WARWICKSHIRE'S MUNICIPAL WASTE MANAGEMENT STRATEGY

Produced by the
Warwickshire Waste Partnership

Adopted October 2005
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FOREWORD

Warwickshire's Municipal Waste Management Strategy provides a framework for managing waste in Warwickshire for the next 15 years. It has been produced jointly by the Warwickshire authorities. The Warwickshire Waste Partnership has managed the development of the Strategy. We have consulted key stakeholders and the public throughout the development of the Waste Strategy and we will continue to inform and seek opinion throughout its implementation.

The main objective of the Strategy is to provide a sustainable framework for managing our waste, working our way up the waste hierarchy while reducing our reliance on landfill as our primary means of waste disposal.

In 2003/04, 296,793 tonnes of municipal solid waste were produced in Warwickshire, 269,310 tonnes of this was household waste. The majority, 76% was disposed of to landfill. Less than 3% was used to generate energy from waste and 21% was recycled and composted. This is a significant improvement on previous years, but we must do better.

We have set ourselves challenging recycling and composting targets and will ensure that we maximise recycling before we treat or dispose of any remaining waste.

Increases in waste growth and changing waste policy present significant challenges to the Warwickshire authorities. However, by adopting this Waste Strategy we are taking a step towards implementing sustainable waste management in Warwickshire.

Councillor Ken Browne
Chair of the Warwickshire Waste Partnership

ACKNOWLEDGEMENTS

Warwickshire's Municipal Waste Management Strategy has been produced by the Warwickshire Waste Partnership, which consists of Officers, and elected Members representing the six Warwickshire authorities.

Consultants AEA Technology have contributed significantly to the technical aspects of the Waste Strategy and provided a clear framework for the implementation of Warwickshire's Waste.

This work was undertaken through Defra's Waste Implementation Programme (WIP), Local Authority Support Unit (LASU) – Direct Consultancy Support Programme.

The Warwickshire Waste Partnership would like to thank AEA Technology and Defra for their contribution to this report.

The Warwickshire Authorities

North Warwickshire Borough Council

Nuneaton and Bedworth Borough Council

Rugby Borough Council

Stratford-on-Avon District Council

Warwick District Council

Warwickshire County Council

This Strategy was adopted in October 2005 and published in January 2006.

EXECUTIVE SUMMARY

This Waste Strategy provides the framework for managing waste in Warwickshire for the next 15 years.

We cannot continue to rely on landfill as our main method of disposal and need to develop more sustainable methods of managing our waste. We need to change how we approach waste management, moving away from disposal to increasing levels of recycling, reuse and ultimately waste prevention.

The Warwickshire authorities have been set challenging targets to increase the amount of material that is recycled and composted. Furthermore the Landfill Directive states that we must significantly reduce the amount of waste disposed of to landfill. By 2020 we will only be permitted to landfill 52,897 tonnes of biodegradable waste, but it is estimated that we are likely to generate in the region of 204,000 tonnes of biodegradable waste. This clearly shows that we need to invest in alternative methods of treatment for residual waste. If we fail to meet our landfill diversion targets, we will receive substantial fines from the Government. We risk being fined £150 per tonne for every tonne of waste that we landfill over our allowances.

We have identified key strategic objectives which have provided the direction for the development of the Waste Strategy. These are summarised below:

- To manage our waste in order to move up the waste hierarchy and work towards resource management rather than waste management.
- To minimise the amount of waste generated in Warwickshire.
- To maximise the amount of material recycled and composted in Warwickshire and to meet and exceed our statutory recycling targets.
- To limit the amount of waste disposed of to landfill and to ensure that we meet our landfill diversion targets.
- To make use of existing waste treatment infrastructure in Warwickshire.
- To contribute to the generation of energy from a non-fossil source.

In developing the Waste Strategy we critically assessed seven potential waste management scenarios against environmental, socio-economic and operational criteria. This assessment indicated that the best practicable environmental option for managing waste in Warwickshire should incorporate the following:

- Reduce the amount of waste produced in Warwickshire.
- Work progressively towards higher recycling levels, exceeding current statutory targets of 30%.
- Aim to reach aspirational countywide targets of between 40-45% recycling to be achieved by 2009/10.
- Limit the amount of waste disposed of to landfill – making use of existing waste treatment facilities.
- After maximising recycling we will treat all remaining residual waste using a thermal treatment system – generating energy from a non-fossil source.

We have set ourselves challenging targets and significant changes to how we currently collect and dispose our waste are likely to be required in order to achieve these targets. This Waste Strategy provides guidance on the required changes in our waste management service to enable us to achieve our goals.

It is important that the Waste Strategy is not a static document and that it should be reviewed and updated on a regular basis to reflect changes in legislation, circumstance and evolving waste treatment technologies. It is for this reason that the Waste Strategy will be fully reviewed every five years with a review of the critical aspects at critical review points. The first review of critical aspects of the Strategy is scheduled for 2008/09 as this is a critical review point, because infrastructure for processing biowaste should be in place by 2008/09.

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Appendices

1 INTRODUCTION

1.1 What is the purpose of the Waste Strategy?

Waste presents one of the major environmental challenges facing England today. Improving how we manage our waste is critical to our economic and environmental future. Our current waste disposal methods harm the environment and squander resources.

To ensure that we manage our waste sustainably and meet our targets, the Warwickshire Authorities have worked together to produce a Municipal Waste Management Strategy, which provides the framework for managing waste in Warwickshire over the next 15 years. The Strategy provides an action plan focused on waste prevention, minimisation, recycling and composting, paving the way for future strategies and contracts that provide an alternative to landfill.

This version updates the draft waste strategy, which was agreed in January 2004. It includes findings from additional studies that have been commissioned and responses to the public consultation exercise which was held in February 2005.

The Strategy describes current arrangements, the targets that Warwickshire has to meet, and how the targets will be met.

1.2 Why do we need a Waste Strategy?

Historically waste has been increasing year on year and it has been estimated that waste generation increases by 3% every year. Nationally and in Warwickshire we have started to take steps to ensure that we reduce the amount of waste we generate and manage the waste we do produce by the most sustainable means.

Waste production in Warwickshire, as with the rest of the country is on the increase (in 2003/04 waste levels increased by 7% above the previous year). This is not sustainable and we need work actively to curb waste growth and develop alternative means of waste treatment and disposal. We are rapidly running out of landfill space and cannot continue to rely on holes in the ground as our primary means of disposal.

In 1999 the EU Landfill Directive (99/31/EC) set out ambitious targets for the reduction of biodegradable municipal waste landfilled. In response to this Directive the Government produced Waste Strategy 2000, which gives a higher priority to waste prevention, minimisation, recycling, composting and recovery and sets out targets for local authorities. In Waste Strategy 2000, the Government recognised that changing the way we manage waste and resources can make an important contribution to improving our quality of life.

Concerns about sustainable development at the global level, global warming e.g. from methane gas from landfill sites, natural resource depletion (the “throw away” society) and environmental pollution (emissions to land, water and air) are translated into increasingly stringent EU-wide responses which are then incorporated in to UK legislation and regulations.

The outcome is a recognition at International, European and National levels that large-scale reliance on landfilling of waste is unsustainable and a missed opportunity. The new agenda seeks to give much higher priority to waste prevention, minimisation, recycling, composting and recovery (e.g. energy from waste), making disposal the option of last resort.

1.3 What does the Waste Strategy cover?

This document details how Warwickshire will handle and treat municipal waste which includes:

- Waste collected from households (domestic waste collection)
- Kerbside collected recyclables
- Kerbside collected garden waste
- Recycling bring banks
- Bulky household items
- Waste from household waste recycling centres
- Street sweepings and litter
- Trade waste collected as part of the domestic waste collection service
- Hazardous and clinical household waste
- Fly-tipped waste
- Waste from markets and educational establishments

The strategy does not cover the collection and treatment of commercial and industrial waste. Therefore this strategy does not consider future requirements, such as treatment plants or landfill capacity, for waste produced from commercial and industrial sources.

1.4 Roles and responsibility – Strategy development

Warwickshire's Waste Strategy has been developed jointly by officers and elected members from all six authorities in Warwickshire. In Warwickshire there are five waste collection authorities and one waste disposal authority, which are as follows[1]:

Waste Collection Authorities (WCAs)
The five waste collection authorities are:

- Nuneaton and Bedworth Borough Council
- North Warwickshire Borough Council
- Rugby Borough Council
- Stratford-on-Avon District Council
- Warwick District Council

[1] The WCAs and WDA have different responsibilities with respect to the collection and treatment of municipal waste, these are discussed in detail in Section 3.2.

Waste Disposal Authority (WDA)

- Warwickshire County Council

The Government expects local authorities to work together to achieve the following:

- Effective working relationships that will deliver a comprehensive Joint Municipal Waste Management Strategy that includes clear objectives and timescales for action.
- Put in place effective arrangements to reduce waste and maximise recycling and recovery. These should achieve the statutory performance for waste.
- Raise awareness of the costs of dealing with waste and the role that individuals can play in reducing waste.
- Involve local people in decisions on waste and work with community schemes to promote reuse and recycling.
- Form consortia and other arrangements that will gain improved terms with re-processors and other outlets for recyclable materials.

1.4.1 Warwickshire Waste Partnership

The waste collection and disposal authorities work jointly together as the Warwickshire Waste Partnership. The Warwickshire Waste Partnership consists of Officers and elected Members representing the six Warwickshire authorities. The Partnership is responsible for overseeing the development of the Strategy. The Warwickshire authorities are working to formalise the Waste Partnership by developing a Memorandum of Understanding. The Memorandum of Understanding will underpin the objectives of the Waste Strategy.

1.4.2 Officer Steering Group

The detailed content and development of the Strategy has been decided by the Officers Steering Group. The Officers Steering Group consists of waste management officers from each of the Warwickshire authorities as well as representation from planning and finance departments. Key Stakeholders and the public were also consulted at critical stages during the development of the waste strategy.

1.5 Roles and responsibility – Waste management

Although not directly involved in the development of Warwickshire's Waste Strategy, the following groups and organisations have an important role to play in waste management, providing policy advice, planning and enforcement.

1.5.1 Warwickshire County Council – Planning Authority

Warwickshire County Council is the Mineral and Waste Authority for the County. The County Council has a statutory duty to deal with planning applications involving mineral extraction (sand, gravel, clay, hard rock, coal, limestone and ironstone) and the depositing, recycling and management of waste. These planning applications

are administered by the Development Group. The more contentious or complex decisions to grant or refuse are made by members of the Regulatory Committee

1.5.2 The Environment Agency

The Environment Agency is responsible for environmental regulation in England and Wales. They are responsible for:

- *Authorisations:* issuing permits, licences, consents and registrations
- *Inspection and monitoring:* Monitoring licence holders.
- *Enforcement:* The EA prosecutes environmental crime

1.5.3 Department for Environment, Food and Rural Affairs

Defra is the Government department which is responsible for the Environment including waste and waste management.

Defra's aims are to encourage sustainable development, which means a better quality of life for everyone, now and for generations to come, including: better environment at home and internationally, and sustainable use of natural resources; economic prosperity through sustainable farming, fishing, food, water and other industries that meet consumers' requirements; and thriving economies and communities in rural areas and a countryside for all to enjoy.

The national Government provides through the Waste and Resources Action Programme (WRAP) publicity/education programmes which aim to encourage a reduction in the amount of waste produced and to increase the amount which is recycled.

1.5.4 Industry, Voluntary Groups and Public

There are a number of other groups that will have a role to play in implementing Warwickshire's waste strategy:

- *Waste management companies* – Operating recycling and composting services, which will treat Warwickshire's residual waste, and providing landfill capacity for any waste which has to be landfilled
- *Voluntary groups* – Providing both facilities which enable items such as washing machines to be re-used, and providing and/or supporting additional recycling services.
- *Commerce and Industry* – Reducing waste arisings by, for example, reducing the amount of packaging required for products, and increasing the amount of material that they recycle.
- *Public* – Participating in both waste reduction and recycling activities.

The public will also have an important role in the continuing consultation as the strategy is implemented, particularly with regard to the provision of a treatment facility.

1.6 How has the Waste Strategy been developed?

Following Government guidance, the Waste Strategy has been developed by the Officers Steering group. Further advice and support has also been provided by independent waste consultants.

The Warwickshire Waste Partnership has overseen the development of the Waste Strategy and has approved the key strategy policies and objectives. During every critical stage in the development of the Waste Strategy, stakeholder and public consultation has been carried out, refer to section 9.3 for further details of the consultation process.

Figure 1 provides a summary of the strategy development process.

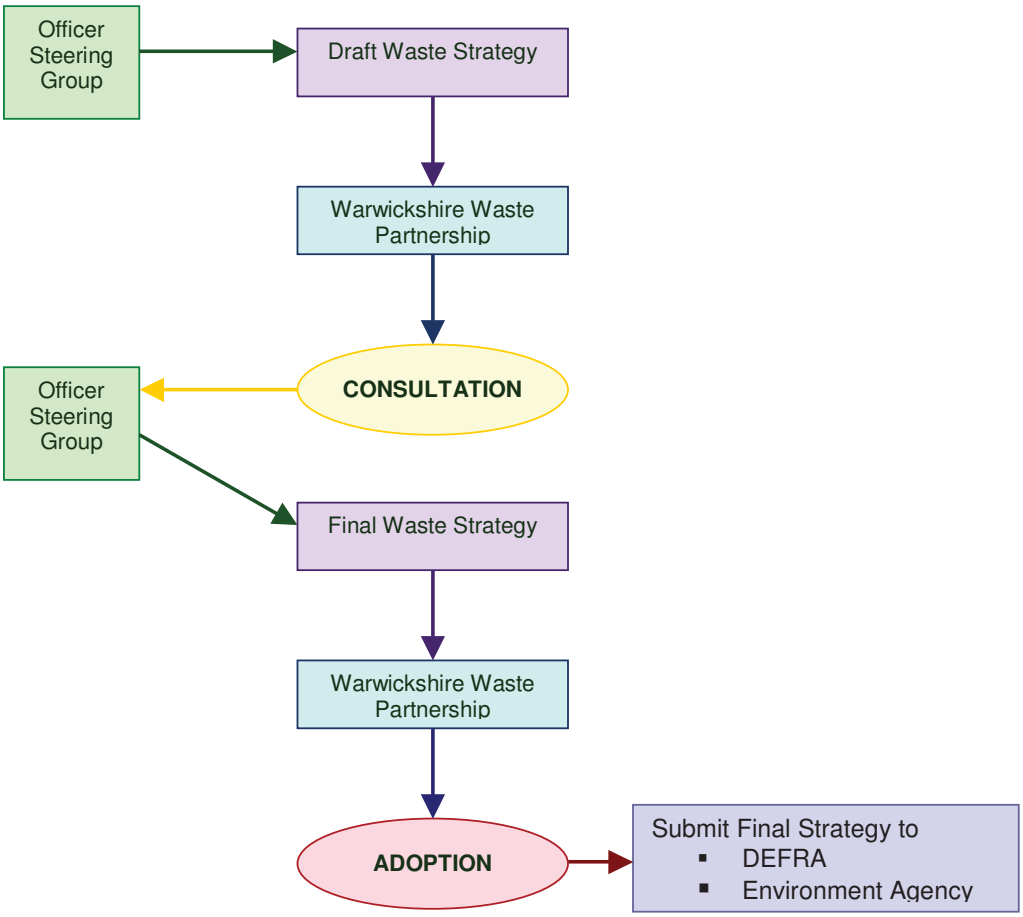

Figure 1: Summary of the strategy development process

1.6.1 Supporting information

A considerable amount of research has gone into producing the Waste Strategy. Details of additional supporting documents can be found in Appendix G.

2 WHAT ARE THE KEY DRIVERS FOR DEVELOPMENT?

As the environmental impact of waste has increased and become better understood, legislation and guidance has been issued at European, National and Regional level indicating the ways in which waste should be managed in a more sustainable way. This legislative framework will change the way waste is dealt with in Warwickshire. Waste management services will need to become more sophisticated, with separate collections of materials, allowing separate treatment. Stricter environmental standards along with taxation and other fiscal measures will lead to an increased cost of dealing with waste.

Key drivers for a change in the management of waste:

- UK Sustainable Development Strategy
- Waste Hierarchy
- UK Waste Strategy 2000
- EU Landfill Directive 1999
- Waste Emissions Trading Act 2003
- Household Waste Recycling Act 2003

2.1 Sustainable development

The concept of sustainable development underpins the development of the Waste Strategy and the identification of waste treatment/disposal options. Sustainable development, put simply is:

> *'Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.'*

A revised version of the UK Sustainable Development Strategy 'Securing the Future' was published in March 2005, the Strategy aims to:

> *'Enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations"*

The revised Strategy builds upon the principles of the 1999 Strategy. It identifies a framework for Sustainable Development which advocates the following guiding principles:

- Living within environmental limits
- Ensuring a strong and healthy and just society
- Achieving a sustainable economy
- Promoting good governance
- Using sound science responsibly

Following on from theses principles, key priority action areas have been identified, these are:

- Sustainable consumption
- Climate change and energy
- National resource protection and environmental enhancement
- Sustainable communities

It is essential that the development of the Waste Strategy incorporates the principles of Sustainable Development to ensure that decisions taken now do not have a negative impact on future generations. It is vital that long-term strategic planning is incorporated and that the social, economic and environmental impacts are considered jointly and not in isolation. It is also possible that decisions made will not only have an impact on a local level, therefore regional, national and even global implications need to be considered.

2.2 European Policy and Legislation

The European Union has become the major source of environmental legislation and guidance in relation to the management of waste. A number of relevant European directives and their likely impact on Warwickshire are detailed in the following sections.

2.2.1 Framework Directive on Waste (75/442/EEC)

This Directive established the fundamental principles for waste management in Europe, which must be reflected in National, Regional and Local Strategies. The key principles are:

The Waste Hierarchy
The waste hierarchy provides a framework of how sustainability in waste management can be achieved. The aim is to move up the waste hierarchy by moving away from a reliance on landfill to increased recycling, reuse, composting and recovery and ultimately waste reduction. It suggests that reducing waste will normally be the best environmental option for waste management and so therefore should be considered before other treatment options. This principle has been employed in the development of this Waste Strategy. However, when assessing waste management proposals the waste hierarchy should be used as a guide rather than being applied rigidly. A certain amount of flexibility is needed to arrive at the most balanced environmental, social and economic solution and inevitably is likely to contain a mixed solution.

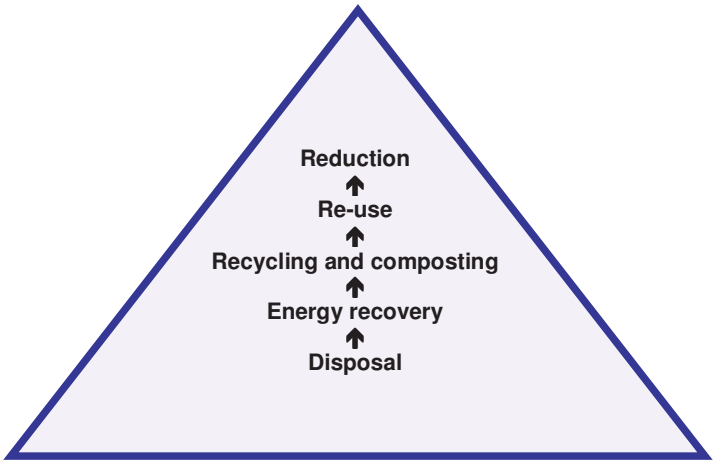

Figure 2: The Waste Hierarchy

Regional Self-Sufficiency
This principle requires that where practicable, waste should be treated or disposed of within the region it is produced. Each region is expected to provide sufficient facilities and services to manage the amount of waste it is expected to produce over the next 10 years. It is recognised that the best solution for some waste may be to transport it to another region where it can be dealt with more effectively. Not all regions have specialist recovery, recycling or treatment facilities, in line with the proximity principal and economy of scale might apply in such cases.

The Proximity Principle
Waste should generally be managed as close as possible to where it is produced in order to limit the environmental impact of transportation and create a more responsible approach to waste generation. This strategy has taken the proximity principle into account when considering waste treatment options.

2.2.2 Landfill Directive (1999/31/EC)

The Landfill Directive requires improvements to landfill management, bans specified hazardous, corrosive and clinical materials from being landfilled together with other waste, requires the pre-treatment of all waste before landfill and sets progressively tighter limits to restrict the amount of biodegradable waste that can be sent to landfill.

The improvements required to landfill sites used by Warwickshire will result in increased costs of landfill in the medium term. This will make the alternatives to landfill more cost-effective. The ban on certain wastes to landfill is likely to require service changes and therefore increased costs. For example, all tyres will be banned from landfill from July 2006. To meet this obligation specific arrangements will have to be put in place to separate tyres for alternative disposal. What will constitute pre-treatment of waste is yet to be finalised, but the Environment Agency - the body that regulates waste management - has suggested that conformance with statutory targets under the Landfill Directive and recycling and composting standards are likely be sufficient for municipal waste.

The most significant aspect of the Directive for the Warwickshire authorities is the phased reduction of the amount of biodegradable waste that can be sent to landfill. The Directive requires that the amount of biodegradable municipal waste sent to landfill is reduced:

- to 75% of 1995 levels by 2010,
- to 50% of 1995 levels by 2013 and
- to 35% of 1995 levels by 2020.

The UK implemented this requirement of the Directive through the Waste Emissions Trading Act 2003.

2.2.3 Directive on Packaging and Packaging Waste (94/62/EEC)

The aim of the Directive is to reduce the amount of packaging waste sent for final disposal, by introducing recovery and recycling targets for packaging waste. Producers are also required to reach packaging waste recovery and recycling targets. The UK has implemented the Directive through the Producer Responsibility (Packaging Waste) Regulations 1997 (as amended). Legislation relating to packaging waste is currently only applicable to businesses and business waste, hence they have little direct implications for the Warwickshire authorities. However the Warwickshire authorities provide advice and guidance to businesses on the packaging regulations and how to achieve compliance.

Obligated producers can choose whether to meet their obligations themselves and register individually with the Environment Agency or join a compliance scheme. The majority of obligated businesses have joined compliance schemes.

This may have the effect of encouraging producers or compliance schemes to fund the enhanced recycling of post-consumer packaging in household waste, and could have an effect on prices for recyclates and the provision of recycling infrastructure.

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

The aim of the Waste Electrical and Electronic Equipment Directive (WEEE Directive) through producer responsibility is to prevent the generation of electrical and electronic waste and to promote reuse, recycling and other forms of recovery. Restrictions on the use of hazardous substances in the manufacture of electronic equipment are also being imposed from 1 July 2006, through the Restriction of use of Certain Hazardous Substances in electrical and electronic equipment Directive (RoHS) which was written in conjunction with the WEEE Directive. Manufacturers will need to ensure that their products and their components comply in order to stay on the market.

The WEEE Directive sets targets for the collection, recycling and recovery of all electrical products – everything from mobile phones to washing machines. Collection systems must be introduced to separately collect a high level of electrical appliances. A target of 4 kg of household electrical goods per inhabitant per year has been set.

Implications for the Warwickshire Authorities:
Currently, local authorities are under no obligation to provide either a collection service for WEEE or provision for its deposit at Household Waste Recycling Centres (HWRC). However, HWRC sites are a logical drop-off point for WEEE although there are concerns regarding the use of these sites for WEEE collection as outlined below:

- Many sites are too small and unable to take increased volumes of waste.
- Some sites may be unable to cope with a significant increase in vehicle throughput.
- Amendments to waste management licences may be needed for some hazardous materials (such as cathode ray tubes), which has financial and time implications.
- Restrictive planning conditions may apply, which may need amending, which again will have time and cost implications.

The Government is consulting on how local authorities will be involved in the collection regime and appear to favour a combination of retailer take-back services and local authority separate collections from the kerbside and at household waste recycling centres (HWRCs). The costs of recycling are to be met by the producers of electrical goods, but the cost of collecting from householders may still fall to local authorities.

2.2.5 Hazardous Waste Directive (91/689/EEC)

The Hazardous Waste Directive (1991) provides the framework for the control of hazardous or 'special' waste. The aim of the Directive is to provide precise and pan-European definitions of hazardous waste to ensure that it is correctly managed and regulated.

In 1994, a comprehensive list of all wastes, hazardous and otherwise, was produced, which is known as the European Waste Catalogue (EWC). The EWC was revised in 2002 to include a range of newly hazardous wastes, which were not previously consigned in England, including everyday items such as computer monitors, televisions and fridges.

The Directive was implemented in the UK through the Special Waste Regulations 1996. The Regulations ensure that special wastes are tracked through a consignment note system, from the point at which they arise until they reach the facility where they are to be either recovered or disposed.

Implications for the Warwickshire Authorities
To comply with the hazardous waste regulations, the Warwickshire authorities are providing separate collection facilities for computer monitors, televisions (cathode ray tubes) and fluorescent tubes at HWRCs. When the WEEE Directive is introduced, producers will become responsible for recycling and correctly disposing of electrical waste that is classified as hazardous such as televisions.

2.2.6 End of Life Vehicles Directive (2000/53/EC)

The End of Life Vehicles Directive (ELV) came into effect in October 2000. This will oblige manufacturers to arrange for the collection and the take back of motor vehicles. Treatment of all end of life vehicles will have to be carried out at authorised facilities prior disposal. Potentially damaging liquids (such as oil and brake fluid) will be removed prior to recycling. A certificate of destruction must be given to the owner of the vehicle (or the council in the case of abandoned vehicles) to ensure that the vehicle is not re-sold.

The ELV Directive was partly transposed into national law on 3 November 2003. The implemented part of the new regulation apply new standards to existing sites, require operators working under a registered exemption to apply for a site licence (if accepting vehicles which have not been de-polluted) and set new minimum technical standards for all sites that store or treat ELVs. Other parts of the Directive are still under consultation according to the Department of Trade and Industry including the recycling/recovery targets and the arrangements for the take back of ELVs.

Implications for the Warwickshire Authorities:
The ELV Regulations 2003 will have an impact on the Warwickshire Authorities with respect to the collection and disposal of abandoned vehicle, because it will no longer be permissible to dispose of ELVs at scrapyards unless they are licensed Authorised Treatment Facilities. Consequently, it was anticipated that this would lead to an increase in the number of vehicles abandoned in the short-term which would place an additional financial burden for Warwickshire Authorities. However, due to the high demand for scrap metal an increase in abandoned vehicles has not occurred yet.

In 2007 it will become the responsibility of vehicle manufacturers to take-back their own brand vehicles. Although Local Authorities will still have to remove abandoned vehicles from the roadside they will not have to pay for de-pollution.

2.2.7 Draft Directive on Batteries and Accumulators and Spent Batteries and Accumulators (2003)

The European Commission has adopted a proposal for a new Batteries Accumulators Directive on 20 December 2004. The draft Directive aims to maximise the separate collection and recycling of spent batteries and accumulators, and to reduce the disposal of batteries and accumulators in the municipal waste stream. The proposal, unlike existing EU legislation on batteries, applies (with limited exception) to all batteries and accumulators regardless of chemical composition. It will repeal earlier Directives, which only apply to batteries containing certain quantities of lead, mercury or cadmium. The UK Government anticipates that the Directive will be finally adopted by mid 2006. Once agreed member states will have 24 months to bring into force the laws, regulations and administrative provisions necessary to comply with this Directive.

The key elements of the draft Directive are:

- A partial ban on portable nickel-cadmium batteries (with some exceptions)
- Collection targets for spent portable batteries.
- A ban on the disposal of untreated automotive and industrial batteries in landfill or by incineration.

Implications for the Warwickshire Authorities:
This is likely to result in local authorities having to provide separate collection facilities for batteries. However, household and vehicle battery recycling containers are already in place at HWRC sites in Warwickshire. Both Warwick District Council and Nuneaton and Bedworth Borough Council already collect car batteries as part of their kerbside collection service.

2.2.8 Waste Incineration Directive (2000/76/EC)

This Directive incorporates and extends the requirements of the 1989 Municipal Waste Incineration Directive and the 1994 Hazardous Waste Incineration Directive into a single document.

The Directive ensures that incinerators continue to be tightly regulated and stringent operating conditions have been introduced. Minimum technical requirements for waste incineration and co-incineration have been set. The Directive applies to all new incinerators and will apply to all existing incinerators from the 28th December 2005. Implementation in the UK occurs mainly under the present Pollution Prevention and Control (PPC) regime.

2.2.9 Ozone depleting substances (Regulation 2037/2000)

European Council Regulation No. 2037/2000 on substances that deplete the ozone layer came into effect at the end of 2001. The aim of this Regulation is to require the removal of all ozone depleting substances (ODS) (including CFCs and HCFCs) from refrigeration equipment before such appliances are recycled. Ozone depleting substances are present in both the refrigerant liquid and the insulating foam in fridges and freezers, but until this Regulation was introduced, the only requirement was to remove the refrigerant liquid before the appliance was recycled.

Implication for Warwickshire Authorities:
Local authorities have to provide sufficient storage capacity for fridges and freezers collected from households or delivered to Household Waste Recycling Centre sites until the white goods can be send to the facilities undertaking the ODS removal prior to recycling. When the WEEE Directive is introduced, producers will become responsible for meeting the costs of the correct disposal.

2.2.10 Thematic Strategy on Soil Protection

In 2002, the EU published a working document on the 'Biological Treatment of Biowaste', which aimed to help for the introduction of measures to meet the Landfill Directive targets. The objectives of the document were as follows:

- Promote biological treatment of biowaste, harmonising national measures to reduce negative environmental impacts.
- Protect soil and ensure that the use of treated and untreated biowaste results in a benefit to agriculture or ecological improvement.
- Ensure that human and plant health is not affected by the use of treated or untreated biowaste.
- Ensure that obstacles to trade of treated biowaste are overcome to encourage international trade within the EC.

In April 2004, the Commission announced that it was no longer going to pursue a specific Directive on Biowaste. Policy regarding biowaste will now be included in the Thematic Strategy for Soil Protection.

2.2.11 Thematic Strategy on Waste Prevention and Recycling

The Strategy proposes the way forward for the next generation of waste legislation, which the EU Commission hopes will help all EU citizens reduce the amount of waste they produce. It is also hoped that it will enable business and local authorities divert waste away from landfill.
There are no targets in the Strategy , instead it proposes ground rules for waste management in the EU to promote a 'recycling society'. It proposes the following:

- Simplification and modernisation of existing legislation
    - Definition of waste
    - Definition of recovery and disposal activities
- Introducing life-cycle thinking in waste policy
- Improving the knowledge base
- Waste prevention
- Towards a European recycling society
    - Create a level playing field for recycling
    - Improved exchange of information on national disposal taxes
    - New ways to foster recycling
    - Recycling targets
    - Management of biowaste
    - Management of waste oils

2.3 National Requirements

2.3.1 Environmental Protection Act 1990 and Environment Act 1995

The requirements of the Framework Directive on Waste were implemented in the UK through the Environmental Protection Act 1990, (as amended by the Environment Act 1995). This primary act controls how waste is managed, defining the different categories of waste and how waste should be controlled. The EPA 1990 defines the duties of Waste Collection and Waste Disposal authorities, it also sets out the Duty of Care applicable to all those handling and disposing of waste.

The Environment Act 1995 also implements various elements of the Waste Framework Directive and is the enabling legislation to cover producer responsibility. The Environment Act facilitated the establishment of the Environment Agency as UK's regulatory authority.

2.3.2 The Financial Act 1996 and Landfill Tax Regulations 1996

Landfill Tax is a tax payable for each tonne of waste sent to landfill and was introduced by the Government in 1996 as a way of encouraging more sustainable means of waste management through recognising the hidden financial effects of the environmental impact of landfill. There are two rates of tax, a lower rate for inactive waste and a higher rate for active waste (i.e. waste with some biodegradable content).

Though the landfill tax will encourage more sustainable waste management practices it means that local authorities will have real increases in the cost of waste management for the foreseeable future. The Chancellor has announced that landfill tax levels will increase by at least £3/tonne each year until the tax reaches £35/tonne by 2010/11.

The landfill tax is currently £18/tonne which will rise to £21 in 2006/2007. Consequently, the increase in landfill tax will cause a significant increase in waste disposal costs and will provide a considerable further incentive to move to alternative more sustainable means of waste treatment in the near future.

2.3.3 UK Waste Strategy 2000 (WS2000)

The Government produced its National Waste Strategy in May 2000, setting out its vision and the actions necessary for making waste management in the UK more sustainable, and thereby meeting the requirements of the European Framework Directive on Waste.

The UK Waste Strategy 2000 sets national targets to recycle or compost at least:

- 25% of household waste by 2005,
- 30% by 2010 and
- 33% by 2015,
- with the further target to recover value from 45% of municipal waste by 2015.

The Government has used the "Best Value" Performance Framework to set individual performance standards for all local authorities for the years 2003/04 and 2005/06 although further recycling targets may be set to enable the national targets to be met. The UK Waste Strategy is currently under review.

2.3.4 Local Government Act 1999 – Best Value Regime

All Authorities are required under the Local Government Act 1999 to provide "Best Value" services and to secure continuous improvement by regularly reviewing the economics, efficiency and effectiveness of their functions. There are four key principles, which underpin Best Value:

- **Challenge** why and how a service is being provided.
- **Compare** performance with other councils and service providers whether services could be improved.
- **Consult** local stakeholders to determine opinions of the service.
- **Compete** wherever practicable, fairly and openly to provide the best services.

Authorities have been set 'Best Value Performance Indicators' (BVPI) for their services, on which they are required to report annually. In addition, to ensure that the national WS2000 recycling targets are met, statutory Best Value Performance Indicators (BVPI) have been set for each local authority. The BVPI recycling targets for Warwickshire County Council are 16% by 2003/04 and 24% by 2005/06.

The other BVPIs relating to waste are amount of waste collected per head, cost of waste collection and disposal. There is no performance indicator for reuse of waste although the Government is currently consulting on the potential addition of a BVPI for reuse.

BV 82a	Total tonnage of household waste sent for recycling (%)
BV82b	Total tonnage of household waste sent for composting (%)
BV82c	Total tonnage of household waste used to recover heat, power and other energy sources (%)
BV82d	Total tonnage of household waste landfilled (%)
BV84	Number of kilograms household waste collected per head (kg/head)
BV86	Cost of waste collection per household (£/household)
BV87	Cost of waste disposal per tonne (£/tonne)
BV91	Percentage of residents served by kerbside recycling (%)
BV199	Local street and environmental cleanliness (%)

Table 1 compares the BVPIs of Warwickshire to the average regional values. This shows that Warwickshire performs better in the recycling and composting service, but on the other hand Warwickshire generates more household waste per head in comparison to the regional average. However, Warwickshire aims to minimise the amount of waste generated and various schemes for waste prevention and re-use are discussed in Section 6 and 7.

Various Counties in the West Midlands region dispose residual waste with thermal treatment with energy recovery, hence the regional average for BV82c is higher as Warwickshire only exports a small amount of waste for thermal treatment.

Table 1: Best Value Performance Indicators for Warwickshire (2003/04)

BVPI	North Warwickshire	Nuneaton & Bedworth	Rugby	Stratford-on-Avon	Warwick	Warwickshire CC	Regional Average *
BV82a	10.5	7.5	12.1	15.7	10.5	13.3	11.2
BV82b	9.9	2.6	2.7	2.5	12.8	8.3	5.4
BV82c	N/A	N/A	N/A	N/A	N/A	2.8	35.0
BV82d	N/A	N/A	N/A	N/A	N/A	75.8	50.4
BV84	430.0	445.2	414.9	388.0	375.0	525.0	439.2
BV86	46.11	37.4	41.13	53.68	34.95	N/A	41.1
BV87	N/A	N/A	N/A	N/A	N/A	30.8	39.4
BV 91	83.0	95.0	97.3	100.0	95.0	N/A	77.3
BV 199	93.5	90.0	100.0	70.0	70.7	N/A	23.8

Source: ODPM website

2.3.5 Strategy Unit Report "Waste Not, Want Not" (2002)

The Prime Minister's Strategy Unit reviewed the progress towards the targets set within Waste Strategy 2000 in a report produced in November 2002. The report suggested that the Waste Strategy 2000 may not be sufficient to move waste onto a more sustainable footing and gave 34 recommendations, including raising the national recycling and composting standard to 35% by 2010 and 45% by 2015, to ensure the United Kingdom's compliance with the requirements of the Landfill Directive. In response to the "Waste Not, Want Not" report, the Government introduced the Waste Implementation Programme to address the recommendations made by the Strategy Unit.

2.3.6 Waste and Emissions Trading Act 2003

The Government has implemented the requirements of the Landfill Directive through the Waste and Emissions Trading Act 2003. This sets Waste Disposal Authorities (such as Warwickshire County Council) annual allowances limiting how much biodegradable municipal waste (BMW) can be landfilled in any particular year with effect from April 2005.

Government's Guidance on Trading, Banking and Borrowing Landfill Allowances sets out the procedure for transferring landfill allowances. Authorities can buy more allowances if they expect to landfill more than their allocations and authorities with low landfill rates can sell their surplus allowances. It will also be able to save unused allowances (banking) or bring forward part of their future allocation (borrowing).

An allocation of the amount of BMW that can be landfilled each year from 2005/06 to 2019/20 has been provided to Warwickshire and these are shown in Figure 3. The allocation for 2019/20 limits the amount of BMW to 52,897 tonnes which can be landfilled in that specific year. Consequently, Warwickshire will have to reduce the amount of waste sent to landfill from its current level of 216,000 tonnes per year (2003/04) to a maximum of 77,789 tonnes (based on 68% biodegradable content in waste).

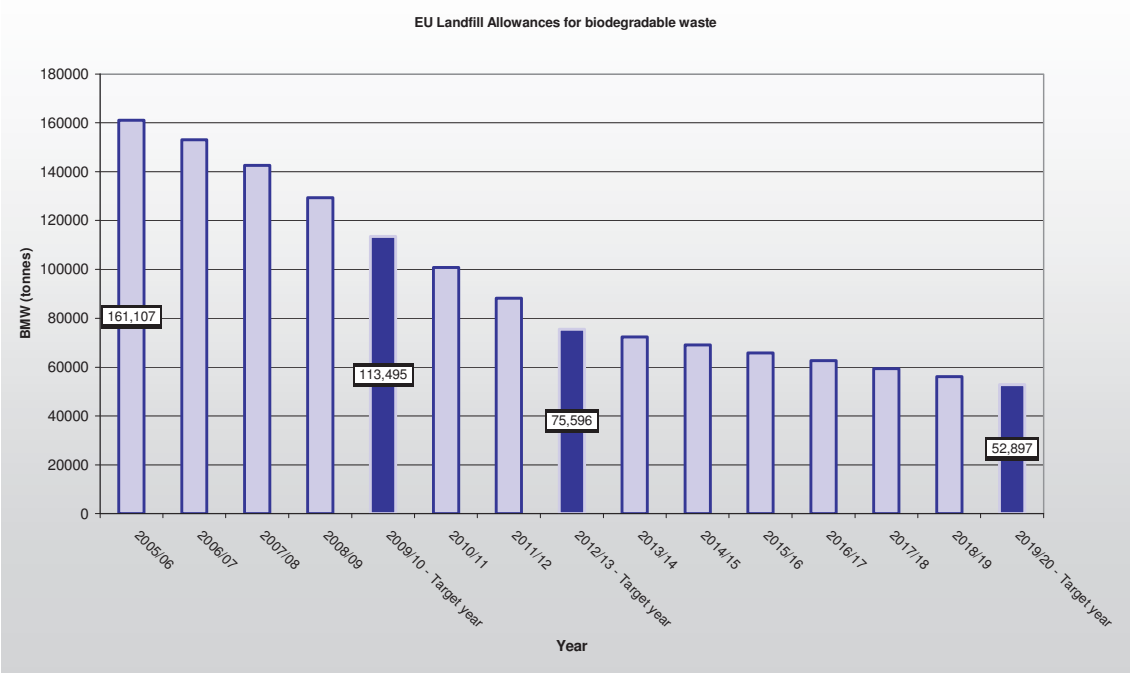

Figure 3: Landfill allowance allocation for Warwickshire County Council (DEFRA Feb 2005 figures)

Through the flexibilities of trading, banking and borrowing, authorities can develop the most cost-effective strategy for meeting their waste targets, tailored to their specific circumstances. However, disposal authorities that exceed their limit and cannot purchase any allowances will be fined £150 for every tonne they are over the limit. The implication of this is that most authorities will plan to meet these targets and therefore trading is likely to be minimal in the longer term although there may be potential for a market in the short term whilst infrastructure for waste treatment is developed.

The implications of the Waste Emissions Trading Act are discussed in Section 5.2.

2.3.7 Animal By-Products Order and Regulations 2003

As a result of the foot and mouth crisis in the UK, the Government amended the Animal By-Products Order in May 2001, which states that composting is not a permitted disposal route for any material that has possibly been contaminated by meat products. This prevents kitchen material from being composted in open windrows, even if vegetable material only has been targeted for a collection campaign.

The regulations also place restrictions on the use of compost material (that has been produced by material which has or may have contained meat products) on land where animals (including wild birds) may have access.

Implications for Warwickshire Authorities:
Source-segregated biowaste collected by Warwickshire's districts has to be treated in an in-vessel composting system under strictly controlled conditions. There are currently no facilities in Warwickshire which could process this type of waste.

2.3.8 Household Waste Recycling Act 2003

The aim of the Act is to increase recycling of household waste. The Act amends the Environment Protection Act 1990 and requires (with some exceptions) that English waste collection authorities (WCAs) should collect at least two types of recyclable material separately from the remainder of waste. The deadline for implementation is 2010.

Exception to compliance will apply where the cost of separate collection is unreasonably high or where comparable alternative arrangements are available (such as dense spreading of bring facilities serving flats).

Implications for Warwickshire Authorities:
The Warwickshire WCAs are already well on their way to meeting or exceeding the requirements of the Act. By the deadline of 2010, it is anticipated that all households in Warwickshire will have at least two recyclable materials collected from kerbside.

2.3.9 Waste Minimisation Act 1998

The Waste Minimisation Act enables local authorities to implement schemes to minimise the amount of controlled waste generated. The authority can:

"…do or arrange for the doing of anything which within its opinion is necessary or expedient for the purpose of minimising the quantities of controlled waste or controlled waste of any description, generated in its area."

The Act does not place an obligation on authorities to carry out such initiatives, nor does it allow councils to impose any requirements on businesses or households in their area. However they can determine both the form of collection and the receptacle from which waste is collected (previously enacted in the 1990 Environment Protection Act).

2.4 Strategic Partnership for Warwickshire 2005-2008

The Strategic Partnership for Warwickshire includes specific targets for waste reduction and recycling. The targets for waste reduction and recycling are:

- No increase from 2005-2008 of the kilograms of waste collected per head of the population
- Increase to 32% the total tonnage of household waste that is recycled by April 2008.
- Reduce the total tonnage of waste which is sent to landfill to 61% by 2008.

2.5 Waste Planning Policy and Guidance

Planning policy and waste management are inextricably linked. Planning has a significant role to play in determining the future infrastructure of waste management in the UK. Indeed, planning decisions made now and in the near future will influence whether or not the UK meet its BMW landfill diversion targets. The following policies and regulations have an impact on the planning of the future waste management in Warwickshire.

2.5.1 Planning and Compulsory Purchase Act 2004 and Planning Policy Statement 10

Significant changes have been made to the planning system which have been facilitated by the Planning and Compulsory Purchase Act 2004. The requirement to produce unitary, local and structure plans has been repealed and these will now be replaced by regional spatial strategies and local development documents.

Planning Policy Statements (PPS) generally set out the Government's national policies on different aspects of land-use planning in England. PPS10 is a waste management plan required by the Waste Framework Directive and it replaces the Planning Policy Guidance Note 10, *Planning and Waste Management,* which was published in 1999.

The objective of PPS10 is to provide a clear statement of Government policy on planning for sustainable waste management to regional planning bodies and planning authorities. It reinforces general guidance on process in PPS11 (*Regional Spatial Strategies*) and PPS12 (*Local Development Frameworks*). A collective objective of PPS10 and other relevant PPSs is to give guidance on achieving the objectives behind the Planning and Compulsory Purchase Act 2004. The key planning objectives set out in PPS10 are that regional planning bodies and planning authorities should prepare and deliver planning strategies with the aim:

- To make provision for the delivery and operation of sufficient waste management facilities in a way that protects the environment and human health; and
- To engage the community effectively in drawing up planning strategies in consultation regarding the planning for and provision of waste management facilities.

2.5.2 Regional Spatial Strategy

The Regional Spatial Strategy (RSS) for the West Midlands (formerly known as Regional Planning Guidance 11) was published in June 2004. The new Strategy seeks to promote the creation and development of sustainable communities across the region.

In addition to influencing the development and use of land in the region, the Regional Spatial strategy also informs the development of other strategies and programmes across the public sector such as health, education and crime reduction.

The Regional Spatial Strategy includes criteria for the location of waste management facilities within the region, which are in accordance with national planning guidance. As part of the development of the Regional Spatial Strategy, an estimation of the waste processing needs for the Region has been provided, which indicates the number and types of treatment facilities required in Warwickshire in order to meet future waste processing needs. Table 2 shows what facilities will be required in Warwickshire and the region as a whole by 2021.

Region	Recycling	MRF	Composting	Recovery	EfW
	Additional Capacity Required [1]	Equivalent number of MRFs [2]	Equivalent number of facilities [2]	Additional Capacity Required [1]	Equivalent No. Of EfW facilities [3]
Warwickshire	151	3	3	173	0.5
West Midlands	1524	22	30	1 106	3- 4

Table 2: Capacity requirements in Warwickshire and the West Midlands Regions

[1] Annual throughput capacity in '000 tonnes, required by 2021
[2] Required at 50, 000 tonnes pa
[3] Required at 300, 000 tonnes pa
Source: Regional Spatial Strategy for West Midlands

Each waste planning authority (Warwickshire County Council) is tasked with producing Local Development Documents which must adhere to the policies in the RSS. Local Development Documents will set out the local planning authorities plans for the development and use of land in its area.

2.5.3 Waste Local Plan – Waste Development Framework

In 1999 Warwickshire adopted its Waste Local Plan (WLP). The current WLP establishes preferred areas for the development of waste management facilities, which are considered necessary to meet Warwickshire's waste management requirements. Although the WLP does identify preferred sites for the development of waste management facilities, it is not wholly site specific and does allow a degree of flexibility regarding the location of facilities. The policy statements established in the WLP provide clear guidance on suitable and acceptable locations for waste facilities in Warwickshire.

Transitional arrangements mean that the existing WLP will be valid until September 2007. However the WLP will be progressively replaced by the Waste Development Document, consisting of a separate Core Strategy and allocation document. The Core Strategy will provide the framework for waste development control in the county until 2021 setting out a long-term vision, objectives and strategy for the development of waste treatment/disposal facilities throughout Warwickshire. The Waste Allocations Document, will provide detailed allocations for waste related development.

Combined with documents relating to minerals provision and extraction in Warwickshire the Waste Core Strategy document will make up the Minerals and Waste Development Framework, which will encompass the spatial strategy and planning policies for the county.

The documents have to make provision for all the waste streams arising in Warwickshire and not just municipal waste. Municipal waste makes up a relatively small proportion of the overall waste stream (estimated 7% of the total UK waste stream[2]).

2.5.4 Strategic Environmental Assessment Directive (2001/42EC)

The EU Directive on Strategic Environmental Assessment (SEA) was implemented in England and Wales in July 2004. The purpose of the SEA-Directive is to ensure that environmental consequences of certain plans and programmes are identified and assessed during their preparation and before their adoption. SEA will contribute to more transparent planning by involving the public and by integrating environmental considerations. This will help to achieve the goal of sustainable development.

SEA can be defined as the formalised, systematic and comprehensive process of evaluating the environmental impacts of a policy, plan, strategy or programme in the areas of land-use, transport, waste, water management, and energy. It must also assess the effects of reasonable alternatives to the plan. Furthermore a written report must be prepared on the findings of the evaluation. The requirement to monitor the environmental impacts associated with the implementation of plans and programmes is another important element of the SEA. This is intended to help identifying any unforeseen adverse effects at an early stage and implement remedial action.

The SEA Directive applies to plans, programmes and strategies whose formal preparation begins after 21 July 2004 and also those which are already in preparation by that date but will not be adopted or submitted to a legislative procedure by 21 July 2006. This applies to Warwickshire's Waste Development Framework but not the Waste Strategy as this was started and will be completed outside the dates specified by the Directive.

[2] Defra National Statistics 2005

3 WHERE ARE WE TODAY?

In order to develop a robust long-term Waste Strategy we have assess the existing baseline data and information and determine what impacts key drivers will have on waste management services in Warwickshire.

Key issues influencing the future waste management infrastructure:

- Growth of population and number of households
- Waste arisings

3.1 Background - Warwickshire

Warwickshire is situated in the heart of the midlands and is classified as being part of the West Midlands region. Warwickshire covers an area of 197,753 hectares. Warwickshire is bounded to the north by Staffordshire, Derbyshire and Leicestershire, to the east by Northamptonshire, to the south by Oxfordshire and Gloucestershire and to the west by Worcestershire. The county is split into five district areas:

- North Warwickshire
- Nuneaton and Bedworth
- Rugby
- Stratford-on-Avon
- Warwick

Warwickshire has a population of 519,301[3] and covers an area of 1,975Km^2 with just under a quarter of a million households. The bulk of Warwickshire's population lives in the north and centre of the county, which has traditionally been industrial, with towns such as Nuneaton, Bedworth and Rugby whose established industries include (or included) coal mining, textiles, cement production, and engineering. In the centre and west of Warwickshire lie the prosperous towns of Leamington Spa, Warwick, Kenilworth, and Stratford-upon-Avon.

The South of the county is largely rural and sparsely populated. The largest towns in Warwickshire as of 2004 are: Nuneaton (pop. 77,500), Rugby (62,000), Leamington Spa (42,300), and Bedworth (32,500).

[3] Based on 2003 population estimates

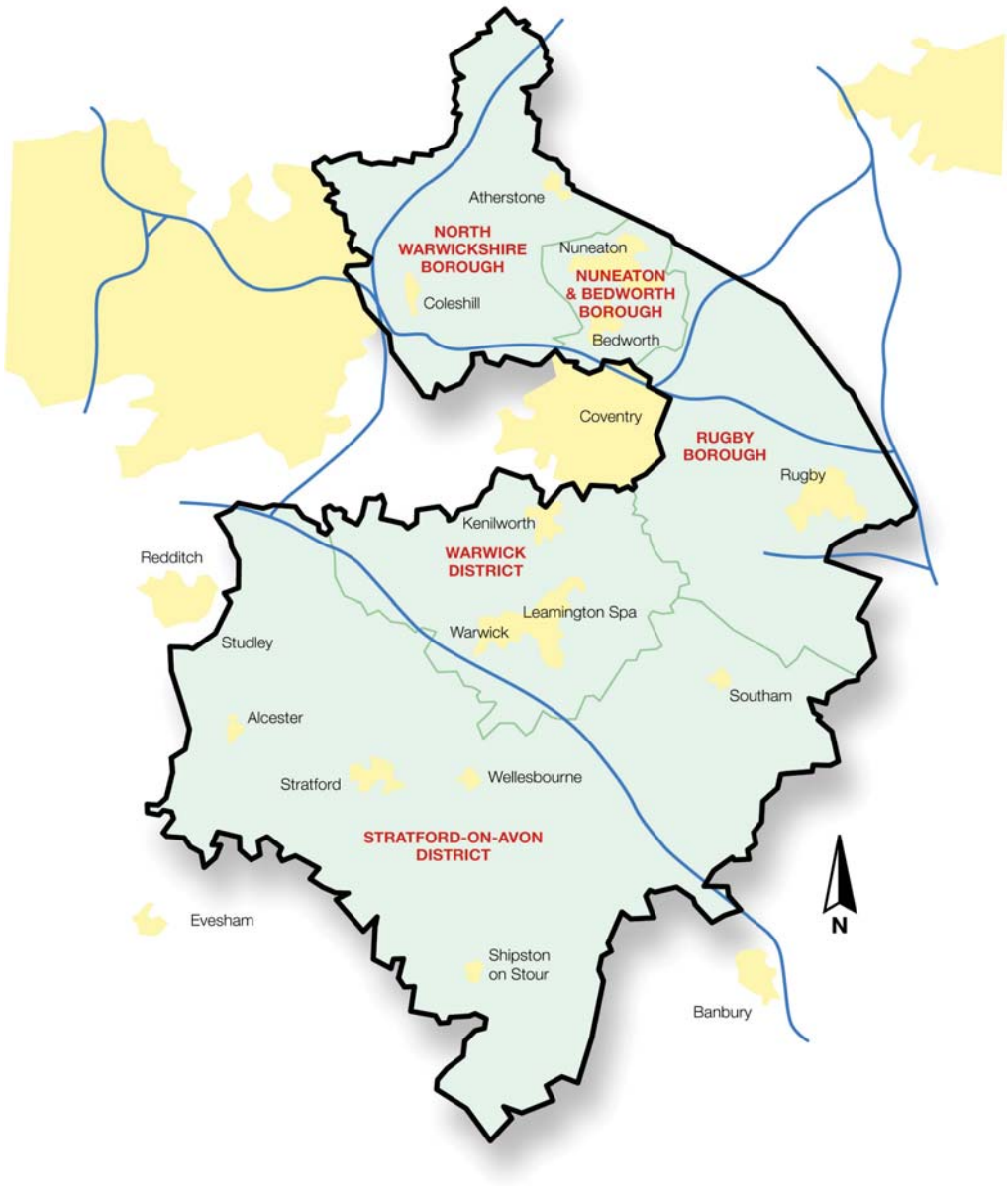

Figure 4: Districts and Boroughs in Warwickshire

Table 3: Population and household statistics

Area	Population	Number of Households
North Warwickshire	61,900	26,118
Nuneaton and Bedworth	120,300	51,410
Rugby	89,200	39,333
Stratford-on-Avon	115,200	47,000
Warwick	132,700	56,700
Warwickshire	519,300	220,561
West Midlands	5,267,308	2,219,893

Source: Census 2001, partly updated by Districts/Boroughs where figures available.

The population of Warwickshire has grown by 11% over the past 30 years and is projected to increase by a further 3.6% over the period of 2000-2010. The largest predicted growth over this period is in North Warwickshire followed by Warwick, Stratford and Rugby, however, population decline is projected in Nuneaton and Bedworth over the same interval. Table 4 shows these projections.

Table 4: Population prediction figures over the period of 2000-2010

	2000 Population (000's)	2006 Population (000's)	2010 Population (000's)	2000-2010 % Change
England	49,997	51,165	51,947	3.9
West Midlands	5,335	5,361	5,380	0.8
Warwickshire	510	521	528	3.6
North Warwickshire	61.8	65.4	67.2	8.8
Nuneaton & Bedworth	118.2	114.9	112.9	-4.5
Rugby	88.5	90	91.1	2.9
Stratford-on-Avon	115.6	119.2	121.5	5.1
Warwick	125.7	131.5	135.6	7.9

Source: Office of National Statistics.

The economic climate of an area is an influencing factor for the generation of waste. Gross Value Added (GVA) is a measure of the total economic activity in a region and provides an indication of the health of the region's economy. The table below provides a comparison of the GVA per head in Warwickshire, West Midlands and the UK from 1998 – 2002.

Table 5 - Warwickshire's GVA per head (figures in brackets show year on year percentage change)

Year	GVA per heard (£) Warwickshire	GVA per head (£) West Midlands	GVA per head (£) UK
1998	13,389 (7.9%)	11,830 (5.1%)	12,807 (6.0%)
1999	13,943 (4.1%)	12,246 (3.5%)	13,337 (4.1%)
2000	14,477 (3.8%)	12,716 (3.8%)	13,867 (4.0%)
2001	15,355 (6.1%)	13,285 (4.5%)	14,545 (4.9%)
2002	15,886 (3.5%)	13,803 (3.9%)	15,273 (5.0%)

Source: National Statistics, 2005

Warwickshire is ranked third behind Birmingham and Solihull in terms of per capita GVA. Between 1995 and 2002 the Warwickshire economy has grown by an average annual rate of 5.9%, which compares favourably with the UK average of 5.1% and the West Midlands figure of 4.6%.

3.2 Managing Waste in Warwickshire

The Warwickshire authorities have a collective, statutory responsibility to collect and dispose of municipal waste within the county. Municipal waste includes:

- Waste collected from households (domestic waste collection)
- Kerbside collected recyclables
- Kerbside collected garden waste
- Recycling bring banks
- Bulky household items
- Waste from household waste recycling centres
- Street sweepings and litter
- Trade waste collected as part of the domestic waste collection service
- Hazardous and clinical household waste
- Fly-tipped waste
- Waste from markets and educational establishments

The different responsibilities of WCAs and the WDA are summarised below in Table 6.

Table 6: Responsibilities of waste collection and disposal authorities

WCA Responsibilities	WDA Responsibilities
Waste collection	Disposing of waste collected by the collection authorities
Providing and managing mini-recycling centres (bring banks)	Providing large recycling centres (formerly known as household waste sites) for recycling and disposal of waste
Street sweeping and litter collection	
Providing kerbside recycling schemes	
Provision of trade waste collection service, (not all districts/boroughs provide this service)	
Recycling Waste	Recycling Waste

3.3 Waste Arisings

The overall arisings of all waste in England and Wales are estimated to be about 450 million tonnes per year, of which about 190 million tonnes per year represents controlled waste. Controlled waste is defined as waste from the following sources:

- Municipal solid waste (MSW),
- Waste arising from commercial premises,
- Waste arising from industrial premises, and
- Waste arising from construction and demolition (C&D) activities.

The other main sources of waste are agricultural wastes (which will become a controlled waste) and mining/mineral wastes.

It is estimated that there were 29.1 million tonnes of MSW generated in England in 2003/04 which represents about 6.5% of the overall waste arisings.

The estimated total arisings of controlled waste in Warwickshire in 2003/04 were about 1,202,000 tonnes, which means that arisings of controlled waste in Warwickshire represented about 0.6% of controlled waste arisings in England and Wales. Figure 5 shows the estimated proportion of controlled waste streams in Warwickshire. The municipal waste arisings of 297,000 tonnes represented about 25% of total controlled waste arisings in Warwickshire in 2003/04.

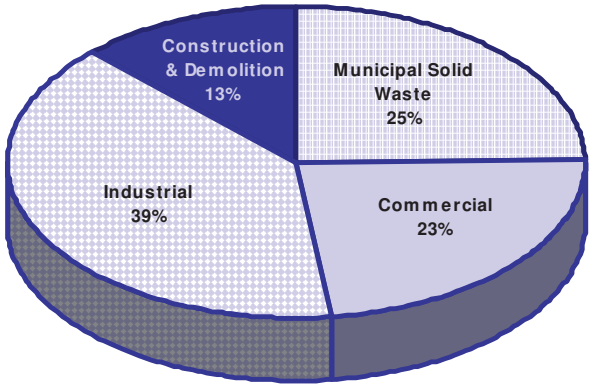

Figure 5: Estimated arisings of controlled waste in Warwickshire (2003/04)

Municipal solid waste (MSW) is defined as household waste and any other waste collected by the Waste Collection Authority or its agents including waste from park and gardens, trade waste and waste resulting from the clearance of flytipped materials. Household waste includes waste from kerbside collection rounds (residuals, dry recyclables and garden waste), Household Waste Recycling Centres (HWRC), bring schemes, bulky waste collection, hazardous waste collection and street sweeping.

Household waste currently represents about 70% of total MSW arisings in Warwickshire, while waste taken to HWRC sites (some of which is recycled) represented another 23% of MSW arisings. The other sources of MSW, such as litter, street sweepings, bulky household waste collections and commercial waste collected by local authorities represents a total of about 7% of overall MSW arisings. Figure 6 shows the waste arisings of the different waste streams since 1996/97 to 2003/04 indicating that overall the amount of waste has increased by 25% although no significant increase can be identified in a specific sub-stream.

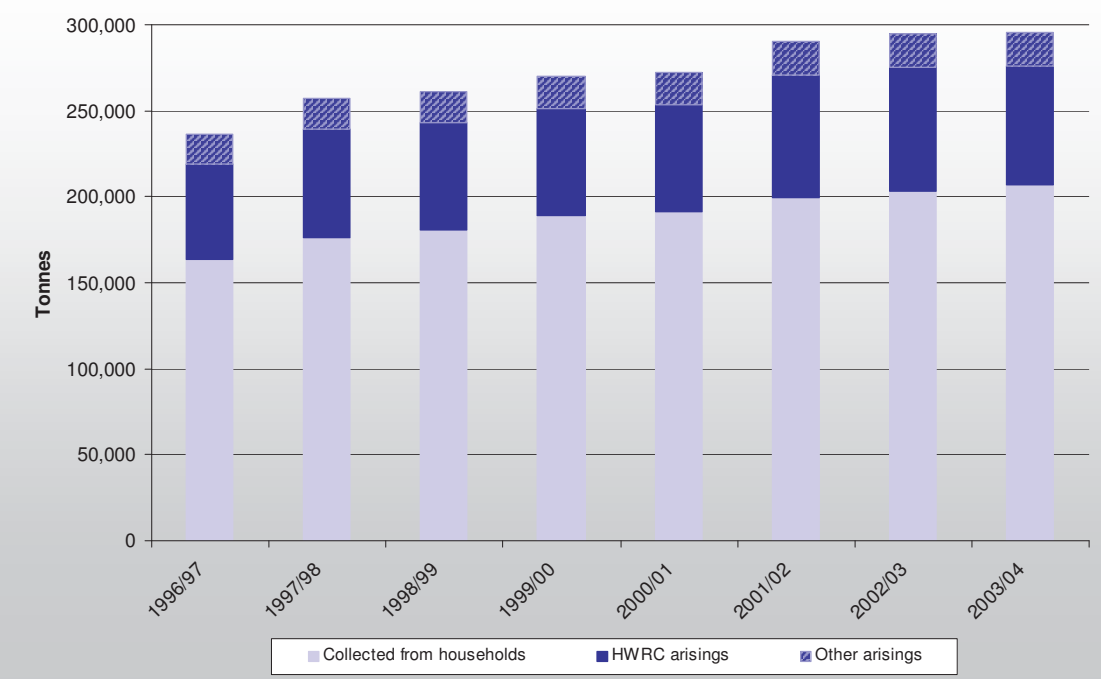

Figure 6: Sources of MSW arisings in Warwickshire (1996/97 to 2003/04)

Table 7 provides a breakdown of the total waste arisings generated in 2003/04 in Warwickshire. The total amount of household waste (including material from HWRCs) produced in Warwickshire in 2003/04 was about 269,393 tonnes. This represents a waste generation rate of 1.20 tonnes per household per year which is comparable to an average figure for England in 2002/03 of 1.19 tonnes per household per year.

Table 7: Total municipal waste arisings in Warwickshire (2003/04)

Districts/Boroughs	**Waste collected (tonnes)**
Total residual waste collected from households	167,678
Kerbside collected recycling	17,958
Kerbside collected composting	12,344
Bring schemes	5,727
Trade waste	8,409
Street sweeping	10,631
Bulky waste/other	507
Clinical waste	126
Total Districts/Boroughs	**223,381**
Warwickshire CC	
Household waste recycling centres (including C&D)	69,333
Third party recycling	265
Total Warwickshire CC	**69,598**
TOTAL Warwickshire CC & Districts/Boroughs	**292,979**

Figure 7 shows the total waste arisings by District from 1999/00 to 2003/04. This indicates that the amount of waste has increased in a similar rate across Warwickshire's authorities although Warwick District Council shows a slightly higher waste growth compared to the other authorities.

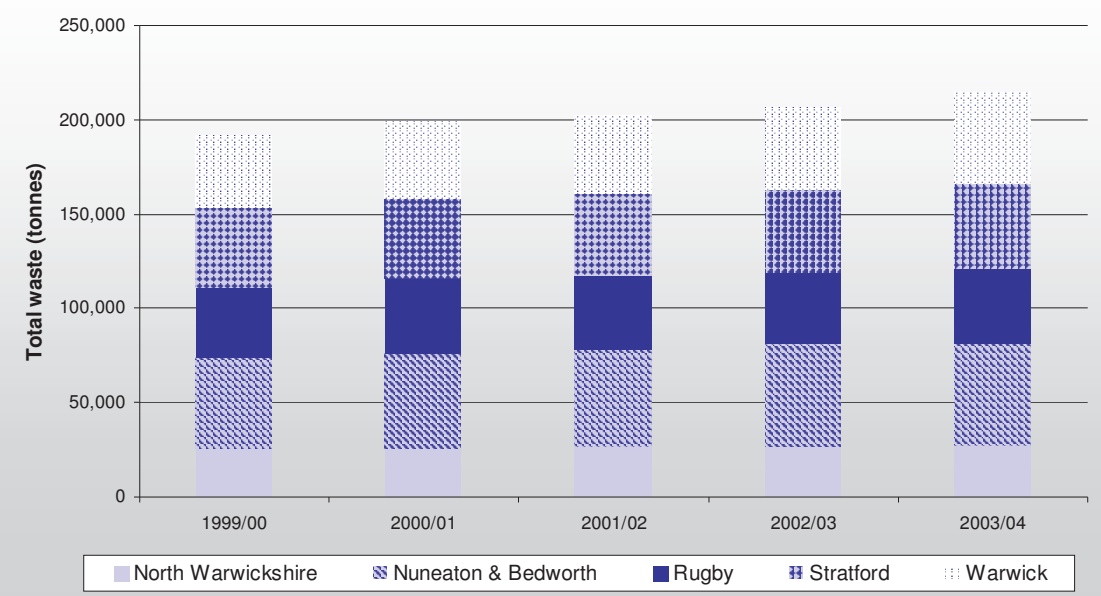

Figure 7: Waste arising in Warwickshire's authorities (1999/00 to 2003/04)

3.4 Waste Composition

As there is no specific data on household waste composition in Warwickshire, the composition of household collected waste (including material collected for recycling) has been derived from analyses conducted in another County in England with similar characteristics, where each Council is operating a three stream (dry recyclables, green waste and residual) collection. The composition of waste brought to Household Waste Recycling Centre (HWRC) sites was based on a survey of nine authorities in Wales. The estimated composition of each stream is shown in Figures 8 and 9.

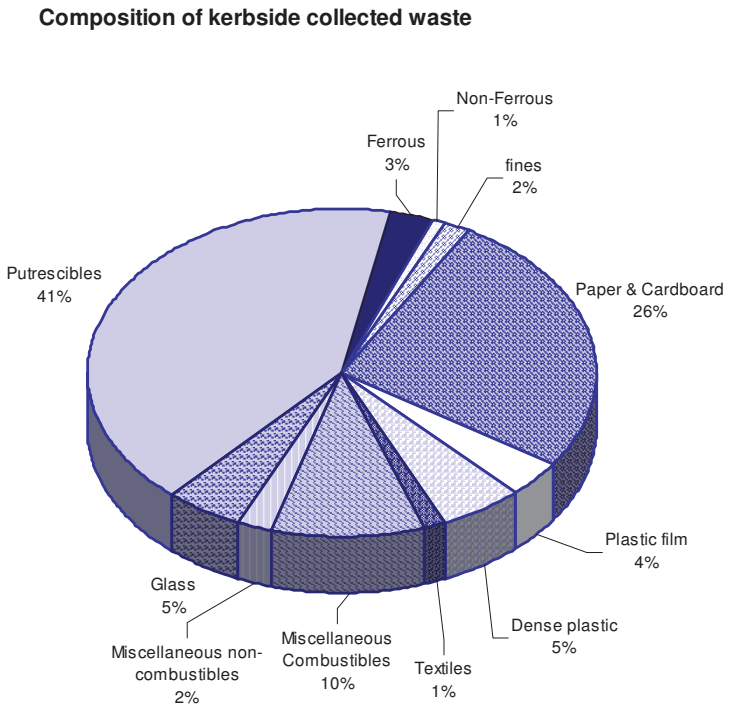

Figure 8: Estimated composition of kerbside collected waste in Warwickshire

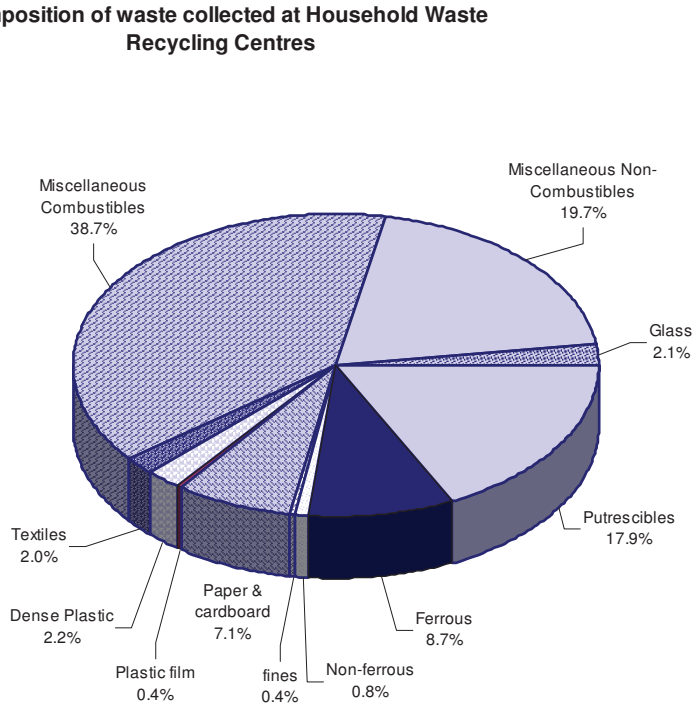

Figure 9: Estimated composition of waste collected at the HWRCs

4 CURRENT WASTE MANAGEMENT

The current waste management infrastructure needs to be reviewed to provide a baseline on which to develop the Waste Strategy.

Important sections of waste management infrastructure include:

- Waste collection service
- Recycling and composting
- Treatment and disposal of residual waste
- Existing contracts
- Current waste management cost
- BVPI performance

4.1 Collection

The two main sources of household waste are waste collected from the households (dustbin waste or so called residual waste) and waste taken to household waste recycling centres (HWRCs). In addition to collected household waste, the District/Borough Councils also collect trade waste, street sweepings and bulky waste.

The District/Borough Councils in Warwickshire collect domestic waste from households on a weekly basis, with households having their refuse removed on the same day each week. The collection arrangements for residual waste in each district, the choice of receptacles and the amount of residual waste collected from the households are shown in Table 8.

Table 8: Collection arrangements and amount of residual waste collected (2003/04)

	Collection arrangements	Total waste (tonnes)	Residual waste (tonnes)
North Warwickshire	Weekly collection from 26,118 households using 240 litre wheeled bins	31,707	22,273
Nuneaton and Bedworth	Weekly collection from 51,410 households using 240 litre wheeled bins	56,706	45,800
Rugby	Weekly collection from 39,333 households using 240 litre wheeled bins	42,465	32,428
Stratford-on-Avon	Weekly collection from 47,000 households. Sacks provided by district.	44,048	34,128
Warwick	Weekly collection from 56,700 households. No collection container or sacks provided.	48,456	33,049
Total	**220,561 households**	**223,381**	**167,678**

4.1.1 Side waste policy

Where wheeled bins are provided for the collection of residual waste the Warwickshire authorities have a policy of not taking side-waste (waste placed at the side of the wheeled bin and not inside the bin). They also require that the lid on the wheeled bin is closed. Waste that is placed outside the bin will not be removed for disposal.

4.1.2 Collection of Trade Waste

Trade waste is collected by three of the collection authorities; North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council and Rugby Borough Council. In Stratford and Warwick districts, businesses have to make their own arrangements with private waste contractors to have their waste removed.

4.1.3 Bulky Household Waste Collection

Bulky waste falls outside the scope of the regular weekly collection service as these items are generally too bulky or too difficult to be handled by the regular collection. Warwickshire District/Borough Councils collect bulky waste, such as cookers, mattresses on request from householders. A small charge is made for this collection service. Where possible, the materials collected are recycled or in some cases sent for refurbishment.

4.1.4 Street Sweeping and Litter

The Waste Collection Authorities provide a regular weekly service across the districts/boroughs. High use areas, such as shopping precincts usually have either permanent cleansing staff or daily cleaning regimes. All street sweeping and litter is currently landfilled

4.1.5 Clinical Waste

Clinical waste is defined in the Controlled Waste Regulations 1992. The term is applied to any waste, which consists wholly, or partly of:

- human or animal tissue;
- blood or bodily fluids;
- excretions;
- drugs or other pharmaceutical products;
- swabs or dressings; or;
- syringes, needles or other sharp instruments;

Which, unless rendered safe, may prove hazardous to any person coming into contact with it.

In addition, any other waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practice, investigation, treatment, care teaching or research, or the collection of blood for transfusion, which may cause infection to any person coming into contact with it.

There are stringent controls in place to ensure that clinical waste is managed safely and is recovered or disposed of without harming the environment or human health. Where requested, the Warwickshire authorities have a duty to collect clinical waste from households. However, this is not a standard service and will only be provided on request and a reasonable charge can be made by the authorities for providing the service.

There is a contract with a specialist contractor for the collection of clinical waste from Princes Drive waste transfer station, where it is sent to thermal treatment for disposal.

4.2 Abandoned and End of Life Vehicles

The Refuse Disposal Amenity Act 1978, places a duty on local authorities to remove and dispose of vehicles abandoned on public land within their areas. The Warwickshire Authorities work together and with the local police and Fire and Rescue service to ensure that abandoned vehicles are removed as quickly as possible from the roadside.

4.2.1 Warwickshire Car Clear Scheme

In June 2004, the Warwickshire Car Clear scheme was introduced as a joint partnership between the Warwickshire authorities, the Police and the Fire and Rescue Service. The aim of the scheme is to reduce the number of deliberate vehicle fires in Warwickshire by ensuring that vehicles abandoned in 'Arson hot-spots' or vehicles at risk from arson are removed from the roadside as quickly as possible. The scheme will have a positive effect on the environment and community safety.

Vehicles that are not in hot-spots or identified as an arson risk will be removed by a council appointed contractor to a vehicle storage compound. The vehicle is removed after a removal notice is affixed to the vehicle informing the owner that the vehicle is due for removal.

The removed vehicle, if in working condition, is stored at the vehicle compound while efforts are made to contact the owner. If this is unsuccessful, the vehicle may be sent to auction or is sent for de-polluting and disposal.

4.3 Collection of flytipped waste

Flytipping is a serious national problem as it can lead to serious pollution of the environment and harm to human health and it can cost large amounts of money to remove the waste. In addition, flytipping adversely affects the amenity of our local environments and reduces civic pride.

The amount of flytipped material varies from a single mattress or black sack to large volumes of construction, demolition and excavation waste. Some illegal dumps, while small in tonnage can be serious, particularly if hazardous waste is involved.

There are many reasons why flytipping occurs including just ignorance to a lack of awareness of the responsibilities for proper waste disposal. However, the Environment Agency has evidence to suggest that a lot of flytipping is organised by professional criminals who can gain significant financial rewards. It is anticipated that the incidence of flytipped hazardous waste will increase due to the recent introduction of restrictions on the disposal of hazardous waste. The Environment Agency estimates that there are around 50,000 fly-tipping incidents per year costing the authorities £100-£150 million to clear. To improve the accuracy of information

on the level of flytipping, a new reporting system has been established called 'Flycapture' and requires incidents of flytipping to be logged on a national database.

The Warwickshire authorities are working together and with other partners including the Environment Agency, the Police and neighbouring authorities to combat flytipping. A working group has been operational for several years with the aim of identifying a joint approach to reduce flytipping and increase prosecutions for flytipping offences in Warwickshire.

4.4 Recycling and Composting

Recycling schemes operating in 2003/04 are summarised in the table below. Each of the Districts operates kerbside collection schemes for both dry recyclables and green waste and also provide collection services for recyclables through bring bank schemes. Warwickshire County Council operates 9 Household Waste Recycling Centres (HWRCs) throughout the County, which collect both dry recyclables and green waste for recycling. Construction and demolition waste is also collected for recycling but currently cannot be included in the calculation of the household waste recycling rate.

In 2003/04, Warwickshire achieved a recycling rate of 21.5% which was well above the statutory target of 16% for Warwickshire County Council and an agreed enhanced target of 21%[4]. The recycling performance has been further improved and a combined recycling/composting rate of 27.6% was achieved in 2004/05. The continuous improvement of the recycling performance in Warwickshire is shown in Figure 10.Figure 10

Figure 10: Recycling performance from 1996/97 to 2004/05

4.4.1 Bring bank schemes

Table 9 shows the number of bring recycling sites in each District and the range of materials collected. There are currently 179 bring scheme sites located across Warwickshire, e.g. at supermarkets, car parks and shopping centres.

Table 9: Bring bank schemes in Warwickshire (2003/04)

	Number of sites	Materials collected				
		Paper	Glass	Plastic	Metal*	Textiles
North Warwickshire	35	✓	✓		✓	✓
Nuneaton and Bedworth	55	✓	✓		✓	✓
Rugby	59	✓	✓	✓	✓	
Stratford-on-Avon	12	✓	✓		✓	✓
Warwick	18	✓	✓		✓	✓

* Metals include aluminium and steel cans

[4] The Warwickshire authorities entered into a pubic service agreement with the Government, whereby for reaching an enhanced recycling target of 21% a performance reward grant was awarded.

4.4.2 Kerbside collection schemes

In 2003 all of the District/Borough Councils introduced new or extended existing kerbside collection schemes for recyclable materials. Table 10 lists the number of houses in each District/Borough covered by the kerbside collection schemes for dry recyclables and green waste. It shows that based on 2003/04 data, 93% of households in Warwickshire are covered by the dry recyclable collection scheme and 50% of households are included in the green waste collection scheme.

However, it should be considered that in order to improve recycling performance the participation of the public is needed. Surveys on participation rates have recently been undertaken, however, we are still awaiting the results. Door stepping campaigns will provide more information and aims to increase capture rates of materials and participation rates of the public.

Table 10: Summary of kerbside collection schemes and participating households (2003/04)

Kerbside Collection Scheme	District/Borough Council				
	North Warwickshire	Nuneaton & Bedworth	Rugby	Stratford-on-Avon	Warwick
Multi-material dry, including paper (fortnightly)	22,500	47,000	All H/Hs	All H/Hs	54,000
Green waste collection (fortnightly)	25,500	45,000	9,000	All H/Hs	24,000
Residual waste collection	Weekly	Weekly	Weekly	Weekly	Weekly

A detailed breakdown of each districts current and proposed services (until 2010) are provided in the recycling plans in Appendix A.

4.4.3 Recycling tonnages from bring schemes and kerbside collection

Table 11 shows the amount of material collected for recycling by each of the Districts in 2003/04 through their bring and kerbside schemes. The schemes collected over 36,000 tonnes in 2003/04. In addition, third party organisations, such as charity groups, collected and recycled a total of 265 tonnes of material in 2003/04.

All dry recyclables collected in bring schemes, kerbside collection schemes but also by HWRC sites are delivered to local reprocessors with some exceptions where no local company is available. However, Warwickshire authorities are regularly reviewing if local reprocessors can be identified can be identified in order to reduce the transport.

Table 11: Recycled material (tonnes) collected by the Districts in 2003/04

	Bring schemes	Kerbside dry recyclables	Kerbside green waste collection	Total
North Warwickshire	578	2,200	2,609	5,387
Nuneaton and Bedworth	1,041	3,040	1,406	5,487
Rugby	621	3,879	986	5,486
Stratford-on-Avon	1,728	5,185	1,146	8,059
Warwick	1,759	3,654	6,197	11,610
Total	**5,727**	**17,958**	**12,344**	**36,029**

4.4.4 Household Waste Recycling Centres

The County Council provides nine Household Waste Recycling Centres (HWRC) throughout Warwickshire which generally collect materials such as paper, cardboard, glass, garden waste, textiles, wood, metals, plastics etc. Information on what materials are collected at which HWRC can be found on the Warwickshire County Council website[5]. Table 12 shows the amount of material recycled at the HWRCs.

Table 12: Waste tonnage and recycling rates at HWRCs.

HWRC	Location	Total waste (tonnes) 2003/04 Excluding inerts	Total recycled (tonnes) 2003/04	Recycling (%) 2002/03	Recycling (%) 2003/04
Grendon	Spon Lane, North Warwickshire	5,636	2,012	19.3	35.7
Judkins	Tuttle Hill, Nuneaton	11,677	2,153	10.4	18.4
Hunters Lane	Hunters Lane, Rugby	8,584	3,093	37.0	36.2
Cherry Orchard	Pipers Lane, Kenilworth	6,192	2,869	37.0	46.3
Princes Drive	Princes Drive, Leamington Spa	12,219	6,639	50.0	54.3
Stockton [a]	Stockton	1,076	316	27.8	29.4
Burton Farm [b]	Bishopton Hamlet, Stratford	3,300	1,998	37.0	60.6
Wellesbourne	Loxley Road, Wellesbourne	2,639	1,056	38.2	40.0
Shipston	Brailes Road, Shipston	2,836	1,415	49.1	49.9
Total		**54,158**	**21,549**	**33.4**	**39.9**

a) Stockton HWRC is only open at weekends
b) Burton Farm HWRC was closed for redevelopment for 4 months in 2003.

These sites are currently recycling around 39.9% of the waste that is delivered to them. This is comparable to the national average for Household Waste Recycling

[5] www.warwickshire.gov.uk

Centres of 40%. The high performance of Burton Farm in 2003/04 has been attributed to its redevelopment, increasing user-friendliness and accessibility whilst also raising the profile of the sites importance for recycling. The 60% recycling rate attained has been described as the 'Best feasible recycling rate'[6] It is unlikely that Stockton will be able to achieve a 60% recycling rate as it is restricted both operationally and capacity-wise to what materials it can accept. However there is scope for the other sites to achieve higher rates of recycling.

Restrictions of Trade Waste at HWRCs sites
After the introduction of the Landfill Tax in 1996, there was an increase in the amount of trade waste disposed of at HWRCs. In an attempt to reduce trade waste abuse, Warwickshire introduced a county-wide van-ban. The policy essentially prohibits the acceptance of trade waste at all HWRCs in Warwickshire. The policy is reviewed regularly to take into account changes in legislation and vehicle choice and usage. The van-ban policy has been successful in reducing the amount of trade waste abuse at HWRCs.

There is a permitting system which allows members of the public whose only vehicle is a van to take household waste to the HWRC's. However, permits will only be issued to small car-derived vans. A weight limit is in operation which means that vehicles with a gross laden weight over 2,200kg are not eligible for a permit, therefore the policy excludes transit-type vans. Restrictions also apply to pick-up trucks exceeding the maximum weight limit.
Although trailers are allowed at all sites there is a restriction on the accepted size of the trailer. Trailers with a gross laden weight of over 750kg (the size over which the law requires the trailer to be fitted with a handbrake) are not permitted to enter the sites. Permits are not issued for trailers.

Trade waste or waste carried in a van can be taken to the county's two transfer stations, Princes Drive in Leamington Spa and Hunters Lane in Rugby, where a charge is applied for the acceptance of the waste. The rate charged depends on the weight of the waste and is set by the site contractors and is not governed by the County Council.

Trans-boundary use of HWRC sites
Although Warwickshire's HWRC's are strictly for the use of Warwickshire residents, sites are used by residents from outside the County. Certain sites, for example Grendon HWRC in North Warwickshire suffer more than others as it is close to the county boundary with Staffordshire and a significant proportion of the site users are from Tamworth. Currently we do not ask for proof of residence to allow householders to use the sites. Typically, residents will use the most convenient site irrespective of whether it is their area. It is generally accepted that HWRCs will be used by residents from outside Warwickshire, and Warwickshire residents will use sites outside Warwickshire. This does not currently cause a problem. If it became apparent that a site was being used predominantly by users from outside Warwickshire the situation would be reviewed.

[6] National Assessment of Civic Amenity Sites, Cameron-Beaumont et al, Future West, 2004

Household Waste Recycling Centre – Site Layout
The Warwickshire Authorities have a rolling programme to upgrade and redevelop the network of HWRCs. The demands put on these sites has increased dramatically over the past 5 years and upgrades of the sites are necessary to improve performance and make the sites easier and safer to use. Therefore the following steps have been undertaken to improve the site layout and to increase recycling levels:

- All sites have been re-branded from 'tips' or 'dumps' and the focus of the sites was shifted from disposal to recycling and reuse. The sites are now all referred to as Household Waste Recycling Centres.
- Signage at the sites have been improved moving away from the use of 'tatty' hand-written signs to a more uniform approach.
- Sites (such as the recently redeveloped Burton Farm, in Stratford) will incorporate a split-level design wherever practicable, which keeps service vehicles separate from the public. This type of design improves the safety at the sites and ensures a free-flow of traffic, therefore reducing congestion and queuing on the roads leading into the sites.

We are also improving the on-site 'shops'. The site in Stratford was the first in the country to have a purpose-built Recycling and Reuse Shop, which is operated on behalf of the County Council by a local charity. The partnership arrangement is very successful; it provides essential additional income for the charity, while increasing the reuse of items that would otherwise have been disposed of. We hope to increase the number of reuse shops and eventually have charities running shops on all of our sites. A second shop will open at Princes Drive in Leamington, early in 2006.

Operation of Household Waste Recycling Centres
Currently, all but one of our HWRC's are operated by sub-contractors on behalf of the County Council. The County Council operates one site although there is the potential to take over the management of further sites in the future.

All of the site operators are given recycling targets to achieve and are assessed against key performance indicators. To increase levels of recycling and overall performance a bonus scheme operates for enhanced recycling levels (over and above satisfactory performance).

4.5 Composting

The Warwickshire authorities currently send green waste to five composting facilities within the county and the surrounding area. Table 13 shows the locations of the composting facilities and the amount of material that they processed in 2003/04. All of the composting sites utilised are windrow-composting facilities and therefore are restricted to processing green waste only. Food waste can only be composted in approved in-vessel composting systems, which are compliant with the Animal By-Products Regulations 2003.

Table 13: Location of composting plants and tonnes processed (2003/04)

Composting plant	Location	Tonnes processed
Bubbenhall	Warwick	2,200
Gaydon	Stratford on Avon	12,600
Kilsby	Northamptonshire	2,600
Packington	North Warwickshire	700
Sibson	Leicestershire	4,100

4.6 Disposal

Landfilling is currently the main waste disposal route for waste in Warwickshire, although a small amount of waste is delivered to an Energy from Waste facility in Coventry. Most of the waste collected is transported directly to landfill. However, some waste collected by Rugby Borough Council is delivered to the transfer station at Hunters Lane which also handles the waste collected at the adjoining HWRC site. The transfer station at Princes Drive in Leamington Spa handles some waste collected in Warwick District Council and at the adjoining HWRC site. The location of waste treatment and disposal facilities used by the Warwickshire authorities is shown in Figure 11.

The Warwickshire authorities also send some waste for disposal at landfill sites in Staffordshire, Worcestershire and Leicestershire. The current input of waste to specific landfill sites by Warwickshire is provided in Table 14.

Table 14: Warwickshire's Waste input to Landfill

Area/District	Landfill Facility	Annual Input (tonnes) 2003/04
North Warwickshire	Packington (Sita)	2,182
Staffordshire	Wilnecote (Biffa)	14,436
Leicestershire	Cotesbach (Lafarge)	35,814
Nuneaton	Judkins (WRG)	75,235
Rugby	Bubbenhall (WRG)	53,440
Stratford	Ufton (Biffa)	38,910
Worcestershire	Hill and Moor (Severn Waste Services)	947
Total		**221,465**

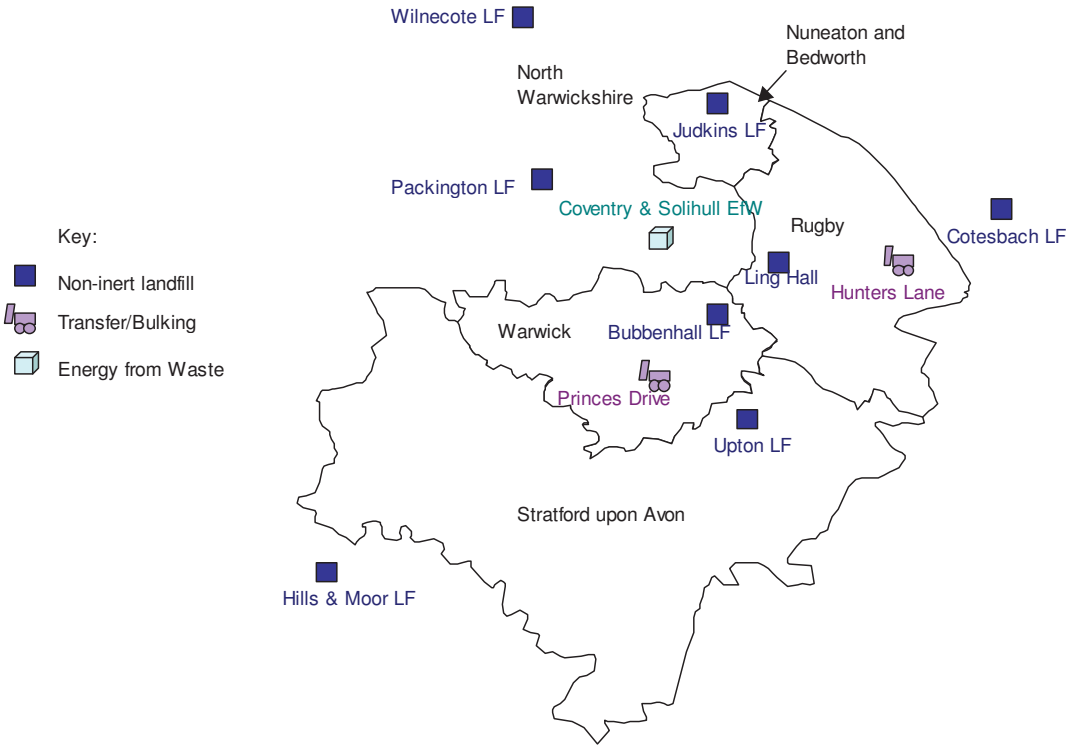

Figure 11: Locations of current landfills and disposal facilities

Historically Warwickshire has relied on landfill as its main form of waste disposal. However it has been estimated by the Environment Agency that the life expectancy of current landfill sites in Warwickshire to be approximately seven years. There is potential to release additional capacity, however this will be dependant on sites obtaining planning permission. This scenario can be seen throughout the West Midlands Region, as indicated in Table 15.

Table 15: Estimated landfill capacity and lifespan in the West Midlands region (based on existing sites and planning permission).

Waste Planning Authority	Voidspace on 01/04/01 ($000m^3$)	Capacity 01/04/01 ($000m^3$)		Biodegradable waste 2000-2001 (000s tonnes)	Life expectancy (years)
		Cap/Cover	Waste		
Herefordshire	100	40	60	0	0.00
Shropshire	7,062	2,825	4,237	670	5.27
Staffordshire	17,126	6,850	10,276	12.09	7.08
Warwickshire	21,807	8,723	13,084	1,484	7.35
West Midlands Met Districts	19,760	19,760	11,856	775	12.75
Worcestershire	10,660	10,660	6,396	554	9.62
Total	**76,515**	**30,606**	**45,909**	**4,692**	**8.15**

Source: Environment Agency, Local Waste Interrogator calculations 2004

Furthermore certain waste types are banned or will be banned in future from landfilling, e.g. tyres and co-disposal of waste is no longer permitted following the implementation of the Landfill Directive. This will have an impact of future landfill capacity for certain waste types.

The West Midlands has a high energy from waste capacity (EfW). The majority of the facilities are located within the Metropolitan area.

Table 16: Energy from waste capacity in the West Midlands

Location	Operator of EfW facility	Capacity (tonnes)
Coventry	Coventry & Solihull Waste Disposal	270,000
Tyseley, Birmingham	Onyx	350,000
Wolverhampton	Martin Engineering Systems	110,000
Dudley	Martin Engineering Systems	90,000
Stoke-on-Trent	Martin Engineering Systems	200,000
Total		**1,020,000**

The Warwickshire authorities currently send waste for disposal to the Coventry EfW plant. In 2003/04, 10,000 tonnes were disposed of at the facility. This represents slightly less than 3% of the total municipal waste arisings. Indications suggest that an additional 20,000 tonnes a year could be sent to the facility.

4.7 Existing Contracts

The Warwickshire Authorities have a number of disposal and collection contracts. Warwickshire County Council as the waste disposal authority currently has:

- Six disposal/treatment contracts
- Two contractors for the management of HWRCs
- Five composting contracts
- A contract for the collection and disposal of fridges
- A contract for the collection and disposal of clinical waste
- Agreement for the removal and de-pollution of abandoned vehicles
- Agreement for the removal and recycling of TV's, computer monitors and Fluorescent tubes

For further details of Warwickshire's treatment and disposal contracts refer to Appendix B.

The District/Borough Councils have separate contracts for the collection of refuse and recyclable materials. There is currently no integration between contracts of individual districts, however Warwick District Council and Stratford-on-Avon District Council are considering the potential for joint contracts when their current contracts end in 2008.

4.8 Current Waste Management Costs

The cost of waste management is split into two parts: cost for waste collection by the Districts/Boroughs (including collection and transport of recyclates) and the cost of waste treatment and disposal and the management of HWRC sites by the County

Council. The cost of services for 2003/04 is shown in Table 17 (all costs exclude landfill tax).

Table 17: Cost of services for waste management (2003/04)

	Total cost of waste collection and disposal	BVPI 86 (£ per household)	BVPI 87 (£ per tonne)
Waste Collection Authorities:			
North Warwickshire	£1.2 million	46.11	
Nuneaton & Bedworth	£2.0 million	37.40	
Rugby	£1.7 million	41.13	
Stratford-on-Avon	£2.7 million	53.68	
Warwick	£1.6 million	34.95	
Warwickshire County Council:			
Disposal (landfill and EfW)	£2.6 million		£30.80
Management of HWRC sites	£1.1 million		
Combined HWRCs + transfer station	£0.8 million		
Green waste composting	£0.4 million		

Therefore the cost of waste collection and disposal in Warwickshire in 2003/04 was £14.1 million. If landfill tax and other disposal service costs are included, this figure increases to £18.4 million and the approximate cost increases to £83 per household.

Figure 12 shows the upward trend in disposal costs since 1998. It is anticipated that the cost of waste management will increase significantly in the forthcoming years in order to comply with UK and EU targets for recycling, composting and landfill diversion. The cost remained similar in the last two years, because more waste was recycled and less waste had to be landfilled.

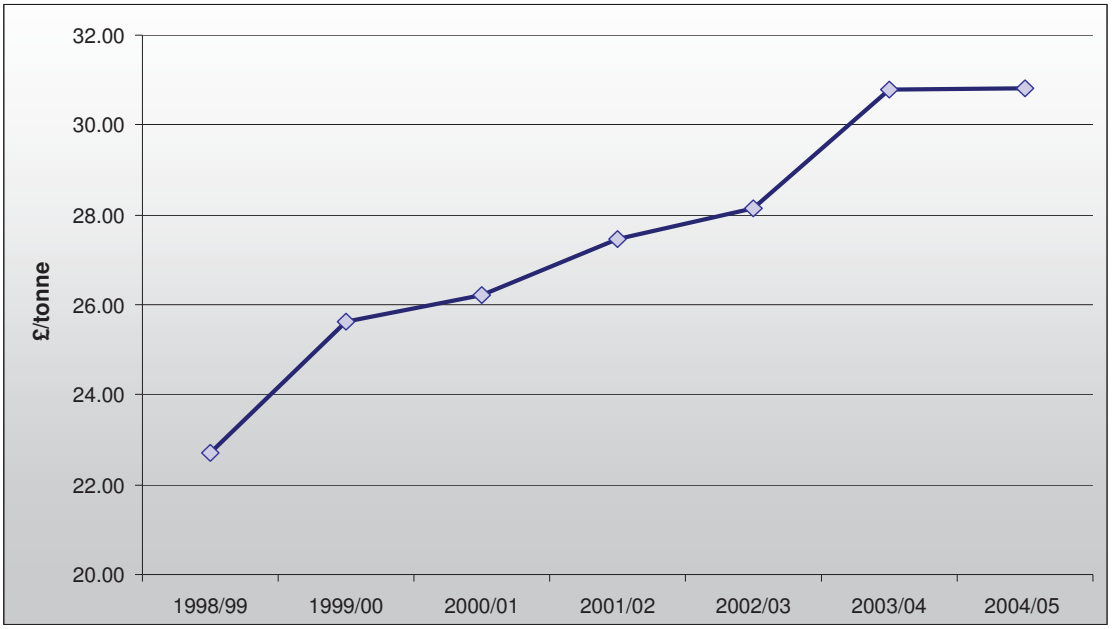

Figure 12: Increase of disposal cost (£/tonne) since 1998

4.9 What are we doing about our own waste?

The Warwickshire authorities are working to actively reduce the amount of waste that is produced through day-to-day council activities. We have schemes in place for recycling office waste and waste produced by other activities.

We are also looking at how we procure goods, adopting a 'whole life costing' approach to procurement to ensure that the most environmentally sustainable products are procured wherever practicable.

5 THE GROWING WASTE PROBLEM

- Waste generation is increasing by approximately 3% per year
- We have challenging landfill diversion targets to meet
- Failure to meet the targets will result in substantial fines
- What are the viable alternatives to landfill?

5.1 Projection of future waste quantities

As the UK population continues to grow, so do waste generation rates. The national growth rate for waste generation is approximately 3%. In Warwickshire the average growth rate for waste has been calculated at 2.4% taking into account the last 5 years (1998/99 to 2003/04).

It is notoriously difficult to predict trends in waste growth as it is subject to significant variation and can be influenced by many factors that are difficult to model, such as the weather. However it is necessary to try to provide an indication of future waste growth.

In order to forecast waste growth rate for the future, housing development and also waste minimisation activities should be considered. According to the Housing Policies of the Warwickshire Structure Plan, provision will be made for the phased release of land for the construction of approximately 31,100 new dwellings in Warwickshire over the period 1996-2011.

In the BPEO assessment for Warwickshire (Section 8.4) the number of new dwellings has been distributed equally over the 15 year time period. For the purpose of calculating data for the Strategy, the growth in the number of dwellings has been added to the growth rate for waste per household, which results in an overall growth in waste generation of 2.4%. Beyond 2012 it is assumed that the annual household growth rate will be 0.8%. Furthermore, it is assumed that the overall waste growth rate per household decreases in progressive steps to 2% by 2012 and 1.9% by 2020 due to the effects of waste minimisation and public education activities. It is essential that schemes are in place in order to achieve and sustain reductions in waste growth. Figure 13 illustrates the effects of the growth rate on the waste generation in Warwickshire comparing various growth rates.

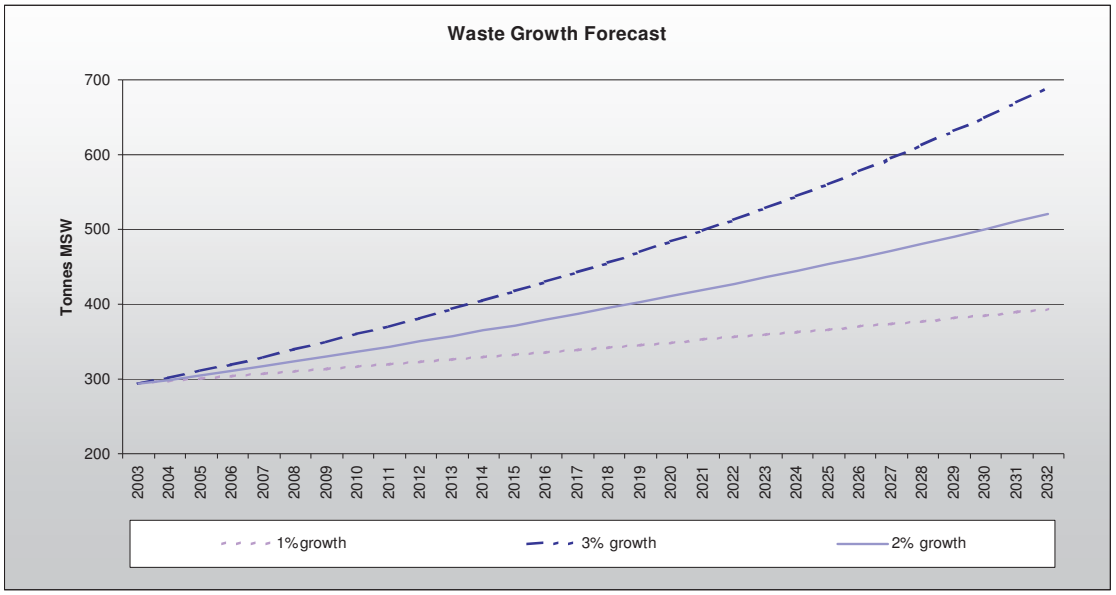

Figure 13: Effects of waste growth in Warwickshire

5.2 Implications for Warwickshire

Although the authorities in Warwickshire continue to increase the amount of waste that is recycled, we need to develop a waste strategy for future years that will enable us to:

- Meet any statutory recycling targets, which are set by UK Government (Warwickshire will achieve its 2005/06 average target of 24%). It is not yet known if the UK Government will set any further statutory recycling targets, but the authorities in Warwickshire have set a target to achieve a recycling rate of 40 - 45% by 2010.
- Reduce the amount of biodegradable waste that is landfilled in order to meet the requirements of the Landfill Directive and to meet the yearly landfill allowance targets, which have been set by the Waste and Emissions Trading Act.

The main challenge will be to meet the requirements set by the Landfill Directive on reducing the amount of biodegradable waste that is landfilled. The European Commission will be able to fine Member States (including the UK) who do not meet their targets, the level of this fine is currently 500,000 Euros (about £300,000) per day.

The UK Government has implemented the Landfill Directive through the Waste Emissions Trading Act. This spreads the responsibility for meeting the Landfill Directive target between all authorities, hence if every authority meets its target, the UK will not have to pay any fines to the European Commission. Each authority has been set a target for each year to 2020 based on the amount of waste it produced in 2001. The targets set for Warwickshire mean that we will have to reduce the amount of biodegradable municipal waste (BMW) landfilled from 146,200 tonnes per year (based on 68% of waste being biodegradable and total waste landfilled in

Warwickshire approximately 215,000 tonnes per year) to a maximum of 52,987 tonnes BMW per year by 2020.

The Waste Emissions Trading Act 2003 enables the UK Government to fine authorities, which do not meet their yearly targets. The level of this fine is expected to be £150 per tonne of waste above the allowance, and these fines will contribute towards the payment of any fines to the European Commission.

Although the UK will not have to pay any fines to the European Commission until 2010 at the earliest, the Waste Emissions Trading Act enables the UK Government to fine any authority that does not meet its yearly targets. Starting in 2005/06, however the Government has recognised that whilst some authorities are already easily meeting their allowances because they have installed a suitable treatment plant, other authorities, will not be able to meet their targets until they have both increased their current level of recycling and installed a suitable treatment facility. Consequently, the legislation enables allowances to be traded between authorities. The aim of the trading of allowances is to enable authorities to meet their obligations through purchasing allowances at a lower cost than the cost of paying a fine to the Government, but the cost of the allowances could approach the level of the fine if demand is high.

If the amount of waste continues to increase by an average of 2% per year between now and 2020, the total amount of municipal waste in Warwickshire will increase from its current level of about 300,000 tonnes per year to about 400,000 tonnes per year by 2020. Hence, if we maintain our current level of recycling and do not increase the amount of waste that is sent for disposal at the Coventry & Solihull EfW plant, the amount of waste to be landfilled would be about 300,000 tonnes in 2019/20 (which equals to 204,000 tonnes of BMW).

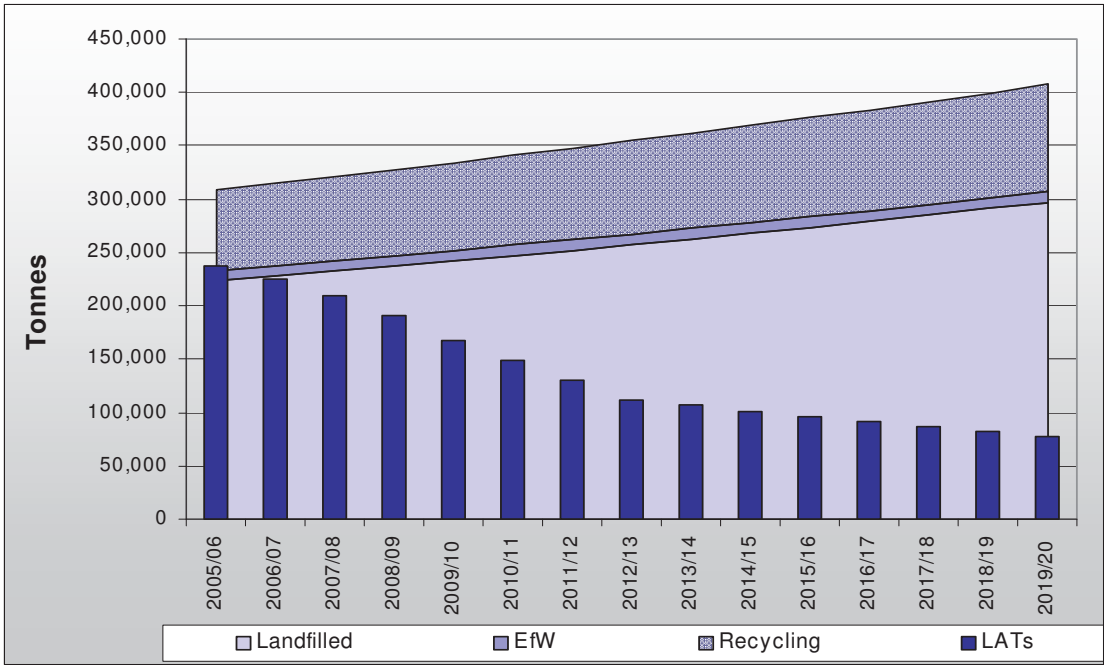

Figure 14: Proportion of recycled, recovered and landfilled waste

Warwickshire's maximum allowance for 2019/20 is 52,987 tonnes of BMW to landfill per year. Thus, we would exceed our allowance by about 151,000 tonnes in 2019/20, which means that the fine we would have to pay to the UK Government (if we were unable to purchase any allowances) would be £22.6 million (at the current rate of £150 per tonne). This is equivalent to an extra payment of £103 per household in fines in the year 2020 on top of the waste management cost.

This approach is not acceptable because:

- Warwickshire would not be making any contribution to meeting the targets for the UK set by the Landfill Directive.
- It would result in higher increases in Council Tax than approaches that reduced the amount of waste to be landfilled.
- Significant landfill capacity would be required. Landfill is not an infinite resource, and it has been estimated that Warwickshire has just over seven years landfill capacity remaining based on existing facilities with planning permission.

Therefore, Warwickshire will need to divert an additional 220,000 tonnes of waste from landfill by 2020 in order to meet Government targets without having to either pay fines to the Government or purchase landfill allowances.

6 HOW ARE WE GOING TO TACKLE WARWICKSHIRE'S WASTE PROBLEM?

To provide a focus and direction for the Waste Strategy, the Warwickshire authorities have identified preferred options for the long-term management of waste in the County. In making this difficult and critical decision the Warwickshire authorities agreed that our preferred options would enable the achievement of the following goals:

- To manage our waste in order to move up the waste hierarchy and work towards resource management versus waste management.
- To minimise the amount of waste generated in Warwickshire.
- To maximise the amount of material recycled and composted in Warwickshire and to meet and exceed our statutory recycling targets.
- To limit the amount of waste disposed of to landfill and to ensure that we meet our landfill diversion targets.
- To make use of existing waste treatment infrastructure in Warwickshire.
- To contribute to the generation of energy from a non-fossil source

6.1 Move UP the waste hierarchy and develop sustainable methods of waste management

Over 75% of municipal waste produced in Warwickshire is currently disposed of to landfill which is at the bottom of the waste hierarchy. Therefore we must curb waste generation and invest in treatment methods to move up the waste hierarchy adopting more sustainable methods of waste management.

6.2 Minimise the amount of waste generated

Waste reduction and reuse are at the top of the waste hierarchy and Warwickshire authorities are working with other regional authorities to promote waste reduction and reuse. We have set ourselves the target to reduce waste by not exceeding waste generation rates of more than 544kg per person. This is a challenging target as 556kg were generated per head in 2004/05 and we need to continue to provide education on waste and raise awareness of the problems associated with unsustainable waste growth. We will develop schemes and campaigns to compliment the national recycling message and to promote the fact that householder cooperation is the key to change.

Waste prevention and the reduction of waste at source is particularly important and home composting therefore has a pivotal role to play. We will continue to promote home composting and provide the education and support necessary to enable as many householders as possible to participate.

6.3 Maximise recycling and composting

The past five years have seen a radical change in how waste is collected in Warwickshire as each of the five District Councils have implemented significant changes to the collection services they provide. All of the District Councils in Warwickshire now provide kerbside collections for recyclable material and green garden waste. The success of these schemes is reliant on the support and cooperation of householders.

So far these schemes have had a significant impact on the amount of material collected for recycling and composting in Warwickshire and we are recycling and composting more material than ever before. However, we believe we could do better. Therefore the Warwickshire authorities intend to optimise the amount of material that can be recycled and composted, exceeding statutory recycling targets[7].

Warwickshire therefore strive to achieve countywide, enhanced recycling and composting rates of 40 - 45% by 2009/10. In setting these targets we acknowledge that there are many factors that affect recycling and that different authorities within Warwickshire will face different challenges attaining these levels. For example it can be difficult for very rural or urban areas to achieve high levels of recycling, which is why the targets are countywide and not applicable to each individual authority.

Achieving enhanced levels of recycling and composting will mean more changes to how waste and recyclables are collected. The most controversial will be potential changes to the collection frequency of residual waste. However, in order to achieve enhanced recycling and composting targets and to ensure that the service is economically viable, the Warwickshire authorities will have to seriously consider the introduction of alternate weekly collections of residual waste. Such a change would be complimented by an increase in the collection of recyclable materials and, wherever practicable, an expansion of the types of material collected. We are aware that the success of any 'new' method of waste collection will require significant involvement from the householder, with cooperation being essential to the success of any scheme.

We will also strive to increase the quantity and types of materials recycled at our household waste recycling centres. We have already reached a recycling and composting rate of 60% at Burton Farm HWRC in Stratford-upon-Avon. We are working to meet and exceed this target at our other HWRCs and a programme of works is in place to improve the facilities.

[7] Based on the current national statutory recycling targets which set the maximum recycling rate that needs be achieved at 30%.

The Warwickshire authorities are also committed to lobbying central Government to make changes to legislation in order to allow us the freedom to charge for waste collection, offer incentives to encourage recycling or make recycling compulsory. We will also lobby government to further reduce unnecessary packaging waste.

- Aim to achieve a countywide target of between 40-45% levels of recycling and composting.
- Recycle 60% at our Household Waste Recycling Centres.
- Lobby Government to introduce measures to encourage recycling & decrease packaging waste.

6.4 Limit the amount of waste landfilled

The introduction of the Landfill Directive has resulted in significant changes to waste disposal in the UK with the most significant requirement for Warwickshire to reduce the amount of biodegradable municipal waste (BMW) that it is disposed of to landfill.

We will need to covert waste from landfill in order to meet Government targets without having to pay fines or to purchase landfill allowances. In addition, landfill capacity is running out in Warwickshire and alternative disposal options have to be identified.

- Reduce our reliance on landfill, actively limiting input of biodegradable and non-biodegradable waste

6.5 Make use of existing waste treatment infrastructure

Since 1975, the Warwickshire authorities have sent waste for disposal to Coventry and Solihull Wastes' Energy from Waste facility. Currently just over 10,000 tonnes of waste per year is sent for disposal to the facility although we would like to increase our input into the facility, depending on the available capacity. Taking advantage of this increased capacity would be beneficial to the Warwickshire authorities with respect to ensuring that we meet our early BMW landfill diversion targets.

The increased use of the facility would essentially provide Warwickshire with some flexibility until the proposed new treatment facilities were operational. If we do not take advantage of the additional capacity we will run the risk of not meeting our early BMW targets.

- Increase our input of waste into Coventry and Solihull Waste's EfW

6.6 Contribute to generation of energy from a non-fossil source

The Warwickshire authorities are conscious that in accord with the principles of sustainable development, we should not consider waste management in isolation of other critical environmental issues. We are conscious of the seriousness of climate change and the resultant need to make a difference in the way we generate and manage energy.

The future Sustainable Energy Strategy for Warwickshire will focus on moving away from a reliance on fossil fuels and conventional energy generation methods towards an increase in the production and use of non-fossil sources of energy, particularly renewable energy sources.

There is a synergy between certain waste treatment technologies and the potential to contribute to energy generation in Warwickshire. The Warwickshire authorities will take this important factor into consideration when selecting a waste treatment technology.

- Contribute to the generation of energy from a non-fossil source in

6.7 Our preferred options

Taking all the factors into consideration, the Warwickshire authorities preferred options for the future management of waste in Warwickshire should include the following objectives:

- ⇧ To reduce waste at source.
- ⇧ To maximise recycling and composting – working towards achieving 40-45% recycling.
- ⇧ To increase inputs of residual waste into Coventry and Solihull's EfW facility.
- ⇧ To treat all remaining residual waste using a thermal treatment system – generating energy from a non-fossil source.

Although the Warwickshire authorities identified the above options as their preferred route for managing waste in Warwickshire it is imperative to demonstrate that the options are the most suitable from an environmental and sustainability perspective. Therefore, the Warwickshire authorities appointed independent environmental consultants to carry out an assessment of the Best Practicable Environmental Option (BPEO) for managing waste in Warwickshire. This is discussed in detail in section 8.

7 TACKLING THE WASTE PROBLEM - Waste Prevention, Minimisation and Reuse

Waste Prevention is at the top of the waste hierarchy and is pivotal to the development of sustainable waste management practices, hence waste prevention is a key part of Warwickshire's Waste Strategy. The following section shows the steps that have been taken to reduce waste in Warwickshire and our plans for ensuring that we continue to minimise the amount of waste that we produce.

7.1 How can we reduce the amount of waste we produce?

One of the biggest challenges that we have to face is the increasing amount of waste we generate. The amount of waste that we produce is increasing at an alarming rate. It has been predicted that waste will increase by between 2-3% every year.

Nationally and in Warwickshire we have started to take steps to ensure that we reduce the amount of waste we produce. National statistics indicate that these steps are having an impact, as for the first time in years the amount of waste produced nationally has decreased slightly.

Although the national trend is downwards, waste production in Warwickshire is on the increase. This is not sustainable and we need work actively to curb waste growth by promoting waste prevention, minimisation and reuse.

Key Issues

- To reduce the amount of waste generated in Warwickshire.
- To promote methods of reducing waste
- Promoting reuse
- To raise public awareness of waste

In other European countries householders are charged to dispose their waste by weight or volume. In England we do not have the statutory powers to make an individual charge for the collection or disposal of household waste. Clearly, if householders were charged for the actual amount of waste that they produced, it would have an effect on the amount of waste produced and material recycled. However, so-called 'pay-as-you-throw' schemes can be difficult to implement and are unlikely to be popular with the public.

Although Waste Prevention is at the top of the Waste Hierarchy, it has not been at the top of the waste agenda, the primary focus has been on recycling and disposal. However, household waste reduction and prevention offers a significant advantage over recycling (hence its position in the Waste Hierarchy) as it is not dependant on markets for recyclate and does not require expensive infrastructure. We need to work towards adopting a 'prevention' rather than 'cure' approach to managing our waste.

It is extremely difficult to quantify how much waste is 'prevented' from entering the waste stream or diverted by reuse initiatives. There are currently no targets for waste prevention or reuse.

7.2 Engaging the public

Participation of the individual householder is critical to the success of any waste minimisation and/or recycling scheme. It is also possibly one of the hardest hurdles to overcome. For many years we have existed as a throw-away society and have not given much thought to the waste we produce. To reduce waste without the use of incentives or dis-incentives will be extremely challenging.

Waste education and promotion is crucial to the success of any waste strategy. Without the full support of the public it will be virtually impossible to minimise waste and meet our statutory targets. The Warwickshire authorities recognise this and therefore are working together and with other authorities in the Midlands to develop initiatives to underpin their respective Waste Strategies.

7.3 National campaign – Recycle Now

The 'Recycle Now' campaign was launched in September 2004 and is the largest national recycling campaign to date. The campaign is high profile and has used recognised celebrities to promote specific events and support the overall campaign.

Supporting literature and promotional material has been produced specifically for local authorities to support the scheme.

Distinctive branding has been developed for the campaign, (depicted below). It is important that a campaign has easily recognisable branding so that we associate the symbolism with recycling. The ethos behind the campaign is to encourage and motivate consumers to recycle *'now and often'*.

recycle now

Figure 15: New recycling campaign logo

7.4 Local campaign - Recycle for Warwickshire

Warwickshire WasteWise was established in October 2001 as an initiative dedicated to reducing volumes of household waste within the County. Warwickshire's Waste Partnership manages the activities of WasteWise. The campaign is now officially called "Recycle for Warwickshire" and has adopted the national recycling identity and logo of 'Recycle Now'.

recycle for Warwickshire

Through WasteWise, the Warwickshire Authorities are working together to develop and implement schemes and initiatives that:

- Promote waste prevention and minimisation
- Encourage recycling
- Increase public awareness of waste issues
- Provide educational and support information

These schemes have been initiated by WasteWise and have contributed to the reduction of waste in Warwickshire and raising awareness of waste issues. The Warwickshire Authorities have been successful in obtaining funding from WRAP (Waste Resources Action Programme), through their Communications fund (£235,000 has been awarded) which will enable WasteWise to develop further campaigns until 2007/08.

Table 18 provides a summary of schemes (proposed and operational) that have been initiated by the Warwickshire authorities to promote waste reduction at source, reuse waste and educate the public on waste-related issues. A brief summary of each initiative, targets and details about proposed and current schemes is provided, including:

- ✓ Real Nappy Campaign
- ✓ Reducing waste in Schools
- ✓ Home Composting
- ✓ Home Wood Chipping
- ✓ Reducing Junk Mail
- ✓ A-Z of recycling

Some of the targets and schemes are short-term, however these will be reviewed as part of the next Strategy review and will be revised to reflect changes in legislation and policy. The Warwickshire Authorities will work towards developing a waste prevention and minimisation strategy, which will complement the waste strategy.

Table 18: Summary of proposed and operational schemes to promote waste prevention

Year	Action/Activity	Target(s)	How will this be achieved?
2005/2008	***General waste reduction*** Aim to reduce the amount of waste collected per head in Warwickshire	To reduce the amount of waste collected per head, not exceeding 544 kg per head	Through a series of waste prevention, minimisation and reuse schemes – detailed below.
2005/2006	***Real Nappy Campaign*** To increase the use of 'real' cotton nappies and reduce the number of disposable nappies entering the waste stream. Currently working in partnership with the George Elliott Hospital in Nuneaton.	To sign up 10% of new parents to the Cotton Nappy Campaign. Therefore reducing the amount of waste going into the waste stream by 667 tonnes per annum.	Increase partnership working with hospitals in Warwickshire.
2005	***Reducing waste in schools*** A toolkit has been developed to help schools identify where they can make savings and promote waste prevention, reuse and recycling in schools.	To reduce waste by 10% and recycle 25% of waste at all schools in Warwickshire.	Support and promote toolkit at all schools in Warwickshire.
2005/2008	***Home composting*** The home composting scheme has been operating since 2003.	12.5% of households across the county to be using compost bins by 2008. Estimated that it will reduce the amount of waste in the waste stream by 1%, which is equivalent to approximately 3,000 tonnes per annum (based on 300,000 tonnes total waste arising). It has been estimated that 150kg per household can be diverted from the waste stream every year by home composting.	Promote and support home composting scheme, (workshops) Monitor the effectiveness of home composting initiatives Provide the service to schools in Warwickshire.
2005/2007	***Home wood chipping*** This scheme has been operational since 2003.	To reduce the amount of waste going into the waste stream by 1,300 tonnes per year.	Maintain a free service for residents in Warwickshire. Continue to promote the free service to residents in Warwickshire.

2010	***Reducing Junk Mail*** The scheme started in 2003 where a postcard was included in the A-Z of recycling for householders. Residents were asked to join the mail preference service (MPS) and therefore reduce junk mail.	To get 50% of households in Warwickshire signed up to the MPS. Estimated that this will reduce waste by 0.2-0.4%, equivalent to 600 – 1,200 tonnes per year (based on 300,000 tonnes total waste arising).	Regular promotion of service.
2010	***A-Z of recycling*** Recycling directory sent to all households in Warwickshire 2003. Updates to Directory now on-line on the Warwickshire County Council website. www.warwickshire.gov.uk	To continue to review and provide up-to-date information on the web-based version of the A-Z.	Hard copies also available in libraries for those without web-access.
2005/2006	***Countywide doorstepping campaign*** Groups of waste advisors monitoring the participation rates in recycling schemes and providing advice to householders on recycling.	To increase participation rate in recycling schemes by 22% by March 2006. Over a period of 2 years (2007) increase the tonnage of recyclables collected by 30% (based on March 2004 figures, baseline of 56,000 tonnes). To reduce the level of contamination of kerbside schemes by 75% by March 2006.	Provide education and support for residents.
2005/06	***Waste Aware Shopping*** Aim is to change purchasing habits to reduce waste, e.g. selecting products with less packaging.	Estimated likely impact of scheme to reduce waste generated by 0.5-1% which means a reduction of 1,500-3,000 tonnes per annum (based on 300,000 tonnes total waste arising).	Will develop campaign and promotional material will be developed to complement information on the Council's website. www.warwickshire.gov.uk

2006	***Partnership working to reduce waste*** We will work in partnership to develop innovative schemes for reuse and recycling. The Warwickshire authorities have been instrumental in developing a Furniture Recycling Consortium in the County. The group consists of representatives from the community furniture recycling sector and officers. The Warwickshire authorities have secured funding for the group to employ a consultant to draw-up an official constitution for the group.	Estimated that furniture reuse/refurbishment scheme will reduce waste generated by 1 –2 %, which is equivalent to 3,000 – 6,000 tonnes per annum (based on 300,000 tonnes total arising). To establish a network of furniture reuse schemes throughout the county.	A partnership has been set up with the support of the Warwickshire authorities between Roundabout Group, and HMIP Onley to develop a scheme for white goods across the county. The white goods will be refurbished by HMIP Onley, and then redistributed to those in need by the Roundabout Group. The Warwickshire authorities are also working with the Christian Alliance Housing Association to develop a furniture recycling scheme to serve the north of the county. The scheme will both help the local community and reduce the amount of bulky household items entering the waste stream.
2005/2008	***Waste Prevention and minimisation Strategy***	To establish long-term goals and objectives for waste prevention and minimisation	With our partners develop a long term waste prevention and minimisation strategy

7.5 Partnership working to reduce waste

The Warwickshire authorities are committed to working in partnership with other organisations to promote waste minimisation, recycling and reuse.

One of the primary aims is to increase and strengthen relationships and working partnerships with the community and voluntary sectors who typically have zeal and enthusiasm for developing waste and recycling initiatives. They also have experience of encouraging and engaging the public in environmental issues, from which the Warwickshire authorities could benefit.

Strong links have been developed between the Warwickshire authorities and organisations operating furniture reuse schemes within the county. The Warwickshire authorities are also actively involved with schools to promote waste minimisation and recycling through an Eco-Schools project.

7.6 Regional campaign – Midlands Waste and Recycling Initiative

The Warwickshire Authorities have taken the lead in the establishment of a regional group, the 'Midlands Waste and Recycling Initiative', which consists of 14 authorities from throughout the Midlands.

Working together means that the scale and scope of awareness campaigns can be more extensive than if the Warwickshire Authorities were working alone. The first promotional activities of the group were a series of TV advertising campaigns with a recycling theme. Research showed that the campaigns were successful in promoting waste awareness within the targeted regions.

The innovative group approach to waste promotion has been recognised by WRAP, and consequently the group has been awarded a grant to carry out promotional activities.

7.7 Future challenges – Resource management

The challenge for the Warwickshire authorities is to continue to develop schemes and initiatives to contribute to reducing waste in Warwickshire, with the ultimate aim of working towards 'Resource Management' as opposed to waste management.

This approach has been pioneered in New Zealand, Australia and Canada and is a whole-system approach to the flow of resources through society based on the principle that waste can be eliminated by the efficient use of resources. It seeks to move away from managing to minimising waste. It encourages waste diversion through recycling and resource recovery advocating the elimination of waste at source and at all points down the supply chain. The concept aims to:

- Maximises recycling
- Minimises residual waste
- Reduces consumption
- Ensures that products are made to be reused, repaired, recycled or composted.

The approach encompasses the principles of sustainable development and advocates:

- Cleaner production (using less resources, creating less pollution)
- Product redesign so that products can be taken apart, and instead of being disposed of, the parts reused, recycled or composted
- Promoting reusable and recycled products
- Recycling or resource recovery.
- Composting.
- Implementing legislation including levies (taxes) that lead to producers and consumers paying the true cost of resource consumption
- Helping communities achieve a local economy that operates efficiently, sustains good jobs and promotes self-reliance
- Employment creation.
- Reducing spending on resources and waste management
- Reducing pollution by decreasing litter, greenhouse gas emissions and the burden of landfill remediation or contamination

Considering waste holistically and as a resource is the ultimate, ideal goal, achieving it will be extremely challenging. However it is a concept that the Warwickshire Authorities should seek to adopt. It is important not to become preoccupied with eradicating waste completely-achieving 'Zero waste' would be extremely difficult if not virtually impossible to achieve. Therefore resource management should be adopted as an approach to achieving sustainable waste management and not a target of absolute zero.

It is readily acknowledged that local authorities alone cannot achieve the aspirations of integrated resource management alone. It requires a radical change to how we manage and perceive waste, which is a national challenge. It is vital that industry is involved in the process if we are to have an overall impact on the amount of waste we generate.

7.8 Working with Businesses

Although the waste strategy is assigned primarily with providing a management framework for municipal waste the Warwickshire Authorities work together to provide advice and support on environmental issues to businesses. The aim is to promote sustainable practices for waste management and help businesses to improve their environmental performance.

The services offered to businesses include:

- Advice on improving profitability by reducing waste and improving energy efficiency
- Advice on recycling opportunities
- Assistance with environmental improvement projects
- Advice and audits to identify potential savings and areas of non-compliance
- Seminars and workshops on a range of environmental topics.

If we are to work towards resource management, it is essential that we continue to support and develop links with businesses within Warwickshire, promoting sustainable waste management.

8 TACKLING THE WASTE PROBLEM - Options for Waste Treatment and Disposal

8.1 The options we considered

The amount of waste which is landfilled can be reduced by either increasing the amount which is recycled or treating the residual waste to recover energy and products. Possible options for reducing the amount of landfilled waste to a level where we could meet the annual landfill diversion targets are as follows:

- Achieve a high level of recycling and landfill the remaining material without treating it. However, even if we were to achieve a recycling level of 60%, we would still need to either purchase allowances from other authorities or treat the remaining waste in order to meet our landfill diversion targets after 2013.
- Maintain or increase the current level of recycling, and send a high percentage of the remaining waste to an EfW plant in Warwickshire. Energy (as electricity) would be recovered from this waste and the ash would not count towards our landfill allowance, as it is not classified as biodegradable waste. It may well also be possible to recycle most of the ash as construction products.
- Increase the current level of recycling and significantly increase the amount of waste sent to the Coventry Solihull EfW plant. Although this plant currently has the capacity to process some additional waste, this capacity will reduce as the arisings of waste in Coventry increase. Thus, the Coventry plant would not be able to take sufficient waste from Warwickshire in the future unless the plant was expanded.
- Increase the current level of recycling and process the remaining waste using a treatment plant to segregate material suitable for recycling and composting. The residual material from the process plant would be landfilled.

In order to assist the process of identifying the best option for managing Warwickshire waste in the future, we conducted a number of studies. These were:

- A review of markets for materials produced by recycling/composting schemes.
- A review of markets for the products produced by residual waste treatment plants.
- A study to identify the Best Practicable Environmental Option (BPEO) for managing the waste.
- A review of treatment options for waste.

8.2 Market review

The review of markets for dry recyclables identified that they were well established, although achieving recycling rates of over 40% will require significant increases in size of markets for compost products. Markets for these 'higher' grade composts currently exist and have the potential to take significantly increased amounts in the future. The main uses would be for landscape/horticultural applications and for agricultural purposes.

The study identified that markets for the fuel and compost products generated by Mechanical Biological Treatment (MBT) plants will need to be developed in order for these plants to divert material away from landfill. Considering the implications for Warwickshire we aim to limit wherever practicable the disposal of waste and pre-treated waste to landfill. This is particularly applicable to the products generated from mixed-waste composting and anaerobic digestion (AD) systems. Processing mixed-waste in these systems produces a compost (and in the case of AD a liquid), however, due to the mixed nature of the feedstock, the resulting compost tends to be poor quality and is usually contaminated.

As a result, the markets for this type of material are limited. It is questionable as to whether a viable market is available for this type of material, indeed it is doubtful that it would be possible to give the material away for use in agriculture. Therefore the most likely route for this type of material is disposal to landfill.

Whilst a potential local market was identified for some of the fuel products that could be produced, it is very unlikely that this would have sufficient capacity to enable Warwickshire to meet its longer term landfill allowance targets.

Therefore, the Warwickshire authorities do not support the selection of a treatment process that generates products where sufficient market capacity may not be available. Therefore the only viable outlet would be landfill.

8.3 Possible treatment options

There are alternatives to landfill. Some of the technologies are essentially 'tried and tested' and have a long established track record of being used to treat residual waste in the UK. Other technologies have been used extensively in Europe, but only recently introduced in the UK or have been used to treat different types of waste. There are also new and emerging technologies, which are currently unproven in the UK and Europe.

The following table provides a summary of the main alternatives to landfill and their development status in the UK.

Table 19 Summary - Alternatives to landfill

Technology	Facilities operating in the UK
Energy from Waste	5 operating in the Midlands region
In-vessel composting	Yes – full scale
Anaerobic digestion	Yes-mainly for processing sewage sludge
Mechanical Biological Treatment	One operational – several under development
Gasification/pyrolysis	Pilot plant under development. No full-scale commercial plants

When considering the future waste treatment options for Warwickshire there were many critical factors that had to be considered. The main factors were:

Deliverability- Likelihood of a facility obtaining planning permission and being developed and operational within the desired timescale.
Reliability - The technology has a proven track record of operation and will perform as required.
Bankability – Banks, investors and insurers are prepared to finance and insure the development of the facility.

The following figure provides a summary of the alternatives to landfill and the products that can be produced by each treatment method (in italics).

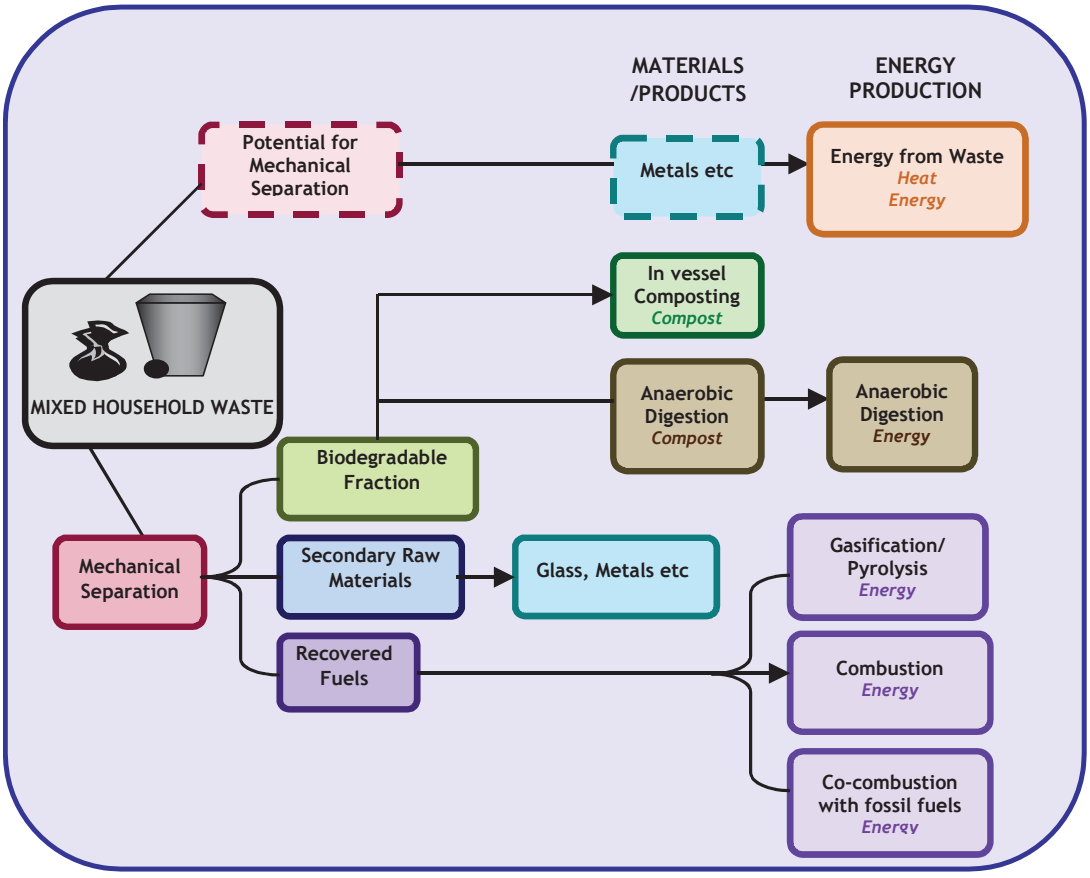

Figure 16 Overview of treatment options and products produced

The alternatives seriously considered by the Warwickshire authorities include a mixture of proven, 'new' and emerging waste treatment technologies. A brief description of each technology is provided in the following sections.

8.3.1 Anaerobic Digestion

Biodegradable material is processed in an enclosed vessel under controlled conditions. The material breaks down in the absence of air and produces a gas, liquid fraction and digestate (compost-like material).

The gas produced can be used to generate electricity, which can then be sold to the national grid at a higher tariff than conventionally generated electricity. Whether markets can be found for the compost-like digestate will depend on the quality of the material produced. It may be necessary to landfill this material if a viable market cannot be found. Rejects from the process will also need to be landfilled.

8.3.2 In-vessel Composting

Biodegradable material is processed in an enclosed vessel under controlled conditions. The material breaks down in the presence of air and produces compost.

Depending on the quality of the compost produced, markets may be found in agriculture or amenity horticulture, however quality is critical. If source separated waste is processed the quality of the final product will be better than if mixed waste is processed. It may be necessary to landfill the material if a viable market cannot be found. Rejects from the process will also need to be landfilled.

8.3.3 Energy from Waste (EfW)

Mixed, non-source separated waste is combusted under strictly controlled conditions, reducing the volume and hazardousness of waste material. This process can produce energy in the form of heat and electricity. Electricity can be sold to the National grid and the heat can be used in district heating schemes. Two types of ash are produced by the process, fly ash and bottom ash. Bottom ash can be used as a replacement for aggregate if a market can be secured, however fly ash currently needs to be landfilled in a specialist hazardous waste landfill site.

8.3.4 Gasification/Pyrolysis

Gasification and pyrolysis are referred to as advanced thermal treatment processes, they are separate processes but are often combined to improve combustion efficiency. They are not suitable for processing mixed, black bag waste, which will require sorting or pre-treatment before processing. The facilities are typically smaller than conventional thermal treatment facilities such as EfW.

Gasification and pyrolysis combust waste with a limited supply of air (gasification) or in the absence of air (pyrolysis) to produce a variety of products. Both processes produce a gas, which can be used to generate electricity, and sold to the National grid for an enhanced tariff. In addition to electricity, a carbon-rich material, char and oil (from pyrolysis) are also produced. There is the potential to use these products if a viable market can be found, otherwise they will need to be disposed of. As with EfW, the processes also produce fly ash, which will need to be disposed of at a specialist hazardous waste landfill site.

8.3.5 Mechanical Biological Treatment (MBT)

MBT is a generic term for a number of processes, which are combined to process waste. It can be used to process mixed, black-bag waste or source separated waste. MBT processes typically include a series of screens and conveyors to separate different fractions of waste (the same as a materials recycling facility MRF). The biodegradable fraction is then processed using anaerobic digestion or in-vessel composting technologies.

The products produced will be dependant on the configuration of the technologies used but can include; refuse derived fuel (paper, plastics etc), separated recyclables (metal, glass), compost-like material and if AD is used then electricity can be produced, which can be sold to the National grid for an enhanced tariff.

Whether viable markets can be found will be dependant on the quality of the products produced. If no viable markets can be found then the products will have to be landfilled.

8.3.6 Materials Recovery/Reclamation Facility (MRF)

Source separated or mixed waste (dirty MRF) is separated mechanically and in some instances by hand into different recyclable fractions e.g. glass, paper, plastic, and metals. Depending on the quality of the separated materials it is likely that a viable market would be found for the products.

The following table provides a summary of the processing capability of the waste technologies considered.

Table 20 Summary of processing capability of alternatives to landfill

Technology	Process mixed 'black-bag' waste	Process source-separated waste	Waste requires pre-treating before processing	Product still classified as biodegradable
Anaerobic Digestion	×	✓	✓	✓
In-vessel composting	×	✓	✓	✓
Energy from Waste	✓	✓	×	×
Gasification/Pyrolysis	×	✓	✓	×
MBT	✓	✓	×	✓

In some processes (in-vessel composting, anaerobic digestion and MBT) the final product is still classified as biodegradable even though it has been treated and would use up landfill allowances if landfilled.

Table 21 summarises the main advantages and disadvantages of each treatment technology. More details of each technology are provided in Appendix C.

Table 21: Advantages and disadvantages of treatment technologies

Technology	Advantages	Disadvantages
Steam treatment (including autoclave)	Range of potential markets for the main product A higher proportion of dry recyclable materials can be recovered for recycling.	Technology is not yet fully established. Markets are currently limited.
Gasification	Markets are available for the electricity which is produced.	Technology is not yet established with household waste.
Production of a refuse derived fuel (RDF) product	Technology is well established	Markets for the fuel product are currently limited
Composting	Composting is a simple technology and is very well established.	Markets for the compost product will be limited The compost may not be able to be included in calculation of the recycling rate.
Anaerobic Digestion	Markets are available for the electricity generated.	Technology not yet well established for household waste Markets for the compost product will be limited.
Energy from Waste	Technology is well established Markets are available for the electricity generated.	Public opposition Metal and ash can be recycled although it does not currently count towards recycling targets.

8.4 Identification of the Best Practicable Environmental Option (BPEO) for Managing Waste in Warwickshire

The process to determine the Best Practicable Option for managing waste in Warwickshire was conducted in 2005. The goals and objectives agreed by the Warwickshire authorities were used to develop a series of waste management scenarios, which were modelled to develop the BPEO for managing waste in Warwickshire, which is summarised in Appendix D. To represent a variety of possible waste management options that could be implemented in Warwickshire, the scenarios assessed were developed in consultation with Warwickshire waste management officers. The scenarios chosen are summarised in Table 22.

Table 22: Summary of Scenarios for Warwickshire

Scenario	Recycling	Residual waste collection	Residual treatment
Base Case A	40% incl. biowaste	Fortnightly	Landfill
Base Case B	40% incl. biowaste	Weekly	Landfill
1a - EfW centralised	40% incl. biowaste	Fortnightly	1x EfW (200ktpa)
1b - EfW decentralised	40% incl. biowaste	Fortnightly	2x EfW (200ktpa)
1c - EfW+30% recycling	30% incl. green waste	Fortnightly	1x EfW (230ktpa)
2 - Pyrolysis/Gasification	40% incl. biowaste	Fortnightly	1x Pyr./Gas. (200ktpa)
3 - MBT+RDF to 3rd party	40% incl. biowaste	Fortnightly	1x MBT (200ktpa)

The infrastructure to deliver these scenarios was evaluated and assessed against a range of criteria based on environmental, socio-economic and operational issues. Combining these assessments and applying weighting factors to reflect the relative importance of each criterion enabled overall scores to be calculated for each scenario. The weighting factors were developed from assessments by a cross-section of officers representing the five Districts/Boroughs and different departments of the County Council and the public (5 public consultation workshops). Table 23 shows the overall weighted performance of the seven scenarios assessed.

Table 23: Overall weighted performance

Objectives	Base case A – fortnightly collection	Base case B - weekly collection	Sc 1a - EfW	Sc 1b – decentral . EfW	Sc 1c – EfW + 30% recycling	Sc 2 – Gasific./ pyrolsis	Sc 3 - MBT
Environmental	12.82	13.05	33.15	33.54	43.77	38.69	23.05
Socio-economic	3.30	2.46	7.39	2.77	9.05	2.20	1.41
Operational	14.13	14.56	18.36	17.49	13.29	14.76	16.97
Total	30.26	30.08	58.89	53.81	66.11	55.64	41.44
Rank	**6**	**7**	**2**	**4**	**1**	**3**	**5**

The results show that diversion of waste away from landfill is the best option. Generally, energy from waste (EfW) plants score well because they benefit from the additional energy production offsetting the use of fossil fuel. The results highlighted the limitation of the MBT process with composting of the organic fraction, i.e. it does not produce any energy and it may be difficult to find an end market for the final product. This impacts its performance in the WISARD analysis and resultant environmental objective scores. Also the technology is sensitive to the determination of markets for the Refuse Derived Fuel (RDF) product and compost product that are yet to be identified or established.

This analysis shows that scenario 1c (EfW with 30% recycling) is ranked the highest. The scenario performs lowest in the operational objectives due to lower recycling level and a higher need for public involvement, (to achieve a recycling rate of 30% without the additional collection of kitchen waste will involve significant public participation), but it is the highest ranked option in both the environmental and socio-economical objectives. This is primarily due to the absence of in-vessel composting (IVC) facilities and therefore less environmental issues related to planning and overall reduced waste management costs associated with the IVC.

However, it should be acknowledged that scenario 1c requires high public involvement to achieve the 30% recycling when kitchen waste is excluded. The experience of Daventry District Council indicates that it may be possible to achieve a high recycling rate with garden waste collection, but the performance depends on local factors such as education, public awareness of recycling, type of housing but also the waste composition. A waste composition analysis can provide an indication of what recycling levels may be achieved with garden waste collected at the kerbside. However, scenario 1c is preferred due to its high level recovery (including recycling) and it is this factor which provides a larger benefit compared to the risk associated with the required public participation rate.

Furthermore, scenario 1c performs best, because it has the lowest overall cost of waste management which was ranked the most important criteria by the Warwickshire authorities. However, this result only emphasises the need to optimise the costs when selecting treatment technologies as long as the other key aspects that form the BPEO are taken into account.

Sensitivity analysis carried out on the scenario ranking does not alter the conclusions of the study, but it increases the differential of scenario 1c over the other thermal options, which can be seen in Figure 17. However, this result only emphasises the need to optimise the costs when selecting treatment technologies as long as the other key aspects that form the BPEO are taken into account.

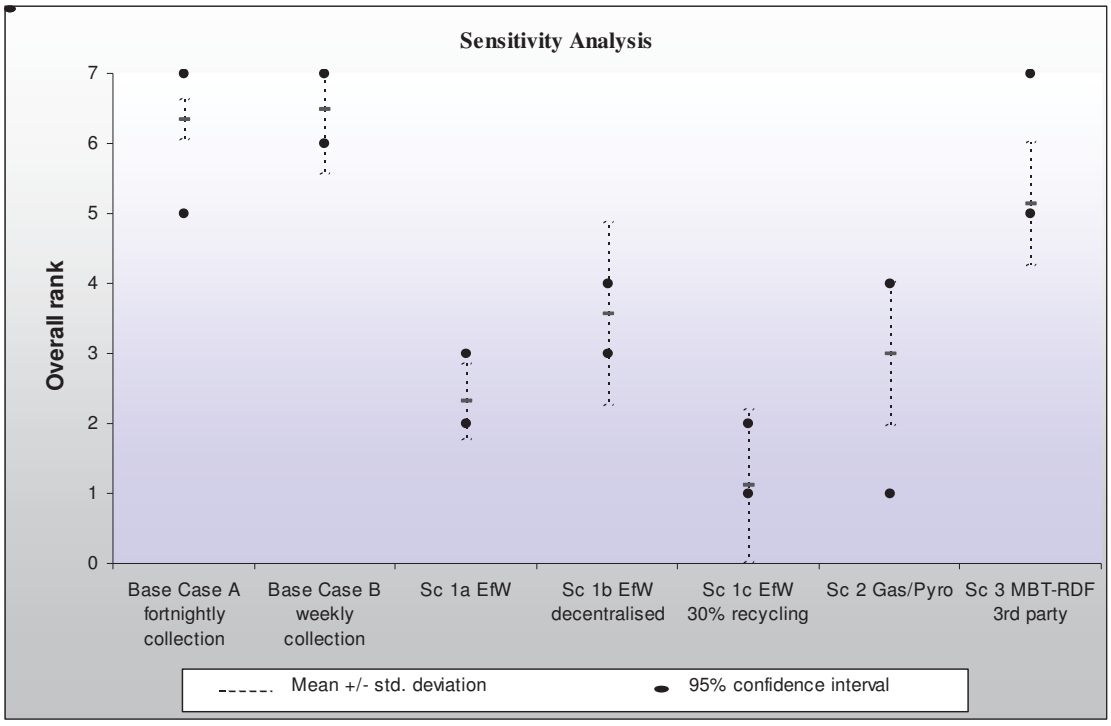

Figure 17: Variation in ranking during sensitivity analysis

A BPEO waste management solution is not necessarily one of the scenarios assessed, but the modelled scenarios are merely to illustrate the key policies that will be typified by the BPEO solution. Examination of the key aspects of the results

shows that the most important elements of a BPEO waste management system will include the following:

- The use of the smallest number of waste management sites for delivering the service.
- Maximising energy recovery – consequently through thermal treatment as this provides the most energy per unit of waste.
- Low overall cost of waste management (including collection and disposal).
- Reliable deliverability through the use of mature and established technologies.
- High potential for delivery (encompassing planning and public participation issues).
- Maximising the utilisation of waste in a beneficial manner (i.e. recycling or recovery of materials).

These aspects are expressed predominantly in scenario 1c (EfW with 30% recycling) although if higher recycling levels are required, kitchen waste collection may also be necessary.

However, the key aspects will be further considered in the procurement process for recycling and residual treatment technologies in order to provide the BPEO for Warwickshire. There are many other influences outside of this evaluation such as the ability of the market to deliver, additional funding options and the overall deliverability of any solution. Other funding streams (PFI, local performance agreements etc) are likely to be only supported if higher recycling is achieved and these funds may be sufficient to counteract the differences in this BPEO assessment.

9 TACKLING THE WASTE PROBLEM -The Future of Waste Management in Warwickshire

All waste treatment and disposal activities will have some impact on the environment. Therefore, a balance needs to be struck between measures to reduce or eliminate adverse environmental impacts and the costs of handling, treatment and disposal of waste.

The appraisal of the waste management scenarios (BPEO assessment) has been carried out to facilitate the structured comparison of a number of different treatment options for the management and disposal of waste in Warwickshire. This exercise has provided the Warwickshire authorities with an indication of the scenario or scenario components that are the most favourable on environmental and practical grounds.

Although the results of the BPEO exercise would suggest that Scenario 1c is the 'best' option (see section 8.4), the Warwickshire authorities have rejected it as the way forward for Warwickshire. It is important to acknowledge that even though Scenario 1c achieved the highest score, it is not necessarily the solution that Warwickshire should adopt, particularly as it only incorporates a recycling level of 30%. Public consultation indicated that residents would like to see more opportunities for recycling, composting and waste prevention and workshops clearly showed that Warwickshire authorities should aim for enhanced recycling targets. Therefore the Warwickshire authorities propose that the future management of waste in Warwickshire should encompass the following.

- Reduce the amount of waste produced in Warwickshire.
- Work progressively towards higher recycling levels, exceeding current statutory targets of 30%.
- Aim to reach aspirational countywide targets of between 40-45% recycling to be achieved by 2009/10.
- Limit the amount of waste disposed of to landfill – making use of existing waste treatment facilities e.g. Coventry & Solihull's EfW facility.
- After maximising recycling we will treat all remaining residual waste using a thermal treatment system – generating energy from a non-fossil source.

9.1 What does this mean for Warwickshire?

9.1.1 Waste minimisation and Re-use

The Warwickshire authorities have been actively involved in both local and regional waste minimisation and prevention initiatives, which have been successful in raising awareness of waste issues.

The Warwickshire authorities will develop a long-term waste prevention and minimisation strategy, which will set out the long-term plans for waste minimisation in Warwickshire. The Waste Prevention and Minimisation Strategy will complement the

Waste Strategy and will facilitate the achievement of the prime strategy objectives, namely to prevent waste generation and reduce waste in Warwickshire.

The Warwickshire authorities will:

- Continue to develop innovative campaigns to encourage waste prevention, minimisation and reuse.
- Continue to develop links with community groups, the voluntary sector and charities to establish partnerships to promote waste prevention and particularly reuse.
- Work with private sector/charitable institutions to provide door to door collections of alternative materials, such as shoes, mobile phones toner/printer cartridges etc.

9.1.2 How will Warwickshire reach the scheduled recycling targets?

The current upper recycling and composting rate set by the Government is 30% although it is likely that the Government will introduce new statutory recycling targets in the future.

However, the Warwickshire authorities are committed to exceeding national statutory targets and we have agreed to work towards stretched recycling targets with the aim of reaching a countywide recycling level of between 40-45% by 2009/10. In setting these targets, we are aware that there are factors that will affect the time taken and practical ability of all the Districts to reach these targets. It is accepted that socio-economic and geographical factors will influence an authority's ability to reach and sustain higher recycling targets. Nonetheless, the Warwickshire authorities will work in partnership towards achieving the stretched targets.

It is likely that the Government will introduce new targets for recycling in the future, however it is unlikely that they will be as challenging as the current targets set in this Strategy.

Over the past five years the Warwickshire authorities have made significant changes to the services that they provide and how rubbish is collected. The most significant difference has been the introduction of kerbside collection schemes for recyclable materials. However, the following schemes and initiatives are proposed by Warwickshire authority in order to increase recycling levels.

- Increase coverage of kerbside collection of dry recyclables
- Increase types of dry materials collected at the kerbside
- Increase coverage of green waste collections
- Implement separate collections for biowaste
- Target 'difficult' recycling areas, e.g. estates and flats
- Improve household waste recycling centre infrastructure
- Increase type of materials recycled at household waste recycling centres

Each District has considered schemes and potential changes in the collection service to improve its recycling performance. However, local factors need to be taken into account. For further details of each of the districts recycling plans please refer to Appendix A.

Kerbside recycling for dry recyclables
All five District Councils in Warwickshire provide a separate collection for recyclable materials. In order to reach the stretched recycling targets, all districts will work towards providing complete coverage in their areas wherever practicable. There will always be instances where it is not possible to provide a service (or service at the same level), however we will always endeavour to provide an alternative, whether it be provision of bring facilities or direction to a household waste recycling centre.

Two key materials that are logistically difficult to recycle, but that make up a very visible fraction of residual waste are plastic and cardboard. These two materials are very difficult to collect from the kerbside due to their bulky nature. However the Warwickshire authorities will consider other examples of best practice with the aim of developing kerbside collection systems for these materials.

Kerbside collection of green waste and biowaste
All Warwickshire authorities collect green garden waste from the kerbside although there is not full coverage in all of the districts.

It will be necessary to extend and optimise the collection of green garden waste to contribute to our enhanced recycling targets, wherever it is feasible to do so.

We also need to address another significant fraction of our 'dustbin' waste which is food waste or 'biowaste'. This can make up over 21% of the rubbish in a typical dustbin and is biodegradable, therefore it is important to identify alternative treatments other than landfill. Some types of food waste can be composted at home (typically uncooked, vegetable waste), however home composting is not suitable for all types of food waste.

To meet our enhanced recycling targets and critically our landfill diversion targets it will be necessary to collect biowaste separately from residual waste. Collecting it separately means that it can then be treated using an in-vessel composting facility to produce a potentially useful end product, compost. In order to contribute to our landfill diversion targets, it will be necessary to have separate collections and the treatment facilities for processing biowaste operational by 2008/09.

Frequency of waste collection
Currently, all of the collection authorities in Warwickshire collect residual waste weekly. Green garden waste is collected fortnightly and recyclables are collected fortnightly except in Nuneaton and Bedworth district where it is collected weekly.

In England, there are few local authorities currently recycling over 45% and they have usually adopted alternate weekly methods of waste collection.

As the name suggests, alternate weekly collection means that residual waste is collected one week and green waste and recyclables the next. Therefore residual waste is collected once a fortnight as opposed to weekly. There are many collection combinations that can be adopted, including fortnightly collection of residual waste and weekly collection of recyclables.

Alternate weekly collections increase the amount of materials recycled because it encourages householders to maximise recycling as the capacity in the residual waste bin in effectively reduced. It is generally accepted that alternate weekly collection systems increase recycling rates. They can also reduce collection costs, however this is not the case if the weekly residual waste collection is replaced by weekly collection of recyclables, as the collection costs would be similar. However, savings would be made on disposal costs as the waste would be recycled instead of being disposed of.

Changes to collection need to be coupled with a targeted information/education campaign to ease introduction. However it is likely that there will always be some individuals that refuse to participate. A great deal of effort is required to ensure that transition to alternate weekly collections are smooth and that contamination of the non-residual containers is minimised.
In order to reach our enhanced recycling targets, the Warwickshire authorities will need to consider if it is possible to achieve the enhanced recycling targets with weekly collections of residual waste.

Bring schemes
All of the districts provide bring facilities for recyclable materials, typically glass, paper, cans and in some instances textiles and some varieties of plastic. Despite the introduction of kerbside collection schemes for recyclables these facilities are still well used, particularly facilities located at supermarkets.

To promote and increase use of bring facilities, WRAP are working in conjunction with a number of supermarket chains to develop the “recycling centres of the future”. The banks use a reverse vending technique where it is possible to obtain coupons and vouchers for items recycled. If successful the banks could be rolled out across the country.

Estates and multiple occupancy buildings recycling
The Warwickshire authorities are working actively to provide recycling facilities for multiple occupancy buildings (sheltered accommodation) and purpose built flats, which do not have the space to accommodate individual recycling containers.

Recycling through voluntary groups
In order to promote and increase recycling the Warwickshire authorities will seek to develop closer links with the community sector and voluntary groups. These groups often have great enthusiasm for recycling and reuse and the Warwickshire authorities should foster this to help increase recycling in Warwickshire.

Household Waste Recycling Centres (HWRCs)
Currently, the recycling rates at our HWRC sites vary from between 33 –62%, but our target is to achieve recycling rates of 60% or above at all HWRC sites. This will be achieved in a number of ways:

- We have a rolling programme for HWRC's. As improved site layout and facilities have a positive effect on recycling.
- We intend to increase the number of reuse shops at our sites, which are operated by local charities. The arrangement provides essential income for the charity and also means that items destined for disposal are now reused.
- We encourage staff at the sites to adopt a customer-focused approach to recycling and to provide advice to site-users on what materials can or cannot be recycled.
- We will endeavour to increase the types of materials that can be recycled reducing the final amount of waste that requires disposal.
- We operate a bonus system where the sites are assessed against a number of key performance criteria. Increased recycling and reuse initiatives are then rewarded with a bonus. If operators perform to minimum requirements to operate satisfactorily, they are not awarded a bonus.

9.2 Requirements for new capacity

The three areas where additional waste handling/treatment facilities will be required by the end of 2011 are:

- Waste transfer stations
- Composting facilities
- Waste treatment facility.

Additional landfill capacity will also be required in the longer term.

9.2.1 Transfer Stations and Bulking Facility

At least one new transfer station for residual waste and a couple of smaller bulking facilities for dry recyclables will be required by 2009. The bulking facilities will be used for bulking recyclable materials prior to transport to markets. Residual waste collected by the District Councils will be transported via the Transfer Stations to the treatment facility and this will reduce both the number of journeys which are required and the cost for this operation.

9.2.2 In-vessel composting facilities

In order to increase the level of recycling to 40%, it will be necessary to collect food/kitchen waste from households for composting. However, whilst garden waste can be composted at the existing facilities, the requirements of the Animal By-Product Regulations (ABPR) require that food/kitchen waste (and any garden waste which is mixed with the food waste) needs to be composted in specialised "in-vessel" composting facilities. Three facilities, with a total capacity of 90,000 tonnes per year will need to be built in the Warwickshire area by 2009/10 if Warwickshire is to achieve its 40% - 45% recycling target by 2009/10.

9.2.3 Treatment and disposal facility for residual waste

In order to ensure that Warwickshire meets its future landfill allowance targets, a plant capable of treating up to 250,000 tonnes per year of waste will need to be constructed by the end of 2012. The results of the BPEO assessment indicated that treatment of Warwickshire's residual waste in an EfW facility would enable us to meet our targets. However, the rules for procuring the new treatment facility mean that whilst Warwickshire can specify that the successful contractor must meet Warwickshire's landfill allowance targets, and that the treatment plant must not compromise any further action that Warwickshire may take to increase recycling.

9.2.4 Cost Implications

Table 24 shows the estimated total cost for each of the scenarios which were considered in the BPEO assessment. This total cost covers collection of all waste streams, recycling and composting, waste treatment and disposal. The residual treatment facilities (EfW, gasification/pyrolysis and MBT) have been modelled to be operational in 2011. It has been assumed that 30,000 tonnes of residual waste will be send to EfW Coventry from 2009.

Table 24: Revenue cost for total waste collection and disposal (£m/y)

Scenario	2010	2015	2020
Base Case A - fortnightly collection	25.8	30.3	33.2
Base Case B - weekly collection	26.1	30.8	33.7
Sc 1a - EfW	25.8	29.2	31.9
Sc 1b - EfW decentralised	25.6	31.3	34.2
Sc 1c - EfW 30% recycling	25.6	28.4	31.1
Sc 2 - Gasification/ Pyrolysis[8]	25.8	31.7	34.7
Sc 3 – MBT	25.8	31.9	34.9

The equivalent cost in terms of estimated payments per household in 2015 is indicated in Table 25. This is based on the assumption that the number of households increases from the current level of 220,000 to approximately 249,000 households as modelled for the BPEO assessment (discussed in Section 5.1).

Table 25: Estimated cost of waste management per household in 2015.

Scenario	£ per household
Base Case A - fortnightly collection	122
Base Case B - weekly collection	124
Sc 1a - EfW	117
Sc 1b - EfW decentralised	126
Sc 1c - EfW 30% recycling	114
Sc 2 - Gasification/ Pyrolysis	127
Sc 3 – MBT	128

The current costs of our waste management services are equivalent to about £83 per household (as discussed in Section 4.6). Table 25 shows that total costs (collection and disposal) for waste management are set to rise substantially. Furthermore, it should be noted that potential costs for monitoring, education and awareness raising programmes are not included in the estimated cost of waste management.

[8] Revenue cost for gasification/pyrolysis includes pre-treatment

9.2.5 Potential locations for future waste treatment facilities

Warwickshire has a Waste Local Plan (WLP) that was adopted in 1999 and which is valid until 2007. However, we are in the process of updating the WLP which will be referred to as the Waste Development Document (WDD). As sections of the WDD are produced and agreed they will supersede the WLP and finally replace it in 2007.

The current WLP specifies some preferred locations for the development of waste treatment facilities although it is not wholly site specific and does allow a degree of flexibility. The policy statements outlined in the WLP provide clear guidance on suitable and acceptable locations for waste facilities within Warwickshire.

The WLP sets a preference for the development of waste management facilities such as a Materials Recycling Facility on industrial estates, on land of new or established waste disposal facilities, or land which has been used for a commercial activities and where the proposed use would be compatible with adjacent land uses.

Locations which are identified in the WLP as suitable for waste treatment facilities are listed in Table 26.

Table 26: Locations identified in WLP

Location	Type of Facility
Ufton landfill site	Materials Recycling Facility
Griff (No 4) quarry	Materials Recycling Facility
Packington landfill site	Materials Recycling Facility
Kingsbury brickworks, quarry and landfill site	Materials Recycling Facility
Kingsbury Brickworks Quarry	Landfill
Brandon Lane	Open Windrow Composting

A strategic environmental assessment (SEA) must be undertaken within the development of the WDD for Warwickshire as described in Section 2.5.4, which will include full stakeholder and public consultation. However, before any new waste treatment facility can be developed, planning permission must be obtained on the proposed facility even though the location may be listed in the WDD. In order to achieve planning permission for a waste treatment facility a site specific environmental impact assessment must be undertaken which includes also a certain amount of public consultation.

9.3 Continuing stakeholder involvement

For our strategy to be successful it is essential that we have the support of the public and stakeholders. Therefore, throughout the development of the Waste Strategy we have consulted key stakeholders (including representatives from the waste industry) and the public on our proposals.

The first phase of consultation was carried out in 1999/2000 where changes to kerbside collections of rubbish and recyclables were the main topics for discussion. It was after this first consultation exercise that the Warwickshire authorities began to implement changes to waste collection, and introduced the kerbside collection schemes that we are now familiar with.

The first consultation concentrated primarily on options to increase recycling and only briefly discussed waste treatment and disposal options. The second consultation that ran throughout January and February 2005, focused on our preferred options for future waste treatment and disposal in Warwickshire.

Key stakeholders and the public were invited to attend a series of workshops to discuss our proposals. A consultation leaflet and questionnaire was also produced, which was widely distributed throughout Warwickshire and sent directly to workshop attendees.

The results of this exercise showed support for the council's preferred approach and support for higher levels of recycling. Participants also made a number of suggestions on ways in which the services could be improved and recycling increased, (there is a supporting paper on the outcome of the consultation process, further details are in Appendix G).

9.3.1 Sustainability appraisal

The draft waste strategy and final waste strategy have undergone an independent sustainability appraisal. The assessment was carried out by Forum for the Future, who assessed the strategy against eight different sustainability criteria.

Forum for the Future commented that:

> *"The Waste Strategy has the potential to contribute positively to delivering sustainable development by using the waste hierarchy as a framework and seeking to exceed statutory composting and recycling targets…The Strategy has employed a robust and transparent process to assess several scenarios and reach a best practice environmental option. It clearly demonstrates how weighting has been set in a consultative manner and scores arrived at with good appropriate discussions."*

9.4 Education and Information Campaign

One of the key messages to come out of the consultation on the draft strategy was that it is critical to keep key stakeholders and the public informed of our plans and what they will actually involve. Therefore to support the implementation of the Waste Strategy the Warwickshire authorities will be engaging in an education/information campaign to explain why it is so critical that we increase the amount of material that we recycle and also invest in new treatment facilities for processing waste.

9.5 Timetable

With the forthcoming landfill diversion targets looming ever closer, it is essential that we begin to implement the key aspects of the Waste Strategy. If we do not start the implementation stage of the strategy, we face the prospect of not meeting our landfill diversion targets and associated with that are significant fines from the Government and possibly the EU.

Procurement of any type of waste treatment facility is a time consuming process and takes a number of years. Acquiring planning permission is the main key factor as

delays in the planning process can significantly delay the procurement process or halt it completely.

Table 27 lists the key steps involved in the procurement of a treatment facility. It should be noted that the dates are for illustrative purposes only and are meant to provide an indication of the likely timescales involved in procurement.

Table 27: Key steps in the procurement process

Description	Delivery Date
Agreement on the funding route/method for the construction and operation of the treatment plant(s)	30/3/2006
Agreements on the development and use of existing local waste processing facilities	2/6/2006
Purchase/lease sites on which to build the treatment plant(s)	2/6/2006
Planning permission for waste treatment plant(s)	30/11/2006
A contract to design, build, finance and operate the treatment plant(s)	30/11/2006
A contract with the District/Borough Councils for guaranteed input for the treatment plant(s)	30/11/2006
Consultation with stakeholders	1/12/2006
Licences/permits to operate	31/7/2008
In-vessel composting facilities to be operational	2008/09
Additional Transfer Stations to be operational	29/10/2010
Waste Treatment Plant(s) to be operational	2011/12

For further information Appendix E provides a summary five-year plan, which highlights the actions we need to take to implement the waste strategy.

9.5.1 Risk assessment

The waste hierarchy encourages reducing the amount of waste which is produced, increasing the level of recycling, and recovering value from the residual waste. Thus, whilst the Waste Strategy should follow the aims of the waste hierarchy, the Warwickshire authorities have to ensure that the strategy adopted can be delivered and does not expose the Council to unacceptable risk.

There are risks associated with the waste stratgey. The main risks are discussed below along with their impacts and possible solutions/mitigation.

9.5.2 Waste growth differs to that which is predicted

Waste Growth could increase above or decrease below the rate predicted, which would have an implication on the treatment capacity required and associated costs.

If waste grows at a higher rate, the overall cost of waste management will rise due to more waste requiring processing. In addition, there is a risk that facilities may be unable to handle the additional tonnage. This may mean that Warwickshire would be at risk of not meeting their landfill diversion targets as unprocessed waste would be disposed of to landfill.

If waste does not grow at the predicted rate, it would be easier for Warwickshire to meet its targets. However, the cost per tonne of dealing with any residual waste

would increase as treatment facilities would not be used to full capacity, and therefore the overall cost would not be reduced pro rata with reduced tonnages.

Warwickshire may be able to reduce the impact of variations in waste growth by passing any associated risks onto a contractor as part of a contract. But it is unlikely that the private sector will accept this risk without substantial payment.

9.5.3 Cost implications if recycling level is not achieved

The Warwickshire authorities are seeking to move towards higher recycling rates and therefore all scenarios (except 1c EfW 30% recycling) in the BPEO assessment have been modelled with the districts achieving 40% recycling by 2010. The implications on the overall waste disposal costs should be considered and the risk assessed if the anticipated 40% recycling level is not achieved or not maintained in the long-term. More residual waste will have to be diverted from landfill and subsequently Warwickshire will exceed the available processing capacity of the residual treatment facility to meet their targets.

Figure 18 shows the implications on disposal costs if the anticipated recycling rate of 40% is not achieved. This sensitivity analysis considers only the impact on disposal costs, because the impact on collection costs can vary depending on the factors for failure within the recycling schemes. For example, the recycling performance may be lower than anticipated, because the required participation rate cannot be achieved or maintained. However, the recycling schemes have been implemented and cost incurred, therefore the collection costs remain although the recycling target will not be achieved. Alternatively, recycling schemes may not be implemented as planned due to budget constraints which may result in lower collection costs.

Assuming £100/tonne for landfill allowances, Figure 18 illustrates that the range of disposal costs for both scenario 1a (40% recycling) and scenario 1c (30% recycling) are broadly similar. By 2010, scenario 1a shows the lowest disposal cost when compared to scenario 1c which is modelled at a lower recycling rate of 30%. This is due to the fact that landfill diversion targets are only narrowly missed with the higher recycling level. However, if the recycling target of 40% is not achieved by 2010, more landfill allowances will have to be purchased. In the BPEO assessment it was assumed that a residual treatment facility will be operational by 2011 and therefore the disposal cost may decrease depending on the market value of the landfill allowance (further discussed in Section 9.6.6). Nevertheless, in the long-term the disposal cost will increase over time, if the recycling performance does not achieve 40%.

Generally it should be considered that the anticipation to achieve higher recycling levels contains a financial risk through the technical performance risk of not being able to meet the target. The capacity of residual treatment may not be sufficient and additional landfill allowances may have to be purchased. However, if a lower recycling target is planned to be achieved by Warwickshire, the financial risk will be transferred into a political risk. The political risk is the reputation of the authority with its residents and peers for failing to strive for best practice recycling rates and this will include evaluations such as Comprehensive Performance Assessment and Best Value reviews. At a more pragmatic level the public opposition to any residual waste treatment facility will be greater as the facility will be seen to be larger than necessary

and therefore exacerbating any of the perceived negative impacts. This could lead to problems with planning and could well result in planning failure which would have substantial financial impacts through delay in meeting landfill diversion targets.

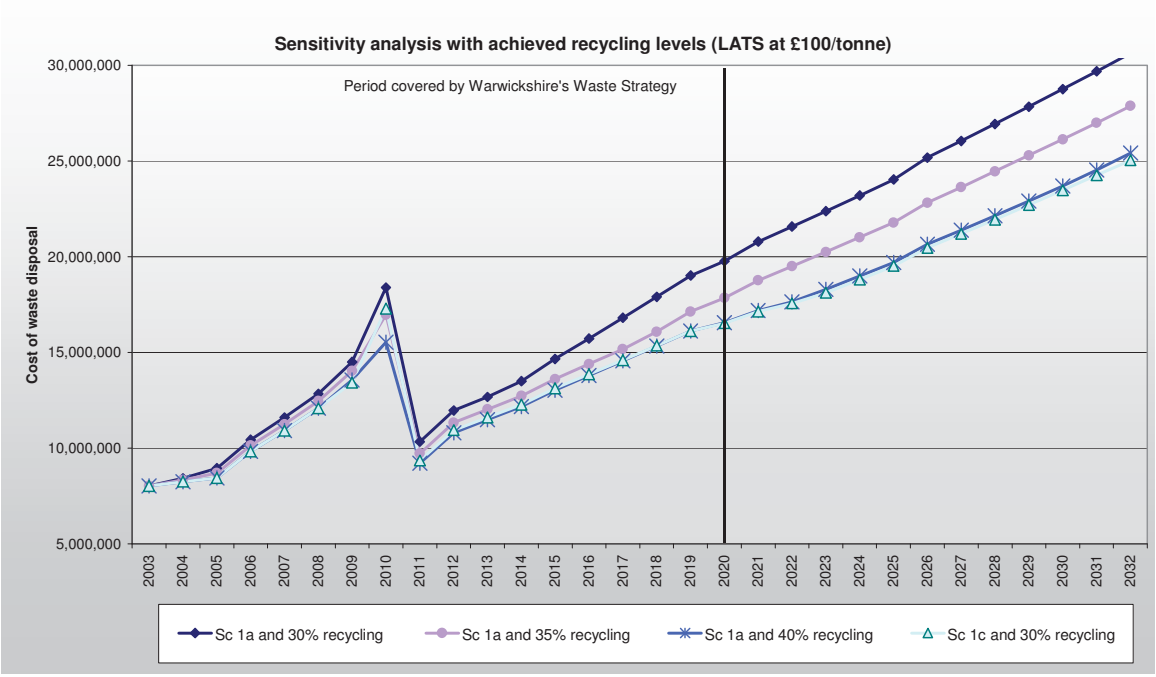

Figure 18: Cost implication if recycling level is not achieved

9.5.4 Public acceptability and planning permissions for facilities

Generally, resistance from the public can be expected to all types of waste treatment facilities although there may be higher resistance to certain types of waste treatment facilities. Gaining planning permission will be difficult, particularly if an EfW facility is proposed in Warwickshire. In addition, as discussed in the previous section this may be more acute if a lower recycling target is achieved. Public opposition may be greater as the facility will be seen to be larger than necessary.

However, if facilities are delayed then there will be significant financial implications for Warwickshire. Thus, there is a need for good promotional information to inform the public on the need for a residual waste treatment facility. There will also be a need for high quality designs that are visually acceptable to the public, and a need for information on the impacts of these facilities.

In order to reduce this risk of planning failure Warwickshire must ensure that any planning application compiles with the Waste Development Framework and planning policy, to prevent any challenges on technical issues. It must also involve the general public in the process by keeping them up to date with the site specific issues as well as informing them about the technologies proposed.

To achieve the stretched recycling targets the full cooperation of the public is required. This will mean some significant changes will have to be made by householders to minimise the amount of waste that they generate, and increase the amount of the remaining waste which is separated out for recycling. If the increase in

recycling rates is not achieved, then the residual treatment facility will need to treat more waste. Therefore there will be a need to use suitable public education programmes which aim to ensure that the required recycling and minimisation rates are achieved.

9.5.5 Risk of failure in the Partnerships arrangements

Warwickshire's authorities developed the Warwickshire Waste Partnership which consists of Officers, Chief Officers and elected Members representing the six Warwickshire authorities. A Memorandum of Understanding will formalise this partnership arrangement.

However, if this relationship cannot be maintained, implementation of the Waste Strategy may be at risk. For example, if one partner authority decides to send biowaste to a facility outside of Warwickshire or does not achieve certain recycling levels, the scaling of the facilities may not be appropriate.

To avoid such a situation, Warwickshire should only enter into partnerships when the partnership has a legal standing.

9.5.6 Failure of Treatment Systems

The BPEO assessment has indicated that waste should be diverted from landfill, and that whilst the use of EfW technology would have the greatest environmental benefits in terms of energy production, there would also be benefits in using MBT technologies (as it means that waste is diverted from landfill) provided that both markets could be identified for the products that they produce, and that potential uses for compost products would not be classified as landfilling.

The main area of concern for deliverability of the waste management strategy will be the management of the residual waste. The key issues are the reliability of the treatment technology and the availability of markets for the products that they generate. Landfilling is a very well established technology which does not produce any products, and therefore it would be the most reliable option although it would not enable the landfill diversion targets to be met. Energy from waste (EfW) technology is also a very well established technology and there is a readily available market for the generated electricity. Mechanical Biological Treatment (MBT) technologies are less well established in the UK although widely used in Europe and as such there are concerns regarding their performance with respect to BMW diversion and product quality.

This risk can be considerably reduced through careful procurement and evaluation of the systems during the tendering process. In addition, any technical risk of operation failure may be passed to the contractor by including a requirement to meet Landfill Directive targets in an output based contract.

9.5.7 Variations in value of tradable landfill allowances

When assessing the different waste management scenarios, assumptions were made regarding the rate at which tradable landfill allowances would be bought and sold. The value of tradable allowances depends on other authorities ability to achieve the targets for diversion of BMW and therefore how the market will develop.

Most local authorities are expected to meet their landfill allowances in the short-term (up to 2009) through increased recycling, borrowing and banking, hence the value is likely to be low due to less demand until 2009. In the medium term (2010-2013) tradable landfill allowances (LATs) may become more valuable as many authorities are likely to have difficulties implementing residual treatment facilities within the required time scale with LATs allocations reducing substantially. Trading and LATs values are likely to reduce in the long-term (2013-2020), because most authorities will plan to meet these targets and will introduce the facilities required in order to reduce the impacts of £150/tonne penalty. However, due to these uncertainties a sensitivity analysis has been undertaken to show the impact of different allowance values on the total costs of waste management (cumulative cost 2007 to 2032). In this analysis, the trade value of landfill allowances were varied between zero up to the maximum of £150/tonne as shown in Figure 19. The same value has been assumed for buying and selling landfill allowances.

Figure 19 indicates that the Base Case A and B become more expensive with increasing LATs values, because all residual waste is landfilled exceeding Warwickshire's allocations. The Base Cases show lower total costs compared to other residual treatment scenarios if landfill allowances can be purchased at low prices up to £20/tonne over the whole contract period. However, it is likely that the landfill allowances will on average be traded above £20/tonne, in particular in the medium term 2010 to 2015. If the residual waste is treated through thermal treatment or MBT, the landfill diversion targets will be met and spare landfill allowances can be sold which would create an additional income for Warwickshire. Consequently, the total cost decreases with the additional allowance income, however, the magnitude depends on the market value of the allowances and how many allowances Warwickshire can provide for sale. In addition, it should be acknowledged that landfill diversion targets are provided until 2020 and it is currently not known how the scheme will continue after that year. In the BPEO assessment we have assumed that the scheme continues but remains static at the same target as in 2020.

In summary, this analysis indicates that treatment of residual waste (any type of thermal treatment or MBT technology) is likely to be more cost effective than landfilling. Having a residual treatment facility in place would reduce the need to purchase landfill allowances, and hence it would reduce the risk to be dependant on the market value of the LATs.

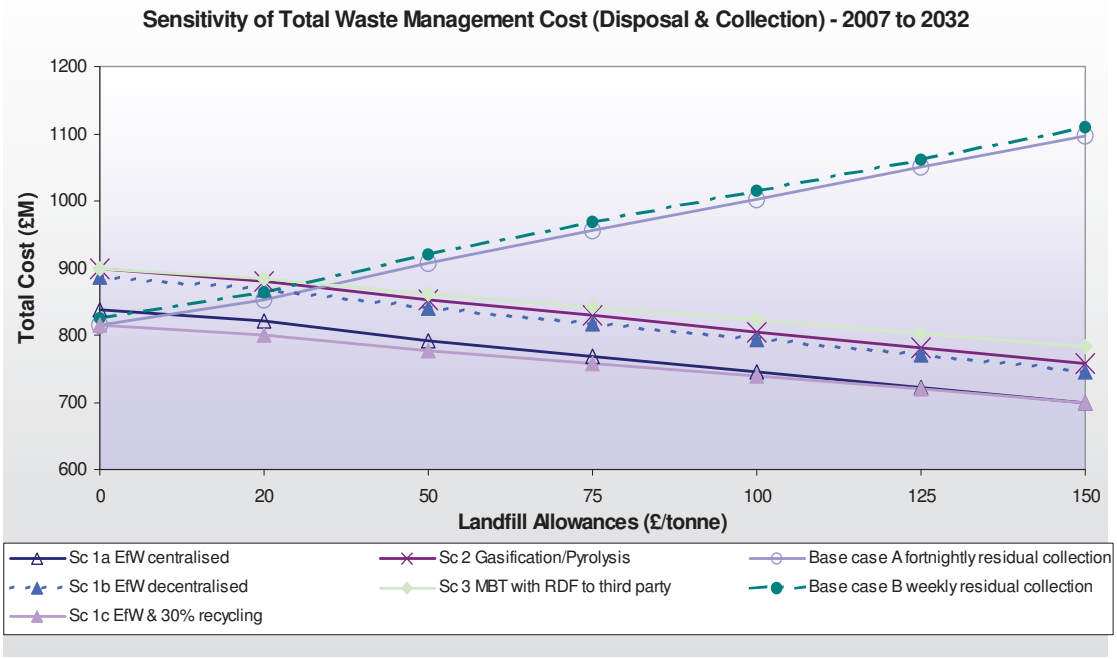

Figure 19: Sensitivity analysis with varying LATS values

9.5.8 Marketing of the products

The targets within this strategy are wholly dependant on the ability to provide products which are acceptable to the market. This aspect is particularly important if an MBT technology is chosen for residual treatment. If the products are not of sufficient quality they will need to be landfilled or disposed of through thermal treatment. This would increase the cost of treating the residual waste due to the need to pay for landfilling of the products. It would also mean that as the MBT plant was not diverting waste away from landfill, Warwickshire would be exceeding its landfill allowance target, and thus would incur additional costs through either purchasing landfill allowances from other authorities, or paying fines to the UK Government. These additional costs would have to be met by increasing the Council Tax.

The other area of concern regarding deliverability of the waste strategy is the availability of markets for materials which are collected for recycling or composting. Although there are potentially significant markets for source separated compost products, they have not yet been fully established. However, nationally compost production will increase in response to the Landfill Directive which will put pressure on the markets for these materials resulting in reduced prices for products.

Markets for dry recyclable materials, such as paper, are well established. However, the markets for recyclable materials are notoriously volatile, although ensuring that the treatment system and resultant products are carefully evaluated during the tendering process can mitigate the risks of being unable to sell material/products.

9.5.9 Other issues

The Warwickshire authorities need to consider the requirement to acquire/identify land that will be necessary for future waste management activities. Additional landfill capacity will be required, and land will be needed for both recycling/composting facilities and for the treatment plant.

We also have to consider the cost to Council Tax payers. The review of costs indicates that any of the options which include treatment of residual waste would be less expensive in the medium to long-term than continuing to landfill waste.

10 KEEPING TRACK OF ACHIEVEMENTS - MONITORING AND REVIEW

In developing the Waste Strategy the Warwickshire authorities have agreed to a number of strategic objectives, which will form the basis of a sustainable approach to waste management in Warwickshire.

Our objectives are specific and have quantifiable outcomes as shown in Table 28, which will allow us to monitor our progress towards sustainable waste management in Warwickshire. It is essential to have specific, measurable targets in order to be able to monitor progress towards meeting our objectives.

Table 28: Key objectives, actions and indicators

OBJECTIVE	TARGETS/ACTIONS	INDICATORS
To reduce the amount of waste generated in Warwickshire	Aim to reduce the quantity of waste collected per head, not exceeding 544kg per inhabitant.	Annual kg of waste produced per person.
	To develop a waste prevention and minimisation strategy	Waste Prevention and minimisation strategy developed by 2006/07.
	To increase reuse of materials in Warwickshire	Number of reuse shops at HWRCs
		Number of furniture reuse schemes in Warwickshire
To develop integrated, sustainable solutions for managing waste in Warwickshire	To reduce reliance on landfill as a primary means of waste disposal.	Reduction in the overall tonnages of waste disposed of to landfill.
		Levels of recycling, composting and recovery.
	Minimise so far as is practicably possible the distance that waste is transported throughout the County.	Monitor distance of journeys.
	Monitor the development of new waste treatment technologies.	Review development and status of new technologies on a regular basis.
	Investigate and implement where practicable the use of cleaner fuels when collecting (including general refuse collection) and transporting waste and for use in vehicles used at HWRC.	Number of vehicles operating on alternative fuel sources.
To meet landfill diversion targets established by the WET Act 2003 (diversion of BMW).	Develop landfill allowance trading Strategy by April 2006.	Strategy will be updated regularly in accordance to changes in the market for Landfill Allowances.
	Development of treatment/disposal procurement Strategy 2005-2012	Development of treatment facilities and subsequent diversion of BMW from landfill (in tonnes).

OBJECTIVE	TARGETS/ACTIONS	INDICATORS
To meet and exceed statutory recycling and composting targets	To optimise recycling and composting within Warwickshire.	Number of households served by separate green waste collection service.
	Aim to achieve enhanced, countywide recycling targets of between 40-45% by 2009/10.	Recycling and composting rate %
	Extend home composting	Number of households estimated to be composting at home.
	Develop improved HWRC infrastructure, increasing the type of materials that can be collected and subsequently recycled. Aim to reach recycling levels of 60% at all sites.	Performance of individual HWRCs (recycling rate%).
	Development of a phased improvement plan for HWRCs over the next 5 years.	Number of sites redeveloped
	HWRC contracts maximise re-use and recycling, aim to recycle 60% at HWRC's	Recycling targets set for individual contractors. Penalty and bonus system in place.
Work in partnership with each other and other stakeholders to produce and implement the Strategy.	Increase the potential for working together more formally.	Development of the Warwickshire Waste Partnership.
		Establishment of formal partnership with Memorandum of understanding.
	Investigate the potential for joint waste contracts.	
	Examine the benefits of working with other authorities outside Warwickshire.	Membership of the Midlands Recycling Consortium.
	Investigating the possible benefits of joint purchasing and negotiating.	Performance of Midlands Recycling Consortium (tonnage recycled through the Consortium)
Encourage public participation in the implementation and review of the Waste Strategy	Keep the public informed with progress on local and national target	Provide web-based feedback – updated regularly to reflect changes in performance.
Regularly review and update the Strategy and implementation programme	Review the Strategy every 3 years.	Feedback on changes and put information on the Web. First review in 2008/09
	Annual reporting on progress with targets and actions	Progress reported on web

We will monitor our performance against our targets annually and will report our progress in the waste strategy section of our website.

10.1 Waste strategy monitoring and review

The Warwickshire Waste Partnership is the body that has driven forward the Strategy process and has decided on the direction that the Strategy should follow. It is important that the Waste Strategy is not a static document and that it should be reviewed and updated on a regular basis to reflect changes in legislation, circumstance and evolving waste treatment technologies. It is for this reason that the Waste Strategy will be fully reviewed every five years with a review of the critical aspects at critical review points.

10.2 Critical review points

At this point in time the critical review points are based around the target years of the landfill directive which are:

- Reduce the amount of biodegradable waste to 75% of 1995 levels by 2010;
- Reduce the amount of biodegradable waste to 50% of 1995 levels by 2013;
- Reduce the amount of biodegradable waste to 35% of 1995 levels by 2020;

The first review of the Strategy is scheduled for 2008/09. This is also a critical review point as infrastructure for processing biowaste should be in place by 2008/09.

APPENDICES

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