstrate compliance with the EA and obtain relevant permits/ license.
End Market Risk	The risk that material quality, fluctuation in market price, and fluctuation in market demand affect revenue, and force material to be landfilled.
Performance Risk	The risk that the Contractor fails to meet its performance targets and Council targets are therefore missed as a result.
Operational Risk	The risk that operating costs are higher or even lower than forecast
Planning Risk	The risk that the Contractor fails to achieve planning approval which results in a failure to achieve contract targets for recycling, increased costs or a failure to deliver facilities to the agreed timetable

Each technology option is considered in detail and assigned a risk rating based on a simple 3 by 3 risk matrix that is outlined below.

Table 4.4.2 - Risk Matrix

IMPACT	High	Significant	Critical	Unacceptable
	Medium	Insignificant	Significant	Critical
	Low	Acceptable	Insignificant	Significant
		Low	Medium	High
		PROBABILITY		

The summary risk tables for each element of each treatment/disposal technology option are provided below. They apply the five risk assessment options outlined in the risk matrix above and detail 'N/A' where an assessment of risk is not applicable.

1a: MBT + ATT + IVC	MBT	ATT	IVC
Market Interest Risk	Significant	Significant	Acceptable
Supplier Robustness/ financial risk	Critical	Critical	Acceptable
Technology Risk	Critical	Significant	Acceptable
Input Specification	Critical	Significant	Critical
ABPR compliance	n/a	n/a	Critical
End Market Risk	Significant	Insignificant	Critical
Performance Risk	Insignificant	Insignificant	Significant
Operational Risk	Significant	Significant	Significant
Planning Risk	Significant	Critical	Significant

1b: MBT + EFW/FBG + IVC	MBT	FBG	IVC
Market Interest Risk	Significant	Insignificant	Acceptable
Supplier Robustness/ financial risk	Critical	Insignificant	Acceptable
Technology Risk	Critical	Insignificant	Acceptable
Input Specification	Critical	Significant	Critical
ABPR compliance	n/a	n/a	Critical
End Market Risk	Significant	Insignificant	Critical
Performance Risk	Insignificant	Insignificant	Significant
Operational Risk	Significant	Significant	Significant
Planning Risk	Significant	Critical	Significant

1c: MBT + IVC + Lf	MBT	IVC	Lf
Market Interest Risk	Significant	Acceptable	Insignificant
Supplier Robustness/ financial risk	Critical	Acceptable	Insignificant
Technology Risk	Critical	Acceptable	Acceptable
Input Specification	Critical	Critical	Acceptable
ABPR compliance	n/a	Critical	n/a
End Market Risk	Significant	Critical	n/a
Performance Risk	Insignificant	Significant	Significant
Operational Risk	Significant	Significant	Insignificant
Planning Risk	Significant	Significant	Critical

1d: MBT + IVC + RDF to 3rd party	MBT	IVC	RDF to 3rd party
Market Interest Risk	Significant	Acceptable	Critical
Supplier Robustness/ financial risk	Critical	Acceptable	Significant
Technology Risk	Critical	Acceptable	Significant
Input Specification	Critical	Critical	Insignificant
ABPR compliance	n/a	Critical	n/a
End Market Risk	Significant	Critical	Acceptable
Performance Risk	Insignificant	Significant	Insignificant
Operational Risk	Significant	Significant	Significant
Planning Risk	Significant	Significant	n/a

2a: MT + ATT + AD	MT	ATT	AD
Market Interest Risk	Significant	Significant	Significant
Supplier Robustness/ financial risk	Significant	Critical	Significant
Technology Risk	Insignificant	Significant	Insignificant
Input Specification	Insignificant	Significant	Critical
ABPR compliance	n/a	n/a	Significant
End Market Risk	Critical	Insignificant	Critical
Performance Risk	Significant	Insignificant	Critical
Operational Risk	Significant	Significant	Significant
Planning Risk	Significant	Critical	Significant

2b: MT + AD + Lf	MT	AD	Lf
Market Interest Risk	Significant	Significant	Insignificant
Supplier Robustness/ financial risk	Significant	Significant	Insignificant
Technology Risk	Insignificant	Insignificant	Acceptable
Input Specification	Insignificant	Critical	Acceptable
ABPR compliance	n/a	Significant	n/a
End Market Risk	Critical	Critical	n/a
Performance Risk	Significant	Critical	Significant
Operational Risk	Significant	Significant	Insignificant
Planning Risk	Significant	Significant	Critical

2c: MT + AD + RDF to 3rd party	MT	AD	RDF to 3rd party
Market Interest Risk	Significant	Significant	Critical
Supplier Robustness/ financial risk	Significant	Significant	Significant
Technology Risk	Insignificant	Insignificant	Significant
Input Specification	Insignificant	Critical	Insignificant
ABPR compliance	n/a	Significant	n/a
End Market Risk	Critical	Critical	Acceptable
Performance Risk	Significant	Critical	Insignificant
Operational Risk	Significant	Significant	Significant
Planning Risk	Significant	Significant	n/a

3a: ATT	ATT
Market Interest Risk	Significant
Supplier Robustness/ financial risk	Significant
Technology Risk	Significant
Input Specification	Insignificant
ABPR compliance	n/a
End Market Risk	Insignificant
Performance Risk	Significant
Operational Risk	Significant
Planning Risk	Critical

3b: ATT (Multi)	ATT (Multi)
Market Interest Risk	Significant
Supplier Robustness/ financial risk	Critical
Technology Risk	Significant
Input Specification	Insignificant
ABPR compliance	n/a
End Market Risk	Insignificant
Performance Risk	Significant
Operational Risk	Critical
Planning Risk	Critical

4: EfW	EfW
Market Interest Risk	Acceptable
Supplier Robustness/ financial risk	Acceptable
Technology Risk	Acceptable
Input Specification	Acceptable
ABPR compliance	n/a
End Market Risk	Insignificant
Performance Risk	Insignificant
Operational Risk	Insignificant
Planning Risk	Critical

5a: AC + ATT	AC	ATT
Market Interest Risk	Critical	Significant
Supplier Robustness/ financial risk	Critical	Critical
Technology Risk	Critical	Significant
Input Specification	Significant	Significant
ABPR compliance	n/a	n/a
End Market Risk	Critical	Insignificant
Performance Risk	Critical	Insignificant
Operational Risk	Critical	Significant
Planning Risk	Significant	Critical

5b: Ac + Lf	AC	Lf
Market Interest Risk	Critical	Insignificant
Supplier Robustness/ financial risk	Critical	Insignificant
Technology Risk	Critical	Acceptable
Input Specification	Significant	Acceptable
ABPR compliance	n/a	n/a
End Market Risk	Critical	n/a
Performance Risk	Critical	Significant
Operational Risk	Critical	Insignificant
Planning Risk	Significant	Critical

Chapter 4.5

Best Practicable Environmental Option (BPEO)

What is a BPEO?

The concept of Best Practical Environmental Option was first introduced by the Royal Commission on Environmental Pollution in their 12th report. It was defined as “a systematic and consultative decision making procedure, which emphasises the protection and conservation of the environment”. The procedure ensures that not only are the costs of options evaluated, but also that environmental and social impacts are considered when determining what is the “best option”.

Using the BPEO tool provides decision makers with a clear and rational approach to evaluating the relative merits of any set of given options. Through this approach, options to manage waste can be assessed not only against their performance with respect to Statutory Targets and cost, but also with regard to the environmental burdens and social impacts of each option. The Governments’ Waste Strategy 2000 placed BPEO at the centre of decision making for waste management.

Why has the Council undertaken a BPEO?

Prior to the procurement of a contract to manage and treat residual waste, a Waste Disposal Authority should first develop a waste management strategy identifying a choice of options, the process of evaluation and the outcomes of that evaluation. This strategy then acts as a benchmark, both informing the waste management industry of the type of service the Authority is seeking, and against which future tenders can be evaluated. Milton Keynes Council, as a Waste Collection and Disposal Authority, is in the process of developing a Waste Management Strategy. Part of this process is to identify and then evaluate the options.

As part of this process the Council has, in discussion with external consultants, derived 9 collection options and 13 residual treatment options. These options have been modelled to derive data on performance against targets, the environment and cost. The data alone does not comprise an evaluation, and, following Waste Strategy 2000 recommendations, the Council has evaluated the data within the BPEO framework.

ODPM Guidelines

Although BPEO is a tool designed to aid Waste Management Strategy development, it also has uses in the planning process. Its application in the planning process has however led to inconsistency and caused confusion in

terms of the approaches adopted and the range of issues considered. To address this, the Office of the Deputy Prime Minister (ODPM) issued guidance on BPEO assessments.

The ODPM guidance proposed the following approach:

- Identifying and Agreeing Appraisal Criteria;
- Developing Strategic Waste Planning Options;
- Data Collection;
- Appraising Strategic Waste Planning Options;
- Ranking and Valuing Performance;
- Weighting Indicators.

The collection and disposal options are defined in Chapters 4.1-4.3 of this document. These chapters also present data such as recycling and composting levels, performance against landfill diversion and cost. Additional data on environmental performance was required, and to obtain this data the Environment Agency's Life Cycle Assessment Tool WISARD was used.

Please note that the requirement to undertake a BPEO was in place at the time that these studies were undertaken (December/January and June 2005). In July 2005, new guidance was issued from DEFRA and the ODPM indicating that a BPEO will not be required in the future and that a Strategic Environmental Assessment (SEA) should be carried out instead as part of the municipal waste management strategy and waste development plan process.

LCA & WISARD

WISARD (Waste: Integrated Systems Analysis for Recovery and Disposal) is a waste management software tool developed for the Environment Agency.

The software employs a life cycle assessment (LCA) approach to forecasting the potential environmental impacts associated with the waste management options. The software can address potential impacts stemming from all stages in the management and processing of waste, including waste collection, transport, treatment and disposal activities. Impacts considered include the direct emissions from management activities themselves (e.g. transport, composting, incineration, landfill etc.), those associated with the provision of infrastructure (e.g. bins, vehicles, construction of facilities etc.) and the avoided impacts associated with materials and energy recovery (e.g. offset virgin metal production or electricity generation from coal).

WISARD utilises the "avoided burden" methodology for calculating environmental burdens. It incorporates into the assessment the avoided environmental impacts of an activity or process not having to take place. For example, recycling of steel cans avoids the requirement to smelt additional iron. Thus credits are allocated to recycling activities by calculating the energy and raw materials associated with the production of that product. Credits are also assigned to those options that generate power, as this energy production is offset against the requirement for fossil fuels (primarily coal for electricity

generation). Impacts of mining activities are included in the assessment of burdens and avoided burdens.

This WISARD software is a complex model, however the real world is infinitely more complex and sophisticated. Thus the simplification within WISARD will mean that the model has limitations in its use and application. However by ensuring that the reader is aware of these limitations the subsequent data can be evaluated within the context of these known limitations. Information pertaining to the limitations of WISARD and its application to this evaluation are provided in the Entec Report in Appendix F.

The Waste Forum

The ODPM guidance suggests that where possible elected members should agree objectives and indicators. For the Milton Keynes BPEO assessment this was achieved by consulting with the Waste Forum. Two meetings were held. The first was used to discuss and determine the appraisal criteria. Full details of the process can be found in Entec Report in Appendix F. Through a discussion and voting process the Forum determined upon the following 11 indicators to be used in the BPEO exercise:

- Resource depletion;
- Emissions of greenhouse gases;
- Emissions injurious to public health;
- Eutrophication*;
- Extent of water pollution;
- Overall costs & Best Value;
- Likelihood of implementation within required timescales;
- Percentage of material recovery;
- Reliability of technology;
- Minimise hazardous discharge to land;
- Ability to cope with change

*Eutrophication is a natural process, occurring where there is an increase of mineral and organic nutrients in a water body (principally nitrogen and phosphorous). The enrichment promotes both plant growth and microbial activity that, providing an unlimited nutrient supply, eventually results in the de-oxygenation of the water body. De-oxygenation of a water body results in fish kills and an alteration to the ecology of the system. Effluent discharges contain many nutrients and require careful monitoring to ensure a water system is not over-loaded.

The second Waste Forum meeting discussed the weighting processes. Without weightings all the indicators are of equal importance. In practice though, decision makers attach more importance to certain indicators than to others. The relative importance of the indicators can be reflected through applying “weightings”. Further detail on this part of the process, and how the weightings were derived is available in Appendix F. The final weightings were as follows:

Table 4.5.1 - Weightings used in the BPEO

Indicator	Weighting (%)
Resource Depletion	8.74
Percentage of Material Recycled/Composted	8.74
Emission of Greenhouse Gases	10.12
Eutrophication	2.76
Extent of Water Pollution	3.68
Percentage of Material Recovery	5.98
Minimise Hazardous Discharge to Land	5.98
Overall costs and best value	12.3
Likelihood of implementation within required timescales	9.7
Reliability of technology	11.4
Ability to cope with change	10.6
Emissions injurious to public health	10.0

BPEO Evaluation

The collection and disposal options were evaluated separately. The first assessment was for 12 residual treatment /disposal options. This study was completed by Entec following the work carried out by Jacobs Babbie in November 2004-February 2005 on those options. The collection options and residual treatment/disposal option “1e” were carried out in July 2005 following Jacob Babbie’s work on the same subject.

The derivation of the indicators, as detailed above and presented in greater detail in Appendix F, was therefore undertaken for the first 12 residual treatment options. The same indicators and weighting have been used for evaluation of the collection options and option 1e. However, some indicators are not relevant to collection options. These are as follows:

- Percentage of material recovered: recovery is part of the disposal options and would be dependant upon which disposal option is adopted post collection
- Minimise hazardous discharge to land: related to the landfilling of Air Pollution Control residues from thermal treatment processes. Therefore this indicator was not applicable to evaluation of collection options
- Likelihood of implementation within required timescales: unlike the residual treatment options there is no significant time lag between collection option selection and full implementation, and as all options require the use of a MRF, all the options would have the same implementation timeframe

- Reliability of technology: the options include the use of various levels of automation within the MRF. However Milton Keynes Council have experience of complex MRF technology and found this to be no less reliable than their previous experience of less complex MRF's. All collection options would therefore be as reliable as each other
- Ability to cope with change: this indicator mainly referred to the long time frame of residual treatment options (contract time of 25 years) and the level of flexibility that technologies have in adapting to possible changes with respect to waste generation. Collection contracts are generally over much shorter time frames and within any 25 year disposal period the collection fleet would be renewed no less than three times. This in itself brings an element of flexibility into collection options. It was agreed that changes would affect all collection options equally.

Where collection options were equal with respect to an indicator all options scored zero. This removed the requirement to re-examine the weightings.

Scoring & Weighting

Once the indicators had been assessed, a scoring mechanism was required that would enable the relative difference between option performances to be retained for each indicator, whilst allowing the performance of the options against all indicators to be put on a common scale. Details of the scoring exercise are given in Chapter 5.3 of the Entec Report in Appendix F.

The weighted score is calculated by multiplying the performance score by the weighting (in terms of percentage, i.e. a 10% weighting means multiplying by 0.1).

		Option 1	Option 2	Option 3	Option 1a	Option 2a	Option 3a	Option 1b	Option 2b	Option 3b
Min Haz discharge to land	Score	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Overall cost & Best Value	Score	0.732	0.542	0.164	0.995	1.000	0.302	0.274	0.437	0.000
		0.090	0.067	0.020	0.122	0.123	0.037	0.034	0.054	0.000
Likelihood of delivery within timescales	Score	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Reliability of technology	Score	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ability to cope with change	Score	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Emissions injurious to public health	Score	0.000	0.397	0.708	0.233	0.508	1.000	0.071	0.306	0.567
		0.000	0.040	0.071	0.023	0.051	0.100	0.007	0.031	0.057
Total weighted score		0.139	0.224	0.388	0.221	0.320	0.465	0.063	0.170	0.301

Table 4.5.3 - Ranked Collection Options:

Option	Weighted Score	Rank
Option 3a	0.465	1
Option 3	0.388	2
Option 2a	0.320	3
Option 3b	0.301	4
Option 1a	0.221	5
Option 2	0.224	6
Option 2b	0.170	7
Option 1	0.139	8
Option 1b	0.063	9

A number of assumptions have been used in this assessment. These assumptions are necessary to enable the completion of the assessment, and an indicative ranking to be formed. However the rankings should not be taken to sanction a particular option. They should be seen as a way of identifying the more favorable options. The less favorable options can be eliminated, and the more favorable options should be evaluated in greater detail.

Options which maximize the collection of dry recyclables (Option 3, 3a and 3b) perform well, all appearing in the top four.

On this basis Entec recommend the Council further investigate the practicalities of delivering a maximised dry recyclables collection.

Table 4.5.4 - Results from Residual Treatment Option Appraisal

		Option 1a	Option 1b	Option 1c	Option 1d	Option 1e	Option 2a	Option 2b	Option 2c	Option 3	Option 4	Option 5a	Option 5b
Resource Depletion	Score	0.574	0.574	0.626	1.000	0.456	0.596	0.633	0.961	0.607	0.000	0.722	0.711
Weighting: 0.0874	Weighted score	0.0502	0.0502	0.0547	0.0874	0.0398	0.0521	0.0553	0.0840	0.0531	0.0000	0.0631	0.0622
% Material Recycled /Composted	Score	0.323	0.323	0.323	0.323	1.000	0.094	0.094	0.094	0.097	0.000	0.339	0.339
Weighting: 0.0874	Weighted score	0.0283	0.0283	0.0283	0.0283	0.0874	0.0082	0.0082	0.0082	0.0085	0.0000	0.0296	0.0296
Emission Greenhouse gasses	Score	0.781	0.781	0.113	0.619	0.508	0.939	0.373	0.786	0.482	0.477	1.000	0.000
Weighting: 0.1012	Weighted score	0.0790	0.0790	0.0114	0.0627	0.0514	0.0950	0.0378	0.0795	0.0488	0.0483	0.1012	0.0000
Europhication	Score	0.558	0.558	0.485	0.440	0.494	0.106	0.047	0.000	0.559	0.563	1.000	0.924
Weighting: 0.0276	Weighted score	0.0154	0.0154	0.0134	0.0121	0.0136	0.0029	0.0013	0.0000	0.0154	0.0155	0.0276	0.0255
Extent of Water Polln	Score	0.583	0.583	0.500	1.000	0.667	0.194	0.611	0.417	0.694	0.444	0.000	0.083
Weighting: 0.0368	Weighted score	0.0215	0.0215	0.0184	0.0368	0.0245	0.0072	0.0225	0.0153	0.0256	0.0164	0.0000	0.0031
% Material Recovery	Score	0.488	0.488	0.000	0.488	0.000	0.610	0.610	0.610	0.854	1.000	0.686	0.000
Weighting: 0.0598	Weighted score	0.0292	0.0292	0.0000	0.0292	0.0000	0.0365	0.0365	0.0365	0.0511	0.0598	0.0411	0.0000
Min Haz discharge to land	Score	0.512	0.512	1.000	0.512	1.000	0.633	1.000	0.633	0.145	0.000	0.313	1.000

		Option 1a	Option 1b	Option 1c	Option 1d	Option 1e	Option 2a	Option 2b	Option 2c	Option 3	Option 4	Option 5a	Option 5b
Weighting: 0.0598	Weighted score	0.0306	0.0306	0.0598	0.0306	0.0598	0.0379	0.0598	0.0379	0.0087	0.0000	0.0187	0.0598
Overall cost & Best Value	Score	0.256	0.279	0.244	0.378	0.391	0.000	0.435	0.062	0.731	1.000	0.291	0.158
Weighting: 0.1230	Weighted score	0.0315	0.0343	0.0300	0.0466	0.0480	0.0000	0.0535	0.0076	0.0899	0.1230	0.0358	0.0195
Likelihood of delivery within timescales	Score	0.333	0.333	1.000	0.333	0.889	0.333	0.778	0.333	0.111	0.778	0.111	1.000
Weighting: 0.097	Weighted score	0.0323	0.0323	0.0970	0.0323	0.0862	0.0323	0.0754	0.0323	0.0108	0.0754	0.0108	0.0970
Reliability of technology	Score	0.000	0.111	0.889	0.444	0.778	0.000	0.556	0.444	0.000	1.000	0.000	0.222
Weighting: 0.114	Weighted score	0.0000	0.0127	0.1013	0.0507	0.0887	0.0000	0.0633	0.0507	0.0000	0.1140	0.0000	0.0253
Ability to cope with change	Score	0.143	0.143	0.857	0.857	0.857	0.143	0.429	0.714	0.143	0.429	0.143	1.000
Weighting: 0.106	Weighted score	0.0151	0.0151	0.0909	0.0909	0.0909	0.0151	0.0454	0.0757	0.0151	0.0454	0.0151	0.1060
Emissions injurious to public health	Score	0.256	0.256	0.654	0.350	0.530	0.572	0.855	0.589	0.099	0.000	0.412	1.000
Weighting: 0.1000	Weighted score	0.0256	0.0256	0.0654	0.0350	0.0530	0.0572	0.0855	0.0589	0.0099	0.0000	0.0412	0.1000
Total weighted score		0.359	0.374	0.571	0.542	0.643	0.344	0.545	0.487	0.337	0.498	0.384	0.528

* The costings for Option 1e were provided by different consultants. These consultants costed two options, one to provide a ratio effect to allow Option 1e to be more realistically compared. Full details of this are provided in Appendix E.

Table 4.5.5 - Ranked Disposal Options

Option	Technology Option as described In Options Appraisal Report	Weighted Score	Rank
Scenario 1e	MBT + IVC (LATS Compliance) + Lf	0.643	1
Scenario 1c	MBT + IVC + Lf (of RDF Fraction)	0.571	2
Scenario 2b	MT + AD + Lf	0.545	3
Scenario 1d	MBT + IVC +RDF (to 3 rd party)	0.542	4
Scenario 5b	AC + Lf	0.528	5
Scenario 4	EFW	0.498	6
Scenario 2c	MT +AD + RDF (to 3 rd party)	0.487	7
Scenario 5a	AC + ATT	0.384	8
Scenario 1b	MBT + FBG +IVC	0.374	9
Scenario 1a	MBT + ATT + IVC	0.359	10
Scenario 2a	MT + ATT + AD	0.344	11
Scenario 3	Screening and ATT	0.337	12

Following on from the BPEO assessment is a Council requirement to employ a technological solution that will enable them to comply with their Landfill Allowance Trading Scheme (LATS) permit allocation. In this respect a pass/fail has been applied on this issue. Options 1c, 2b and 5b fail to comply with LATS.

Using this pass /fail criterion amends the final result are as follows:

Table 4.5.6 - Ranking of disposal options which comply with LATS

Option	Technology Option as described In Options Appraisal Report	Weighted Score	Rank
Scenario 1e	MBT + IVC (LATS Compliance) + Lf	0.643	1
Scenario 1d	MBT + IVC +RDF (to 3 rd party)	0.542	2
Scenario 4	EFW	0.498	3
Scenario 2c	MT +AD + RDF (to 3 rd party)	0.487	4
Scenario 5a	AC + ATT	0.384	5
Scenario 1b	MBT + FBG +IVC	0.374	6
Scenario 1a	MBT + ATT + IVC	0.359	7
Scenario 2a	MT + ATT + AD	0.344	8
Scenario 3	Screening and ATT	0.337	9
Scenario 1c	MBT + IVC + Lf (of RDF Fraction)	0.571	
Scenario 2b	MT + AD + Lf	0.545	
Scenario 5b	AC + Lf	0.528	

Again, Entec would warn that a number of assumptions have been used in this assessment and that the rankings should not be taken to sanction a particular option; rather their relative positions should identify a need to the Council to evaluate some schemes in greater detail, while others can be removed from consideration.

It should also be noted that in the options where the RDF is sent to a third party (e.g. a cement kiln) the environmental and financial costs of building that establishment (in all respects) have not been accounted for in the calculation because they are assumed to already be in place. For this reason, these options score better than their counterparts that have to be built.

Options 1e and 1d, both MBT's score well. The two options represent different MBT technologies, Option 1e is focused on producing a LATS compliant stabilate that is sent to landfill, while Option 1d is primarily a biodrying process that maximises the production of an RDF for a third party.

The next two options, Options 4 and 2c have close scores and both include combustion. Conventional combustion (direct combustion) features in four of the top five options, while the ATT treatment options are all at the lower end of the table.

It is recommended by Entec that the top performing technologies (MBT and conventional combustion) are further evaluated, including open, informed discussions between Officers, Members and the public.

FEEDBACK FROM THE CONSULTATION ON COLLECTION AND DISPOSAL OPTIONS

Collection Options

The short survey asked whether respondents would be willing to separate out all their food waste for recycling. There was strong support for this with 73.1% saying that they would. Residents would appear to prefer a small enclosed bucket to be able to do this (55.5%) but it should be emphasised that the alternative of a small wheeled bin for mixed food and garden waste was not thoroughly discussed in this survey.

As discussed in chapter 2.6, there remains support for sacks for collection of residual refuse, though around one third of residents would prefer a wheeled bin, and many have made comments to that effect. The CAGOW also thought that wheeled bins would be preferred.

All other methods of current containment for recyclables and garden waste are preferred, and should therefore be continued.

Regarding the 9 collection options discussed in the previous chapters, these were addressed by respondents to the technical survey. The strongest support was for options 3a and 3 which have maximum recycling. The strongest support was for option 3a in which recyclables are collected on alternate weeks. However, CAGOW were of the opinion that alternate week collections would cause confusion and be unpopular. Opinions on whether

garden waste should be collected separately from food waste and whether the garden waste collection should be free were divided and not strongly conclusive.

Options 3a and 3 are some of the most expensive collection options. However, little comment was made about this.

Treatment and Disposal Options

In the short survey, respondents selected the five most important of 16 possible criteria when selecting residual treatment technologies. The top five were:

Reduces pollution as much as possible (72.9%)

Reduces rubbish for landfilling (62.1%)

Generates electricity from rubbish (48.7%)

Reduces climate change as much as possible (41.9%)

Includes extra recycling (36.0%)

“Costs as little as possible” ranked 11th, with only 20.5% supporting this.

As discussed in previous chapters, while there is strong support for the “no incineration” policy, residents have mixed views about what this means and are unsure about the safety of incinerators. This is perhaps reflected in the importance given to generating electricity, which is most likely to be related to some form of thermal treatment.

The CAGOW were of the opinion that thermal treatments should be evaluated as part of the waste management mix.

The most favoured option amongst respondents to the technical survey was option “1e” – MBT which stabilised waste before landfilling, and was a non-thermal option. Again there was little discussion of cost – option 1e is not the least cost option; it also only just meets landfill allowances, with little margin.

Chapter 4.6

Health Impacts of Waste Management Options – A Review

This chapter comprises a brief summary of a review by the Environmental Protection Team, Environmental Health Division at Milton Keynes Council, July 2005 available in full, with a peer review on Milton Keynes Council's website at www.mkweb.co.uk/waste

The most recent research

A recent detailed report published by DEFRA (Enviros et al. 2004, "the DEFRA report") concluded that on the evidence of scientific studies so far, Municipal Solid Waste (MSW) disposal has "at most a minor effect on human health and the environment"

Scope of this report

This report covers the following treatment processes where data is available:

1. Biological processes
 - Open Windrow Composting
 - In-vessel composting (IVC)
 - Anaerobic Digestion (AD)
2. Thermal processes
 - Incineration with energy recovery
 - Advanced Thermal Treatment (ATT):there is currently only one UK ATT MSW process using a combination of gasification and pyrolysis
3. Mechanical-hybrid processes
 - Mechanical biological treatment (MBT)
 - Mechanical heat treatment (MHT or autoclaving)
4. Landfill

Emissions from MSW treatment

Emissions to water

Emissions to water are associated with landfilling and, to a lesser extent composting. Some other processes use and discharge water. These emissions make up about 0.25% of total UK emissions to water.

Emissions to air (Table 4.6.1)

With the exception of methane and cadmium (Cd) less than 2.5% of total UK emissions to air come from MSW management. However, 27 % of UK emissions of methane and 10% of emissions of Cd comes from MSW, in both cases very largely from landfill sites.

Overall PAH (polycyclic aromatic hydrocarbon) emissions from MSW treatment are rather less than 3% of total national emissions to air (data from Dore et al. 2004), the available data suggests emissions from incineration are unlikely to be significant. Road traffic will have a more significant effect on local levels of PAH than a MSW incinerator.

Data on metal emissions is mainly for incineration and landfill. Taken together metal emissions from incineration and landfill as a percentage of total national emissions amount to about 0.1% for As (arsenic), 10% for Cd, 1.65% for Hg (mercury) and 0.2% for Ni (nickel) (data from Dore et al. 2004; Enviro et al. 2004).

Emissions of particulate matter (PM)

All MSW treatment techniques are capable of generating particulate emissions. The available information suggests composting processes give out most particulate matter followed by incineration.

Emissions of bioaerosols

The main biological hazard associated with MSW treatment is related to the formation of bioaerosols (organic dust). These are airborne particles comprising large molecules or volatile compounds that are living or contain living organisms or were released from living organisms. Bioaerosols are considered to be the emission of most concern from all types of composting site and there are also significant emissions from MBT sites.

There is no information available, which enables emissions from composting (other than particulate matter), MBT or anaerobic digestion to be properly quantified.

Emissions to land

This is an area where more research on possible emissions, particularly from composting, MBT and AD of MSW, is urgently required.

Conclusions about emissions

It is emissions to air that have the greatest potential for impact on health, as any impact would be more direct than impacts via water or solid materials. Whilst there is some good evidence about emissions to air, there are still gaps in our knowledge particularly about composting, mechanical biological treatment and anaerobic digestion (see Table 4.6.1).

However, with two exceptions (methane and Cd, both mainly from landfill) emissions to air from MSW treatment amount to only 2.5% of total UK emissions. Emissions to water from MSW treatment are negligible, making up only 0.25% of the UK total. Emissions to land and in solid form are rather more difficult to assess.

Table 4.6.1. - Emissions to air from specific techniques in weight per tonne MSW treated (grammes except where indicated otherwise)							
	Cm	AD	In	TT	MB	Lf	Tr
Methane (CH₄)	Y	Y	19	Y	411	20kg	N
Carbon dioxide (CO₂)	Y	N	1 Mg	N	Y	0.3 Mg	Y
Nitrogen oxides (NO_x)	N	188	1.6kg	780	72.3	680	31
Sulphur oxides (SO_x)	N	3	42	52	28	53	0.11
Halides of hydrogen (HCl, HF)	N	<0.02	59	32.3	1.6	6	N
Non-methane VOCs	Y	Y	8	11	36	23	5.1
Dioxins & furans (ng TEQ)	N	N	400	48	40	140	0.04
Arsenic (As) mg	N	<0.5	5	60	?	1.2	?
Cadmium (Cd) mg	N	<0.1	5	6.9	?	71	?
Mercury (Hg) mg	N	<0.6	50	6.9	?	1.2	?
Nickel (Ni) mg	N	<0.3	50	40	?	9.5	?
Particulate matter PM	175	Y	38	12	Y	5.3	1.3
Polycyclic aromatic hydrocarbons	?	?	N	?	?	?	Y
Bioaerosols	Y	Y	N	N	Y	Y	N

Cm Windrow composting; **AD** Anaerobic Digestion; **In** Incineration; **TT** Advanced Thermal Treatment (pyrolysis/gasification); **MB** Mechanical Biological Treatment; **Lf** Landfill 25% of emissions as fugitive gases 75% from gas engines; **Tr** Waste related transport.
VOC volatile organic compounds; **?** no data; **N** not likely to be emitted in significant amounts; **Y** likely to be emitted unquantified. **Mg** megagramme, 1 million grammes; **kg** kilogramme, one thousand grammes; **mg** milligramme one thousandth of a gramme; **ng** nanogramme one thousandth of one millionth of a gramme. **TEQ** expressed as a concentration equivalent to the most toxic dioxin – 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).

Results of research on potential health effects

Studies on landfill sites

There is one recent study that shows a consistent statistical relationship between living near MSW landfill sites and adverse health effects (Elliot et al. 2001). There are serious problems with interpreting the results of studies of this type. The authors of this report are quite clear that there is no direct evidence of any cause and effect relationship between the identified health effects and living near a landfill site.

The recent DEFRA report says, "we found that the weight of evidence is against any increased incidence of cancers in people living near to landfill sites".

Studies on Incinerators

Most published studies of incinerators concentrate on the older generation of incinerators, which were phased out in the UK after the Integrated Pollution Prevention and Control (IPPC) regime introduced stricter emission controls. The level of emissions from these incinerators was very much higher than from modern incinerators, which makes any conclusions from these studies not directly relevant to the current situation. Notwithstanding this, most of the epidemiological (health) studies of populations living near incinerators have not given clear indications of the presence, or absence, of negative health effects.

However, one study of a modern incinerator showed that there is no difference in the amounts of dioxins and furans in blood samples from people living nearby and those living further away (Gonzalez et al. 2000).

After considering all the available evidence the experts of the government's independent advisory Committee on the Toxicity of Chemicals (COC) came to the conclusion that "any potential risk of cancer due to residency (for periods in excess of ten years) near to municipal solid waste incinerators was exceedingly low and probably not measurable by the most modern techniques".

Studies on composting sites

Hazards from bioaerosols have been shown to lead to a number of distinct health conditions. Studies have shown that levels of bioaerosols in a number of commercial scale composting facilities represent a distinct hazard. Residents near composting sites could experience an increased rate of adverse health impacts such as bronchitis, coughing and eye irritation, but no link has been found with asthma. More research is needed in this area.

Results of research on potential environmental impacts

Potential environmental impacts

The two most important potential impacts are due to the emission of so-called 'greenhouse gases', with the potential to affect global climate, and the emission of acid gases which might contribute to acid rain (Table 4.6.2).

Table 4.6.2. - The main environmental impacts		
Technique	'Greenhouse gas' emissions	Acid gas emissions
Materials recycling facilities	Slight overall benefit	Nil
Composting	Small effect due to CO ₂ & possibly other emissions	Nil
Anaerobic digestion	Small effect due to CO ₂	Minor adverse effect
Incineration	Small effect due to CO ₂	Minor adverse effect
Advanced thermal treatment	Small effect due to CO ₂	Minor adverse effect
Mechanical biological treatment	Small effect due to CO ₂	Low or nil
Landfill	Large effect due to methane	Minor adverse effect
Transport & waste transfer stations	Minor benefit due to more efficient logistics	Minor adverse effect

Conclusions on environmental impacts

With the exception of methane emissions from landfill sites, properly designed and managed MSW facilities have minimal effects on the environment. Although some processes do emit acid gases the amount and effect of these will be negligible compared to other sources of acid gases, such as combustion of fossil fuel and transport.

Quantifying the health effects

The DEFRA report included a quantitative assessment of the health effects of emissions to air from MSW treatment (summarised in Table 4.6.3).

Emissions of dioxins and furans from modern incinerators amount to between 0.3% and 0.8% of the background exposure from other sources. On this basis "the incinerator dioxin emission contribution to exposure of local populations is entirely negligible" (Environment Agency 2003).

Table 4.6.3. - Comparison of health effects

Number per year in the UK due to:				
Health impact	MSW management	Skin cancer (Mainly due to sunlight & sunbeds)	Lung cancer due to passive smoking	Health impacts due to overall air pollution
Deaths brought forward	0.55			11,600
Hospital admissions	4.9			14,000
Cancers	0.0014	6,000	hundreds	
Data quality	Poor	Moderate	Poor	Poor

The report was unable to estimate the potential health effects from composting sites because of a lack of quantitative information on emissions. More work on the possible health effects of composting is needed, as there is some epidemiological evidence suggesting that health effects might occur in people living close (within 250 metres) to MSW composting sites.

Comparison of health effects from MSW management with other causes

The calculated total number of estimated extra hospital admissions at less than five per year is very small. Other influences on health are much more important than the management of MSW, even for people living near to sites handling MSW.

Conclusions from this review of potential health and environment impacts

The scientific position

There is disagreement amongst some scientists over the precise nature of technical points such as threshold and non-threshold chemicals and the low-dose effects of some toxic chemicals.

Further research urgently needs to be carried out in areas where there is a lack of good quality data; especially bioaerosol emissions in general, and most emissions from composting, MBT and Anaerobic Digestion.

In spite of the above there is now sufficient good quality research available to be able to say that, with the exception of landfilling, MSW treatment is responsible for only a very small fraction of national emissions of hazardous chemicals. Furthermore, it does not lead to significant adverse health or environmental effects (with the exception of workers at some sites and open 'windrow' composting, see below).

Emissions from MSW treatment in context

All forms of MSW treatment give off potentially harmful emissions. There are strict controls on such emissions, which must be maintained and fully enforced.

'Dioxin' emissions from MSW incinerators make up between 0.3 and 0.8% of national 'dioxin' emissions. Domestic cooking and heating produce 18% of UK 'dioxin' emissions. Bonfire night and fireworks amount for about 14% of national emissions.

MSW treatment is responsible for less than 2% of national emissions of volatile organic compounds (VOCs excluding methane). The VOC benzene, a known carcinogen, is of particular concern but less than 0.02% of UK emissions are due to MSW treatment. The level of VOCs in domestic indoor air is ten times greater than outside (from furnishings, cleaners, etc.).

Nitrogen oxides (NO_x) are a significantly harmful air pollutant but less than 1% of national emissions arise from MSW management. Road traffic is responsible for 42% and electricity generation for 24% of these emissions. About 70% of our exposure to NO₂ occurs in the home, mainly from gas cookers.

Metal emissions from MSW treatment (incineration and landfill sites) amount to about 0.1% for As, 10% for Cd, 1.65% for Hg (mercury) and 0.2% for Ni as percentages of national annual emissions. Almost all the Cd comes from landfill sites. Crematoria give rise to 16% of national emissions of Hg.

Data in respect of PAH emissions to air is poor but MSW treatment probably accounts for less than 3% of total national emissions to air.

Bioaerosol emissions may be a concern with non-combustion waste treatment technologies, particularly at composting, MBT and anaerobic digestion sites and possibly at some materials recycling facilities.

Emissions of methane from landfill sites amount to about 27% of the national total emissions of methane. Agriculture accounts for about 40 % of the national emissions of this 'greenhouse gas'.

MSW management emits about 2.4% of the national total emissions of carbon dioxide.

Health impacts in the UK

There are adverse health impacts, especially from bioaerosols, for some workers at some MSW composting and MBT treatment facilities. Such impacts may affect residents near those sites. However, further research is needed with regard to the effects of bioaerosols in particular.

An exhaustive review has shown there is no definite evidence of a causal connection between living near a MSW landfill site and adverse health impacts.

MSW treatment is calculated to cause 4.9 hospital admissions per year compared to 14,000 for air pollution as a whole, (that is about 0.035%).

'Deaths brought forward' due to MSW treatment are calculated to be 0.55 per year as opposed to 11,600 due to air pollution as a whole (that is less than 0.005%).

Cancers caused by MSW treatment are calculated to be 0.0014 per year (one in seven hundred years) as opposed to some 6,000 skin cancers per year caused by sunlight and sunbeds and 'hundreds' of lung cancers per year caused by passive smoking.

The implications for waste management in Milton Keynes

Biodegradable waste should not be landfilled because it leads to considerable emissions of methane, which contribute significantly to global warming.

Landfilling should be the option of last resort for any waste containing cadmium as landfills emit about 10% of national Cd emissions to air.

With the exception of landfilling and possibly composting, there are no compelling reasons, based on health or environmental impacts, to prefer one properly designed and managed MSW treatment technique over another.

With the exception of landfill sites and their emissions of methane and cadmium, provided MSW management sites are properly designed, managed and regulated, particularly with regard to emissions of bioaerosols, their overall impact on health and the environment is minimal, when compared to other causes of such impacts.

Open 'windrow' composting should be avoided close to where people live or work, especially if the boundary of the facility is within 250 metres of a workplace or the boundary of a dwelling, unless and until further research is able to show that potential health impacts near to composting sites are negligible.

There are no compelling reasons to rule out any form of modern thermal treatment of MSW, including incineration. The "DEFRA" report concluded that risks to human health from incineration are small in comparison with other known risks.

The differences between MSW management technologies in relation to the potential health and environmental impacts investigated in this review are minimal compared to the impacts from non-MSW sources, with the exception of landfilling and 'open - windrow' composting as noted above. It is therefore

suggested that the choice of technologies should be based on other criteria e.g. meeting the requirements of the planning and pollution control regimes, cost, efficiency, deliverability, land-take, compliance with statutory targets/allowances etc.

Information and advice about environmental issues

The Environmental Protection Team is always willing to provide information and advice about these issues or any aspect of the Milton Keynes Environment. They may be contacted through the Environmental Services helpline (01908 252570) or by e-mail on ehpt@milton-keynes.gov.uk

References

COMEAP 1998. Report: *The quantification of the effects of air pollution on health in the United Kingdom*. ISBN 0113221029. HMSO.

DEFRA 2002. *Dioxins and dioxin-like PCBs in the UK environment*. Department for Environment, Food and Rural Affairs, London.

DETR 2000. *Waste Strategy 2000 for England and Wales*. Department for the Environment, Transport and Regions, London.

Dore C.J., Watterson J.D., Goodwin J.W.L., Murrells T.P., Passant N.R., Hobson M.M., Baggott S.L., Thistlethwaite G., Coleman P.J., King K.R., Adams M., Cumine P.R. 2004. *UK Emissions of Air Pollutants 1970 to 2002*. UK National Atmospheric Emissions Inventory, National Environmental Technology Centre.

Elliott P., Morris S., Briggs D., de Hoogh C., Hurt C., Jensen T., Maitland I., Lewin A., Richardson S. Wakefeld J. and Jarup L. 2001. *Birth outcomes and selected cancers in populations living near landfill sites*. Report to the Department of Health, The Small Area Health Statistics Unit (SAHSU), London.

Environment Agency 2003. *Review of Incineration and other combustion techniques*. Prepared by: The University of Birmingham, Sheffield University, Leeds University, Leicester University (Draft report). q.v. Enviro et al. 2004.

Enviros Consulting Ltd., University of Birmingham with Risk and Policy Analysts Ltd., Open University and Maggie Thurgood. 2004. *Review of Environmental and Health Effects of Waste Management: Municipal Solid Waste and Similar Wastes*. Department for Environment, Food and Rural Affairs, London.

Farmer, A. & Hjerp, P. 2001. *Municipal Solid Waste Incineration: health effects, regulation and public communication*. National Society for Clean Air and Environmental Protection, Brighton.

FoE 2002. *Briefing Incineration and Health Issues*. Friends of the Earth, London.

Gonzalez, C.A., Kogevinas, M., Gadea, E., Huici, A., Bosch, A., Bleda, M.J. and Papke, O. 2000. Biomonitoring study of people living near or working at a Municipal waste incinerator. *Archives of Environmental Health*. 55(4), 259-267.

MKCEPT 2005. *A Review of Potential Health and Environmental Impacts from Municipal Solid Waste Management Techniques in Milton Keynes*. Milton Keynes Council Environmental Protection Team, Environmental Health Division, Report July 2005.
I Health Division, Report July 2005.

SECTION 5 - HOW DO WE GET THERE?

Action Plans to Reach Targets and Allowances

In the preceding chapters it has been seen that Milton Keynes Council has to meet serious challenges.

The most important of these is that it must meet landfill allowances or face considerable fines, possibly up to £11m per year.

In addition it should strive to meet regional and national recycling targets. The proposed national 2007/8 target of 30% recycling and composting for Milton Keynes is probably achievable, and also the 2010 regional target of 40% recycling or composting. However targets beyond this would appear to be very difficult to meet unless there are significant legislative, policy or social developments which are not foreseen at present.

The council will also need to minimise waste arisings as far as possible. It will also need to expand education, publicity and enforcement activities to ensure that the infrastructure it puts in place is used to maximum effect.

Procurement of new contracts

There are many actions that the Council could take, and they are listed in the following pages. However, one action above all others will affect whether landfill allowances and recycling/composting targets are achieved. This is the procurement of new collection and disposal contracts to supersede all the current contracts terminating in 2007. This will put in place the necessary infrastructure to enable the Council to meet allowances, and allow the continuation and improvement of existing statutory services. Many of the other actions relate to this larger action and are interlinked with it.

Some of the actions are continuations of existing actions from the previous strategy; others are new.

Action Plans

Actions	If Continuation of previous action, results achieved to date	Purpose: relationship to targets, landfill allowances, policies, and consultation	Targets and measurement
Procurement of New Contracts			
1. Investigate and identify options to fund shortfall between existing services and new services required over contract period.	New	To meet landfill allowances, targets and continuation of services	Outline business case to be in place by March 2006
2. Procure new waste collection and disposal arrangements to meet recycling and recovery targets and landfill allowances, in line with Council Municipal Waste Strategy policies and Waste Development Plan Document, which may include the following, subject to further evaluation <ul style="list-style-type: none"> - Weekly collection of residual refuse - Use of plastic sacks for containment of refuse - Least disruption to existing established methods of refuse and recycling collection wherever possible - Adequate and efficient distribution of recycling containers (sacks/boxes) - Treatment facilities for residual wastes using the following criteria when assessing technologies: <ul style="list-style-type: none"> o Reduces pollution as much as possible o Reduces waste for landfilling o Generates energy from waste o Reduces climate change as much as possible o Includes extra recycling 	Continuation of existing action – initial consultations for procurement process began in 2005	To meet landfill allowances, targets. To ensure continuation of statutory services. To achieve best value. In line with consultation responses on methods of containment.	New collection and disposal contracts to be developed ensuring ongoing contractual arrangements from 2007/8, aiming to meet landfill allowance and recycling/recovery targets

Actions	If Continuation of previous action, results achieved to date	Purpose: relationship to targets, landfill allowances, policies, and consultation	Targets and measurement
Diversion of recyclables from street cleaning <ul style="list-style-type: none"> - activities, including leaves - Diversion of materials from mechanical street sweepings - Diversion of more bulky goods to recycling/re-use, including WEEE (subject to implementation of relevant legislation expected in 2006) - Inclusion of other materials into recycling collections (e.g. drinks cartons) and recovery at CA sites (e.g. paint) - Kerbside collection of textiles 			
3. Develop a contingency procedure to meet landfill allowances in the event that waste growth exceeds predictions, facilities do not come on stream on time, or other unforeseen events.	New	To meet landfill allowances and to ensure statutory services are delivered	Contingency procedure to be in place by April 2006
Waste Minimisation			
1. Continuation/expansion of home composting promotion in 2006, and evaluation of continuation beyond this date	Home composting promotion increased significantly in 2003/4 when the Council became a "WRAP" home composting pilot area in 2003/4.	To decrease waste generation. Consistent with zero waste policy, as supported by CAGOW and responses to short questionnaire.	<ul style="list-style-type: none"> - 1,500 new properties to be home composting each year. - All new properties to be supplied with compost bins. - Supporting information to be sent to all existing home composters each year.

Actions	If Continuation of previous action, results achieved to date	Purpose: relationship to targets, landfill allowances, policies, and consultation	Targets and measurement
	Over 22,000 bins have been distributed to date		- Evaluation of continuation of the scheme to be in place by June 2006
2. Continued promotion of nappy waste reduction initiatives, following evaluation.	In 2004/5 the Council received a grant to employ a "Real Nappy Development Officer" and to offer a £30 "cashback" to parents using re-useable nappies	To decrease waste generation and hazardousness of waste; consistent with zero waste policy, as recommended by CAGOW and responses to short questionnaire	<ol style="list-style-type: none"> 1. Employ part-time permanent Real Nappy Development Officer by April 2006. 2. 10% of babies to be using real nappies by March 2007, with 1% annual improvement in each year 3. Continue cashback, loan scheme, and other current promotions.
3. Develop and implement a communications strategy and promotional programme of waste minimisation and recycling to increase effectiveness of existing programmes, communicate changes due in new contracts, and effective lobbying to get changes at national level to minimise amount of waste produced e.g. lobbying for strong, effective producer responsibility	New	The consultation emphasised the need to do more education and promotion. This is consistent with the "Educating and influencing" policy and	<ol style="list-style-type: none"> 1. Employ Waste Communications Officer, to be in place by September 2006, following evaluation. 2. Costed waste communication strategy to be

Actions	If Continuation of previous action, results achieved to date	Purpose: relationship to targets, landfill allowances, policies, and consultation	Targets and measurement
Legislation		the Zero waste policy – it will ensure that the Council’s waste minimisation and recycling initiatives have maximum effect, and help meet landfill allowances and targets	Adopted by December 2006 with annual review
<p>4. Consider support for Age Concern to expand furniture reuse initiatives compatible with new contracts in 2007 by the following:</p> <ul style="list-style-type: none"> a) Improve and Increase turnover from current site (6 Burners Lane) by offering evening collections and a “gold” 48-hour priority delivery service. This will involve extra costs but increase recycling of household furniture & items by 10- 20 % b) Open a further home store in the north of the borough c) Find long term sustainable funding for furniture first re-use project (lottery funding due to end in 2007) d) Investigate recycling of wood rather than scrapping large unsold wooden items 	<p>The Age Concern operation expanded in late 2004 to include a “Furniture First” re-use project aimed at helping those in need. This project was done in conjunction with other voluntary organisations and with the support of the Council.</p>	<p>To reduce overall msw arisings, and hence amount landfilled and targets; consistent with zero waste policy</p>	<ul style="list-style-type: none"> a) An extra 5 tonnes per week recycled in 2006/7 b) Increase reuse/recycled by a further – 1,000 – 1,500 tonnes per annum. c) This currently recycles 4.2 tonnes per week with just two days being open per week – has the potential to increase by a further 50%

Actions	If Continuation of previous action, results achieved to date	Purpose: relationship to targets, landfill allowances, policies, and consultation	Targets and measurement
			d) Saves 3 tonnes per week going to landfill
5. Review mechanisms of reducing waste deposited at CA sites e.g. permitting systems to restrict use to Milton Keynes residents only	New	To reduce msw and help meet landfill allowances and targets Consistent with zero waste policy.	To be reviewed by April 2006 for inclusion in new contracts.
6. Increase enforcement activity targeted at - flytipping - Litter - Correct use of recycling systems - Abandoned vehicles The increased enforcement activity will decrease municipal waste and improve recycling rates	The enforcement team within the Safer Communities Unit has recently been expanded from 1 to 4 officers. These will be targeted to work on fly tipping and litter in prioritised geographical areas. As a consequence there will be increased activity in relation to	As recommended by the CAGOW and an output from the short questionnaire in the consultation. Consistent with zero waste policy. Will help to decrease waste sent to landfill and meeting targets	Review and implement targets for inappropriate presentation of waste by April 2006

Actions	If Continuation of previous action, results achieved to date	Purpose: relationship to targets, landfill allowances, policies, and consultation	Targets and measurement
	education, the subsequent issue of fixed penalty notices and in prosecutions.		
7. Investigate, and, if found appropriate, implement a system of “mandatory” recycling or incentives for recycling	New	To maximise recycling diversion and meet landfill allowances. Consistent with zero waste policy and a recommendation from consultation	Evaluation to be carried out by October 2006 for implementation with new contracts.
Expansion of Recycling Collections			
1. Continue and evaluate Food Waste Collection Trial	Food waste trial began in September 2005	To increase recycling rate and to meet landfill allowances, consistent with zero waste policy, and supported in the short questionnaire in the consultation.	Evaluation to be complete by September 2006.
Growth and Planning Issues			
1. New developments: a. Research new methods of waste collection and disposal suitable for new developments b. Develop a technical advice note in association to the Supplementary Planning Document on Social	New	To enable landfill allowances and recycling targets to be met. Respondents in the	1. Part-time new developments waste liaison officer to be in place by September 2006

<p>Infrastructure Planning Obligations (2005) and the developing Supplementary Planning Document on Sustainable Development (Residential Schemes). This will list planning requirements for new developments, taking particular account of changing nature of housing and population in Milton Keynes</p> <p>c. Give advice to developers on waste & recycling requirements of new properties/developments; ensure all new residential properties have adequate start-up information on recycling and waste management</p>		<p>consultation felt that more emphasis should be placed on recycling in new developments</p>	<ol style="list-style-type: none"> 2. Research on appropriate methods of waste collection and disposal, including developer input and input from Milton Keynes Partnership to be completed by April 2006 3. Develop Technical Advice Note by June 2006 4. Ensure all new developments meet SPD and that new residents have information and facilities on arrival to enable immediate participation in and understanding of recycling schemes
<p>2. Acquire sites for new facilities necessary to enable Milton Keynes Council to meet its recycling and recovery targets and landfill allowances which could include:</p> <p>a. Two CRC sites</p>	<p>A search has already begun for CA sites. One site has been proposed in the</p>	<p>To enable landfill allowances and recycling targets to be met;</p>	<ol style="list-style-type: none"> 1. Develop site assessment criteria in partnership with the Waste Development Plan Document, using

Actions	If Continuation of previous action, results achieved to date	Purpose: relationship to targets, landfill allowances, policies, and consultation	Targets and measurement
<ul style="list-style-type: none"> b. Residual waste treatment plant c. Waste Transfer station d. Treatment/separation plant for bulky waste e. (Possibly) abpr - compliant composting plant (depending on results of food waste trial and whether such sites are becoming locally available) f. Plant to enable separation of mechanical road sweepings to increase recovery g. Depot for vehicular access 	<p>Eastern Area Expansion; however, this is not likely to be available in the immediate future. Improvements have begun at the other 3 sites, to be in place by March 2006</p>		<p>2. the results from the consultation, and guidance on statutory measures and constraints.</p> <p>Allocate sites in the preferred options of the Waste Development Plan Document by June 2006</p>
<p>3. Carry out a Strategic Environmental Assessment on the Waste Strategy and the Waste Development Plan Document together.</p>	<p>A scoping study has already been developed</p>	<p>To enable recycling targets and landfill allowances to be met</p>	<p>SEA/SA is a continuous assessment.</p>
Funding and Best Value			
<p>1. Seeking external funding for new and existing initiatives to reduce waste and ensure that statutory targets are met.</p>	<p>Some external funding has already been received but will mostly run out in 2006</p>	<p>To ensure best value</p>	<p>Continual evaluation</p>
<p>2. Identify opportunities to work in partnership with neighbouring local authorities throughout the procurement process</p>	<p>New</p>	<p>To ensure best value</p>	<p>Partnerships to be in place before new contracts</p>

Actions	If Continuation of previous action, results achieved to date	Purpose: relationship to targets, landfill allowances, policies, and consultation	Targets and measurement
3. Explore chargeable systems for bulky goods collections	New	To ensure best value	Decision to be made to include in new contracts by April 2006
4. Work with Milton Keynes Partnership and the Local Strategic Partnership to ensure that provision is made for necessary infrastructure in new developments, and that all available grants and funding to assist with waste infrastructure are obtained	Some working together has already started	Consistent with policies of “co-operation and partnerships” and “best value”	Continual working together.
Influencing			
1. Promotion of waste minimisation/recycling to businesses, including waste exchange scheme, waste directory and other initiatives, including good design for recycling, subject to funding.	Continuation of existing activity – Council has a website which gives information on waste minimisation and recycling	To promote “zero waste” and reduce the need for local waste facilities. A recommendation from consultation. In line with current council policies on “educating and influencing” and “commercial waste”.	<ol style="list-style-type: none"> 1. Find funding for business promotion by April 2006 2. Employ Business Waste Minimisation Advisor, subject to evaluation. 3. Continual update of websites 4. Waste Exchange scheme to be in place by June 2007

Glossary

Anaerobic digestion a process where biodegradable material is broken down by micro-organisms in the absence of oxygen. Usually carried out in a sealed vessel, producing a *biogas* (mostly methane), which can be used to provide energy, and a stabilised material known as *digestate*.

ATT – advanced or alternative thermal treatments such as pyrolysis, gasification and high-temperature incineration which claim to provide lower emissions than traditional incinerators

Best Value a duty placed on local placed on local authorities to deliver services by the most effective, economic and efficient means available.

Biodegradable Municipal Waste (BMW). Municipal waste is “household waste and other waste which because of its composition is similar to household waste”. Biodegradable refers to the portion of it, which is readily broken down by micro-organisms.

Biodrying – see MBT

BPEO - Best Practicable Environmental Option – the outcome of a systematic consultative and decision-making procedure, which emphasises the protection and conservation of the environment across land, air and water. The BPEO establishes for a given set of objectives that option which provides the most benefits or least damage to the environment as a whole, at acceptable cost, over the longer as well as the short term. (Royal Commission on Environmental Pollution, 1988)

CA or Civic Amenity site – Formerly known in Milton Keynes as Household Waste and Recycling Centres, and now re-launched as "Community Recycling Centres". Statutory sites which must be provided by the Council for the collection of bulky and garden wastes from residents.

CHP – see incineration

Community Recycling Centres – see CA sites

Community Strategy – an overarching framework guiding local development and planning and Council aims and objectives. It is produced by the Local Strategic Partnership

Composting – the breakdown of the biodegradable components of waste by micro-organisms in the presence of air/oxygen

Dioxins a family of 210 chlorinated compounds consisting of polychlorinated dibenzodioxins and dibenzofurans. 17 of the compounds are toxicologically significant. They are formed as part of the combustion process.

Energy from Waste (EfW) see Waste-to-energy

European Waste Catalogue – The standard EU categorisation of wastes into nearly 1000 different categories.

Gasification – the conversion of waste into a gas by partial oxidation under the application of heat. Partial oxidation is achieved by restricting the flow of air. The gas is typically formed above 750C. It is cleaned to remove tars and particulate matter and then used in a gas engine, turbine or boiler to generate power and/or heat.

Hazardous waste (known as “Special Waste” in UK legislation) – waste listed in the European Waste Catalogue as hazardous e.g. pesticides, cfc-containing materials etc. Some hazardous wastes are banned from landfill.

Heavy metals - heavy, dense metallic elements which are often hazardous. Includes cadmium, lead, mercury, nickel, thallium

High temperature incineration. Incineration of waste at higher-than-normal temperatures e.g. 1800C. High temperature incineration has until recently only been used for hazardous wastes. Some companies are now proposing to treat municipal wastes at high temperatures.

Home composting – compost made under aerobic conditions by residents in their gardens or allotments, using their own or purchased compost bins

Household Waste and Recycling Centres – see CA sites

Household Waste - The legal definition of household waste includes all waste from domestic premises; churches and places of religious worship; premises occupied by charities; waste from any land belonging to or used in connection with a domestic property, caravan, or residential home; waste from a private garage of less than 25m² floor area or used for the accommodation of a private motor vehicle; waste from private storage premises for domestic use; from house-boats; campsites; prisons and penal institutions; halls and premises used for public meetings; street cleaning arisings, and litter.

Charges for collection may be made for certain types of waste from the above. This includes:

- Articles over 25kgs in weight
- Articles which cannot be fitted into the receptacle provided for waste, or if none is provided, a cylinder 1 metre in length and 750 mm diameter
- Garden waste
- Clinical waste
- Waste from residential homes and hostels, hospitals and nursing homes, universities, schools, and other educational establishments
- Waste from self-catering holiday accommodation
- Dead domestic pets
- Litter from educational institutions
- Mineral or synthetic oils or grease
- Asbestos

- Waste from a caravan not allowed for human habitation throughout the year
- Waste from campsites (other than a domestic property on the site)
- Waste from charities and charitable institutions
- Waste from a prison or penal institution
- Waste from halls and public meeting places

In practice, some of the above premises (e.g. the prison, clinical waste from the hospital, some residential institutions) choose to make their own collection arrangements rather than purchase the service from the Council. The Council currently chooses not to charge for the collection of bulky items from domestic properties, except those which could be considered commercial or industrial waste – i.e. those which you would not normally take with you when you move house such as bathroom suites, fencing etc.

Incineration – combustion of waste in the presence of air/oxygen. When heat and electricity are recovered from this process it is known as *combined heat and power (CHP)*.

Inert waste – waste which will not biodegrade such as glass, concrete, bricks, tiles, soils, and stones.

Landfill Gas – The gas generated in any landfill site accepting biodegradable organic matter. It consists of a mixture of gases, predominately methane and carbon dioxide. It has an offensive odour due to traces of organosulphur compounds, and can be explosive.

Life-Cycle Assessment – A method of evaluating material inputs and emissions relating to the whole life of a product, from raw material acquisition, through manufacture, distribution, sale, use, re-use, maintenance, recycling and waste management.

Local Agenda 21 – A local action plan for sustainable development in the 21st century, following on from the 1992 Earth Summit commitment of world leaders to develop sustainably.

Local Strategic Partnership - a body representing the major local private, public, voluntary and community organisations, responsible for producing the Community Strategy. There is an Environmental Partnership sub-group, which receives reports from the Waste Forum.

MBT – Mechanical Biological Treatment – a combination of mechanical and biological treatments designed to produce any combination of the following: waste reduction, a refuse derived fuel, a compost like material, energy recovery, recyclables recover, or stabilising to reduce biodegradability before landfill. This term covers a wide range of waste treatments.

Non-hazardous waste – waste that is not hazardous or banned from landfill. Is usually biodegradable, but can be landfilled in such a way that risks of pollution etc are considered to be minimal. Includes municipal/household waste.

Pyrolysis – the thermal degradation of waste in the complete absence of air or oxygen. Typically this is in the range 400C-800C. Gas, liquid and a char are produced. The amount relative amounts of gas, liquid oils and char depend upon the temperature used and length of the process. Some processes maximise the gas, others the oils. If oils are the principal product these are stored and used as a fuel. If gas is the principal product it can be fed into a gas turbine or boiler.

Proximity Principle - the principle that waste should be disposed of as close to its point of origin as possible

Residual Waste – the amount of waste left after recycling and composting recovery activities. Often referred to as ‘residuals’.

ROC's - Renewable Obligation Certificates, a financial incentive applying at present only to pyrolysis, gasification and anaerobic digestion.

Special waste – see hazardous waste.

Waste Forum – a sub-group of the Environment Partnership (see LSP) set up to guide strategic waste planning in Milton Keynes.

Waste-to-Energy – the conversion of waste into a useable form of energy-typically heat and/or electricity. Could involve incineration, pyrolysis, gasification, high temperature incineration, anaerobic digestion, or the burning of landfill gas. Also known as energy-from-waste (EfW).

WRAP – The Waste and Resources Action Programme, set up by Waste Strategy 2000, which funds a series of initiatives aimed at reducing waste and increasing recycling. WRAP is a not-for-profit company supported by funding from DEFRA, the DTI and the devolved administrations. For more information see their website www.wrap.org.uk.

Appendix 3

Waste Forum – Constitution

Terms of Reference

1. To critically evaluate, advise, assist and make recommendations to Milton Keynes Council on its Municipal Waste Strategy, which has a stated vision of “Zero Waste”.
2. To consider wider actions that are necessary in order to manage and reduce other waste streams arising from or imported to the Milton Keynes area.
3. To become informed of the issues surrounding waste management in the Borough of Milton Keynes and to understand and remain up to date with these issues.
4. To research, collect and disseminate information about waste management practices for the purpose of encouraging the use of more sustainable waste management practices (including waste minimisation, re-use, recycling, composting and, if appropriate, energy recovery by means of various technologies).
5. To educate and make the population of Milton Keynes aware of waste management issues in order to stimulate an informed debate on the subject within the Borough.
6. To consider global, European, national and local policies in looking at waste management in Milton Keynes.
7. To provide Milton Keynes with continually refreshed views on the waste management issues now and for the years to come.
8. To act as an Independent Milton Keynes-wide working group specialising in waste management.
9. To receive presentations from, and provide feedback to, Group members and other interested parties on waste management

Scheme of Appointment

1. The Group should consist of no fewer than 10 and no greater than 20 members.
2. The membership shall be drawn from those groups effected by the issues surrounding waste management, and should consist of representatives of:
 - Private Sector
 - Public Sector
 - Environmental Organisations
 - Academic and other interest groups.

No one sector shall have greater than 30% representation on the Group at any one time.

The make up of the Group should, wherever possible, adequately represent Milton Keynes in terms of geography and demography.

3. Membership of the Group is voluntary, rotational and individuals shall normally be limited to a period of between 1 and 3 years continuous involvement. The position of Chair and Vice-Chair to the Group shall be decided democratically by serving members of the Group. The Group shall annually elect a Chair and Vice Chair. Membership of the Group shall be decided by the Group. Each member of the Group shall be invited to nominate one substitute.
4. The Group shall meet between 6 and 8 times per year, which shall include an annual field based visit. The meetings shall be advertised in the local press and the public and press shall be invited to attend. A public discussion period shall take place at the beginning of every meeting. The minutes of meetings shall be made publicly available. Agenda and minutes shall be sent out no less than three working days prior to meetings.
5. The Council shall provide the secretariat for the Group under direction of the Chair. Initial administrative costs shall be covered by the Council, and subsequent third party contributions will be welcome.
6. Action will only be taken on the basis of majority agreement. Agenda items cannot be resolved unless a quorum of one-third of the Group is present.
7. The Constitution shall be reviewed annually. Any revision to this Constitution shall be subject to a two-thirds majority vote of the full group.

Appendix 4

Zero Waste Charter

The organisations, groups and individuals who have signed this charter are committed to achieving Zero Waste in Britain by 2020. Zero Waste is a new concept being pioneered by leading corporations, municipalities, and now provincial and national governments. It entails re-designing products and changing the way waste is handled so that products last longer, materials are recycled, or, in the case of organics, composted. Waste is in the process of being designed away.

The immediate imperatives behind the drive for Zero Waste are environmental. There is a new awareness of the dangers to human health of waste landfills and incinerators. Landfills are major producers of methane, and polluters of water tables. Incinerators produce greenhouse gases, and are a source of heavy metals, particulates and dioxins. Zero Waste strikes at the cause of this pollution.

It also lightens the ever-growing pressure on the world's forests, soils, and mineral resources by making more with less. Doubling the life of a car saves the 15 tonnes of materials required to make a new one. Recycling paper gives wood fibres six lives rather than one. Increasing the productivity of resources in this way also leads to major savings in energy. Zero Waste will play a central role in cutting CO2 emissions and sequestering carbon in the soil.

There is a further economic dividend. Redesigning production and increasing recycling to eliminate waste is stimulating a green industrial revolution. New materials and growth industries are emerging, together with a growth in jobs. In Germany recycling already employs more people than telecommunications. In the US, it has overtaken the auto industry in direct jobs. Governments that embarked on policies to reduce waste in order to combat pollution and climate change, are now realising that zero waste is a key element in any post industrial economic strategy.

Municipalities and companies overseas are well on their way to zero waste. They have shown that it is possible to recycle and compost 70% or more of their waste streams with existing product design. Residual materials, which are hazardous, or are costly to recycle can then be phased out and replaced by new clean materials that can be returned to use efficiently and effectively.

Increasing numbers of cities and states have adopted the goal of Zero Waste, including Canberra, Toronto, the state of California, and most recently the Government of New Zealand. This charter seeks to extend these pioneering practices to all the municipalities and producers in the UK.

Our starting point is to create zero waste areas where we live and work – in our streets, and villages, in our schools and hospitals, in municipalities and our many different workplaces. We invite local communities, elected councils at every level, and our major institutions and corporations to sign up to these goals, to put in

place measures to reduce their waste, and to expand recycling and composting with the goal of achieving Zero Waste by 2020.

By ourselves we can only go so far. The current waste regime still favours disposal over recycling. The Government must change this. Many products are difficult or too hazardous to recycle. The Government can change this, too, by making the manufacturers who produce them responsible for the waste that results, and for redesigning products so that they are safe, long lasting and can be easily recycled.

We call on the Governments of Britain, Wales, Scotland and Northern Ireland to end a decade of policy timidity and give a lead to the promotion of Zero Waste by adopting the following 10 point plan to transform Britain's waste economy:

1. Set a target of Zero Waste for all municipal waste in Britain by 2020 (50% by 2010 and 75% by 2015).
2. Extend the doorstep collection of dry recyclables to every home in Britain without delay.
3. Provide doorstep collection of organic waste, and establish a network of local closed vessel compost plants.
4. Convert civic amenity sites into re-use and recycling centres.
5. Ban from 2006 the landfilling of biological waste, which has not been treated and neutralised.
6. Ban any new thermal treatment of mixed waste and limit disposal contracts to a maximum of ten years.
7. Extend the Landfill Tax into a disposal tax. Increase its level, and use it to fund the Zero Waste programmes.
8. Extend Producer Responsibility legislation to all products/materials that are hazardous or difficult to recycle.
9. Open up waste planning to greater public participation and end the commercial confidentiality of waste contracts.
10. Establish a Zero Waste Agency to promote resource efficiency and act as a guardian of public health.