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# 1. ASSESSMENT OF OPTIONS FOR WASTE PREVENTION

## *Benefits of waste prevention and re-use*

Numerous benefits may be gained from reducing the amount of waste generated within the community. The Government's aim is "to break the link between economic growth and the amount of waste produced and to drive the management of waste up the waste hierarchy". (see note 1, p28) Waste prevention and re-use sit at the top of the waste hierarchy and guidance provided by Defra advises that as a result of this these options should be considered first in the process of evaluating options for managing waste. (see note 2, p28)

A push towards focusing on the waste hierarchy and thus waste prevention and re-use, is supported by the following benefits, as highlighted by the National Resource and Waste Forum (see note 3, p28) :

- reducing demands on finite natural resources and the often 'hidden' adverse environmental impacts of resource extraction and harvesting;
- reducing the transport impacts that are often significant in overall environmental impact terms (as shown by life cycle assessment methods);
- meeting the demands of EU legislation, particularly the biodegradable municipal waste (BMW) diversion targets of the Landfill Directive translated into the Landfill Allowance Trading Scheme;
- reducing the cost of waste management by reducing the need for waste collection, disposal, treatment and landfill levies; and
- encouraging social inclusion and economic development through creating jobs and training opportunities often for the most disadvantaged in society.

Additional benefits exist that are specific to the waste prevention and re-use options. These are presented in the relevant sections below.

## 2. WASTE PREVENTION INITIATIVES

### 2.1 CURRENT (September 2008) WASTE PREVENTION INITIATIVES WITHIN HEREFORDSHIRE AND WORCESTERSHIRE

A number of waste prevention schemes have been in place in Herefordshire and Worcestershire since June 2000 and have played an important role in reducing the amount of waste sent to landfill. In Herefordshire and Worcestershire a 'Waste Challenge Team' have been employed by both Herefordshire Council (HC) and Worcestershire County Council (WCC) to cover the whole of the two counties for the purposes of promoting and developing waste prevention initiatives; with support from district council officers. Current (September 2008) schemes within the counties are listed in *Table 2.1* below, and discussed in more detail in *Section 3* of this report.

**Table 2.1 Existing (September 2008) Initiatives**

<b>Activity</b>	<b>Coverage / Summary</b>
<b>Commercial Vehicle and Trailer (CVT) Permits</b>	Across the whole of Herefordshire and Worcestershire; very comprehensive coverage.
<b>Residents permits</b>	Introduced in 2 districts only to date.
<b>Home Composting</b>	Project Development Officer (Composting) employed since 2005. Very comprehensive, with good participation across all districts.  40 Master Composters are in place across Herefordshire and Worcestershire to support home composting.
<b>Love Food Hate Waste Campaign</b>	Began promotion in 2007 alongside WRAP's national campaign, promotion to date includes Billboards, adverts in press and roadshows.
<b>Re-use Initiatives</b>	Project Development Officer (Re-Use) employed in 2005. Good working relationship with third / voluntary sector. Social Enterprises involved in Waste and Recycling Forum (SEWAR) facilitated by Re-use Officer. Payment of re-use credits introduced in Worcestershire in 2007.

<b>Activity</b>	<b>Coverage / Summary</b>
<b>Sink Your Waste Project</b>	Project Development Officer (Organics and Home Wood Chipping) employed in 2005. HC and WCC offer a cash-back scheme to residents fitting a kitchen food waste disposer. Reasonable take-up across Herefordshire and Worcestershire
<b>Home Shredding – ‘Shredderman’</b>	Project Development Officer (Organics and Home Wood Chipping) as above. Home wood chipping service run in 3 districts of Worcestershire since 2004. Initially a free service, charges were introduced to customers from January 2007.
<b>‘Jilt the Junk Mail’ campaign</b>	“Jilt the Junk Mail” pack developed detailing how residents can reduce unwanted mail. No comprehensive promotions have taken place other than the launch of the “Jilt the Junk Mail” pack. The pack is promoted alongside other campaigns at public events.
<b>Real Nappy Project and Real Nappy Incentive Scheme</b>	A limited Real Nappy Project has been run across Herefordshire and Worcestershire since 2003/04. In March 2007 the Real Nappy Incentive Scheme was launched across Herefordshire and Worcestershire. The Incentive Scheme is administered by Green Nappies, a social enterprise working with adults with learning difficulties. 10 ‘Nappaccino’ events are run each month across Herefordshire and Worcestershire.
<b>Waste collection policies e.g. side waste restrictions</b>	Some Waste Collection Authorities (WCAs) have policies restricting or forbidding side waste, in order to limit the amount of waste collected from residents and to encourage waste reduction, re-use and recycling.

### **3. Waste Prevention Options Appraisal**

This section details the options appraisal. The appraisal has been conducted to help the authorities establish where resources can best be allocated to ensure the maximum reduction of waste materials entering the Municipal Solid Waste (MSW) stream.

#### **3.1 METHODOLOGY**

An introduction to each initiative option is provided, including a list of risks and benefits. Prevention options are explored, including current (September 2008) approaches being undertaken in the area and further development of the initiatives. Finally a cost/benefit summary involving the determination of whether Herefordshire and Worcestershire will achieve a net benefit through development and implementation of waste prevention programmes is provided.

The aim of this section of the report is to guide the authorities in their future plans when allocating funds to schemes and resources. It intends to present the authorities with examples of ways to push waste prevention schemes to the maximum and is by no means intended to be prescriptive. The options provided show the potential tonnage diversion that could occur if, for example participation rates in home composting were increased or if 'smart shopping' behaviours were adopted by householders, and intends to be an indicative selection of options that will help to guide the authorities when making future plans.

The options provided also show the potential tonnage diversion that could occur if, for example participation rates are increased or coverage of the initiative or scheme is expanded.

Discussions were held with waste prevention officers and waste management staff in order to obtain detailed information relating to current (September 2008) and potential waste prevention schemes, and to agree assumptions regarding potential waste diversion and cost benefit estimates.

The options discussed above have been assessed against a variety of criteria. Consideration was given to the:

- percentage of the waste stream that the waste type constituted;
- potential reduction / diversion (percentage) of the waste stream;
- target levels for the population;
- arisings (tonnage) of MSW diverted from landfill;
- savings in disposal and collection costs;
- costs of initial infrastructure and ongoing programme costs; and
- financial benefit of implementing the prevention or re-use initiative.

A number of assumptions have been made in order to carry out the waste prevention options appraisal which are highlighted in the appraisal for each option. All costs have been based on present (September 2008) costs, with no uplift for inflation, or for example the increasing cost of disposal to landfill and landfill tax. Cost information is provided for comparison purposes only and is not an accurate reflection of 'real' cost or benefit to the authorities, resulting from the implementation of the waste prevention options.

### ***Commercial Vehicle and Trailer (CVT) Permit Scheme***

In 2007 a comprehensive CVT scheme was implemented throughout all Household Waste Recycling Centres in Herefordshire and Worcestershire, to actively discourage illegal trade waste deposits into the Municipal Waste Stream. The scheme allows residents to apply for a permit (at no charge) which enables them to use small vans, trailers and lorries to deposit household waste. Site staff have the power to stop vehicles and refuse entry if they suspect that the contents are not household waste.

This scheme is considered to be very successful and the potential for further impact on waste prevention may be minimal. Therefore, this scheme has not been included in the assessment of potential prevention measures and initiatives within this report.

#### ***3.1.1 Home Composting Program***

Home composting prevents garden and vegetable waste from entering the waste stream, and, as such, is an important contributor to targets for the diversion of biodegradable municipal waste (BMW) from landfill and helping to achieve the Landfill Allowance Trading Scheme (LATS) obligations. Home composting does not as yet contribute to meeting LATS obligations, although may well do so in the future. *Table 3.1* highlights benefits and risks associated with initiating further home composting programmes.

**Table 3.1 Home Composting: Benefits and Risks**

<ul style="list-style-type: none"> <li>• Reduced need to buy peat-based composts.</li> <li>• Further public engagement/awareness.</li> <li>• Reduced costs for collection and disposal.</li> <li>• Avoidance of LATS penalties.</li> <li>• Reducing resource/energy use.</li> <li>• Reduced volumes of BMW to be sent to landfill, therefore reduced landfill costs.</li> <li>• Reducing weight of residual waste.</li> <li>• Reduced pollution due to fewer car journeys to HWRCs, landfill sites and composting facilities, and reduced collection vehicles on the roads.</li> <li>• Social inclusion through community composting projects.</li> <li>• Convenience</li> </ul>	<ul style="list-style-type: none"> <li>• Quantities of waste diverted may not reach expected levels due to low demand /participation rate resulting from lack of knowledge, cost of bins and lack of space.</li> <li>• Image- it is not perceived to be relevant or attractive to some groups.</li> <li>• Composting is considered by some to be smelly and unpleasant.</li> <li>• Potential for pests, such as rats, to make their homes in compost bins.</li> <li>• Householder cannot always afford to buy compost bins (the WRAP national home composting programme will not continue to subsidise bins).</li> </ul> <p>Residents can lose interest after bins become full and need emptying.</p>
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In order for home composting schemes to be successful, the householder needs to play an important role in the uptake of the scheme. The individual authorities are responsible for awareness raising, making the scheme more accessible and for assisting residents where necessary, but a significant change in behaviour from residents is necessary for participation to increase.

The individual authorities have adopted the promotion of home composting initiatives as a means of reducing the amount of household waste collected and disposed of in Herefordshire and Worcestershire. Comprehensive campaigns have been running since approximately 2004 to promote home composting across the two counties. A Project Development Officer (Composting) was put in post by HC and WCC in 2005 to further the Home Composting Programme across the two counties.

HC and WCC have been partners in the Waste and Resources Action Programme (WRAP) Home Composting Programme since April 2004. From April 2004 – end July 2008 over 79,000 compost bins were sold via this scheme.

HC and WCC also have a Master Composter Scheme in place, whereby a number of volunteers actively encourage and support residents to compost at home. This scheme has been in place since April 2006.

Road shows and Compost Clinics are run periodically to support existing composters.

There are further opportunities for the authorities in Herefordshire and Worcestershire to increase the level of home composting by ensuring householders continue to use their existing bins and promoting home composting to new users.

Due to the high number of established home composters and the number of bins already sold to residents in the two counties, it is likely to become increasingly difficult to convert remaining householders to home composting. That said, a significant proportion of remaining MSW is biodegradable and can be composted at home. A focused approach to identify those households who have gardens but who are not already composting should be considered.

A support package for composters will help to deliver maximum diversion rates throughout the life of the compost bins sold to date, and bins provided in the future. There is scope to provide further support by expanding the Master Composter Scheme.

There may also be an opportunity to reduce the amount of biodegradable waste sent to landfill and reduce the amount of green waste entering HWRCs by encouraging community groups to start up community composting sites.

*Table 3.2* summarises an assessment of the potential for diversion of garden and kitchen waste from households with gardens. (see note 4, p28) If 65% of households with gardens throughout Herefordshire and Worcestershire participate in home composting by 2020/21, it has been estimated that up to 4.37% of total MSW arisings can be prevented. This however will require a significant increase in participation through education and incentive campaigns. In theory, over 60% of household waste (by weight) is biodegradable and therefore can be composted. (see note 5, p28) However, in practice, 30% of household waste can be composted easily at home, or in the community (see note 6, p28) (equating to approximately 360kg per household).

**Table 3.2 Targets for home composting**

<b>Year</b>	<b>Max Target No. of households with Gardens</b>	<b>No. of bins distributed (cumulative)</b>	<b>No. of additional bins required**</b>	<b>Target % of households with space home composting</b>	<b>Number of households based on Target %</b>	<b>Potential for diversion tonnes / yr (at 140Kg / hhold) at 70% participation)</b>
2007/08	-	76,485	-	-	*108,860	-
2010/11	277,100	120,982	44,497	45%	124,695	12,220
2013/14	285,000	167,843	46,861	50%	142,500	13,965
2020/21	303,450	278,031	110,188	65%	197,243	19,330

### *Assumptions*

Diversion tonnages are based on data taken from the Household waste Prevention Toolkit relating to individual authorities that suggest home composting quantities typically range from 100 – 200 kg per household per year (see note 7, p28). Recent communication with WRAP who are currently (September 2008) undertaking a review of the toolkit has resulted in a suggested figure of 140kg per household. We have assumed that the percentage of households with gardens (including detached, semi-detached, bungalow and terrace) is 85% (this figure has been supported by WRAP and compares well to census data for 2001, suggesting that 87.5% of households in Herefordshire and Worcestershire had gardens).

\* The base figure of 108,860 households' home composting in 2007/8 is calculated using data supplied by WRAP relating specifically to Herefordshire and Worcestershire. This assumes that 29% of households in Herefordshire and Worcestershire were actively home composting before bins were available from WRAP and Herefordshire / Worcestershire partnership, and that 67,500 households received compost bins from the WRAP and Herefordshire / Worcestershire partnership (up to 2007/8). Of those households receiving bins from the partnership up to 2007/08; 50% were already home composting. (see note 8, p28)

\*\* The number of additional bins requiring distribution, and to have been put into use by each of the target years in *Table 3.2* has been calculated by assuming that each additional household which adopts home composting will require 1.2 compost bins ( 1.2 is the average number of compost bins per household adopting home composting; this figure was provided by WRAP), and that all home composting bins purchased up to 2010/11 will be replaced by 2020/21 (this is based on the assumption that a compost bin has a 10 year useful life).

### *Cost and Benefit*

Costs involved in this programme include the infrastructure such as composting bins, promotional and advertising costs and the support staff to manage the programme and volunteer support. the overall cost impacts can be seen in *Table 3.1*. local authority can expect cost savings of £10.20 per tonne based on avoided costs of collection and disposal, and factoring in the compost bins, promotion and support work. (see note 9, p28)

We have estimated based on today's figures, an annual benefit, taking account of initiative costs and avoided disposal (see note 10, p28) of £1,044,495 in 2020/21.

### 3.1.2 Real Nappy Project

Using reusable nappies instead of disposables can contribute to the diversion of waste from landfill. In order for reusable nappy initiatives to be successful there needs to be a change in behaviour and attitudes towards the use of these nappies from householders. Authorities need to increase awareness of available schemes (e.g. laundry services) and some subsidise or incentivise schemes to encourage their uptake; however, these schemes do rely on behavioural changes from householders in order to be effective. *Table 3.3* highlights benefits and risks associated with expanding reusable nappy diversion schemes.

**Table 3.3 Real Nappy project: Benefits and Risks**

Benefits	Risks
<ul style="list-style-type: none"><li>• Greater participation in schemes will ensure ongoing availability.</li><li>• Reducing resource/energy use</li><li>• Once purchased, real nappies can be kept and used for subsequent children.</li><li>• A baby typically gets through 5,000 to 6,000 nappies, weighing around 1 tonne. In comparison, a baby only needs around 20 to 30 modern washable nappies. (see note 11, p28)</li><li>• Using real nappies can save parents money.</li></ul>	<ul style="list-style-type: none"><li>• An initial investment in the nappies is required which can be an economic barrier to some families.</li><li>• Participation may be dependant on environmental debates regarding the costs and benefits of real nappies.</li></ul>

Herefordshire and Worcestershire currently (September 2008) have a Real Nappy Project which operates across the two counties. This includes a Real Nappy Incentive Scheme which gives parents the opportunity to either receive £30 cash-back when they purchase £50 worth or more of real nappies (excluding accessories) or claim a free pack of 'prefold' nappies worth approximately £15 from 'Green Nappies', a social enterprise working with adults from disadvantaged groups. The scheme is administered by Green Nappies. A network of volunteers has also been mobilised as part of this scheme who run 'Nappaccino mornings' (informal networking events) and give first hand advice to parents who are looking to use real nappies, or who are struggling with real nappies.

Table 3.4 summarises an assessment for the diversion of disposable nappies from the household waste stream. If 35% of parents with babies use 'real' reusable nappies by 2020/21, up to 0.67% of total MSW arisings can be reduced.

**Table 3.4 Targets for the promotion of real nappies**

Year	Estimated No. of babies in the sub-region	Target % babies in reusables	Target No. of babies in reusables	Potential for diversion (tonnes)
2007/8		4% (see note12, p28)	954	334
2010/11	23849	15%	3614	1,265
2013/14	24339	25%	6085	2,130
2020/21	24905	35%	8717	3,051

#### *Assumptions*

The number of babies in Herefordshire and Worcestershire has been calculated by determining the percentage of the population in the 0-4 age category (which is 5.2% of the population across Herefordshire and Worcestershire) and multiplying this by 0.625 (1/4 \* 2.5) to ascertain the proportion of the population between the ages of 0 and 2.5. This figure was used instead of the number of babies born in Herefordshire and Worcestershire, as babies not born within the two counties would not be included in such calculations if they moved into the area. Likewise, this portion of the population may change if babies move out of the area.

Recent studies have estimated that babies generally wear nappies for 2.5 years. During this time, a baby will use approximately 3796 nappies (4 per day). (see note 13, p28) This equates to a range of approximately 205kgs – 350kgs per child per year over the 2.5 years of estimated use. (see note 14, p29) Based on these estimates, potential reductions have been calculated, as shown in *Table 3.4*.

#### *Cost and benefit*

The costs involved for this programme require a small contribution to the salary of a Local Authority coordinator and the costs required to support an incentive scheme (including campaign materials and expenses) focused on waste prevention and re-use. The current (September 2008) scheme is also reliant on the goodwill of a number of volunteers who run the Nappaccino mornings and give first hand advice to parents who are looking to use real nappies, or who are struggling with real nappies. This time is invaluable but it is difficult to quantify. The overall impacts can be seen in *Table 3.17*.

### 3.1.3 Sink Your Waste

Herefordshire Council and Worcestershire County Council began promoting the use of kitchen food waste disposers in 2005 by offering a cash-back incentive for residents who fitted a food waste disposer. Kitchen food waste disposers provide a means by which residents can dispose of waste food without it entering the household waste stream. Disposers are particularly useful for residents who cannot compost at home and for disposing of inedible food and cooked food leftovers which should not be composted e.g. meat and fish bones.

It is understood that there are no other local authorities promoting and supporting the cost of food waste disposal units to the householder as a means of diverting biodegradable food waste from the MSW stream. It is commonly thought that sewage undertakers / water companies do not approve of disposal in this way, and to this end the two authorities are stakeholders in a three year collaborative research programme with the Water Research Centre (WRc). Whilst internationally the results of studies into food waste disposers are broadly favourable, there is a growing consensus that if biogas is effectively utilised from the anaerobic digestion of sewage sludge to generate heat and power, the addition of food waste will not compromise the operation of sewerage systems or waste water treatment facilities.

**Table 3.5 Sink Your Waste: Benefits and Risks**

<ul style="list-style-type: none"> <li>• Further public engagement/awareness of the need to take responsibility for your own waste.</li> <li>• Reduced costs for collection and disposal.</li> <li>• Provides residents with a choice of disposal options for their food waste.</li> <li>• Compliments home composting by providing a method of disposal for getting rid of un-compostable items e.g. meat/ fish bones.</li> <li>• Supports alternate weekly residual collections for those that do not want food waste in their bin for up to two weeks.</li> <li>• Avoidance of LATS penalties.</li> <li>• Reduced volumes of BMW to be sent to landfill, therefore reduced landfill costs.</li> <li>• Reducing resource/energy use.</li> <li>• Reduction in residual waste per household help meet NI191.</li> </ul>	<ul style="list-style-type: none"> <li>• Quantities of waste diverted may not reach expected levels due to low participation rate resulting from lack of knowledge or residents being unable to afford to fit kitchen food waste disposers.</li> <li>• Risk of water companies disapproving of the project due to increased load, operating costs, Animal Bi-products Regulations, Increase in BOD (Biological Oxygen Demand), rodents, blockages causing foul flooding and increased water usage. Household maintenance and replacement costs may be prohibitive for some.</li> </ul>
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The Sink Your Waste scheme offers residents of Herefordshire and Worcestershire a rebate of £20 - £80 against the purchase and fitting of a food waste disposal unit. Informal partnerships have been developed with manufacturers and distributors of disposal units to promote this initiative. The total number of 'cash back' rebates and corresponding units installed up to the end of 2007/8 was 1469. This represents approximately 0.5% of total households in the two authority areas.

Road shows are periodically held in shopping centres, market towns and supermarkets and at public events to demonstrate the use of disposal units to the householders.

Table 3.6 summarises an assessment of the potential for diversion of food waste from the household waste stream. If the number of units installed increased to 5% of total households by 2020/21, this scheme would divert an estimated 0.73% of MSW.

**Table 3.6 Targets for the Sink Your Waste Food waste disposal unit initiative**

Year	Target No. Households (cumulative)	Target % Households (of total in the sub-region)	Potential for diversion (tonnes / yr)
2007/8	1469	< 0.5%	264
2010/11	3260	1%	587
2013/14	10050	3%	1,809
2020/21	17850	5%	3,213

#### *Assumptions*

It has been assumed that each disposal unit on average diverts 1.44 tonnes of waste from the MSW stream over its 8 year life; corresponding to approximately 180 kgs per unit each year. (see note 15, p29) The potential diversion as shown in table 2.7 has been estimated on this basis.

#### *Cost and benefit*

The cost to the two authorities per unit, including staff costs and promotional activities has been an average of approximately £145 (up to 2007/8). It is understood that the budget for promotional activities has been reduced, however this average cost up to 2007/8 has been used to approximate ongoing costs. The overall net benefit of this initiative can be seen in Table 3.17.

### 3.1.4 Home Shredding : Shredderman

WCC has been operating the 'Shredderman' service for a number of years. The main objective of this service is to encourage residents to retain their garden waste at home and use it as a resource. A Shredder vehicle and operative visits homes to shred large woody garden waste for use in the householders own grounds. Residents may otherwise have taken this waste to Household Waste Recycling Centres (HWRCs) for composting. This scheme aims to divert garden waste from HWRCs and thus avoid associated treatment and disposal costs.

**Table 3.7 Home Shredding - Benefits and Risks**

- Reduces tonnage of green waste entering Household Waste Recycling Centres.
- Converts garden waste into a valuable resource and encourages residents to use this at home.
- Demonstrates the proximity principle of dealing with waste as near as possible to point of origin.
- Compliments home composting by providing an option for being able to compost larger woody items at home.
- Provides an alternative to separately collected green garden waste.
- Further public engagement/awareness of the need to take responsibility for your own waste.
- Reduced costs for collection and disposal.
- Reduced numbers of vehicles on roads as residents no longer need to visit Household Waste Recycling Centres to deal with green garden waste.
- Shredderman contributes towards the national waste strategy target of reducing household waste to 450kg per person pa in 2020.
- Quantities of waste diverted may not reach expected levels if the service is not fully booked.
- Mechanical failure / breakdown which leads to curtailment of the service.
- Income generated may have peaked leading to unsuitability of future price increases to the customer.
- Service is currently (September 2008) dependant on co-operation of Redditch Borough Council landscaping and cleansing department.
- Residents may still take shredded by material to a HWRC, resulting in the authority paying twice for treatment and disposal.

Shredderman was initially a free service for residents; however since 2007 a charge has been introduced. To date (September 2008) this service has been run as a trial only in the Wychavon, Worcester City and Redditch districts. This service has not been extended into Herefordshire due to the rural nature of the county and the large distance between homes, which would increase travel times and costs for the operation of the service.

Additional promotion of 'home shredding' by residents has been conducted, to encourage residents to purchase a garden shredder and shred woody garden waste at home. Promotions have been on a relatively small scale.

*Table 3.8* summarises an assessment of the potential for diversion of garden waste from the household waste stream as a result of an expansion of the Shredderman service. If the number of customer visits was increased to 2700 per year in 2020/21 (roughly doubling the impact of the current (September 2008) service) this scheme would divert an estimated 0.2% of MSW.

**Table 3.8 Targets for home shredding: Shredderman**

Year	Target No. customer visits	Customer growth (from 2007/8 base visits)	Potential for diversion (tonnes / yr)
2007/8	1350	-	462
2010/11	1688	25%	577
2013/14	2025	50%	693
2020/21	2700	100%	923

#### *Assumptions*

It has been assumed, that based on the operation of the current (September 2008) service, a maximum of 1350 customer visits is possible each year, and on average 342kgs of waste are diverted for each customer visit (this is based on the annual tonnage diverted in 2007/8, divided by the number of customer visits).

#### *Cost and Benefit*

Costs have been based on the actual running cost (which includes staff time and associated promotional costs) for 2007/8 and the income from customer charges. When the potential avoided cost of disposal is considered (see note 16, p29) the net cost of this service operating in 2020/21 is estimated at £9,589.

### **3.1.5 Junk Mail Prevention: Jilt the junk mail campaign**

Unwanted mail, including advertising materials and free newspapers, accounts for around 3% of household waste. (see note 17, p29) Preventing unwanted mail relies on householders refusing handouts/free papers and by committing to the mailing preference service to limit postal promotions. In order for householders to be aware of these schemes, authorities need to raise awareness and provide relevant information. Benefits and risks associated with initiating a Mailing Preference Service promotional campaign across the sub-region are summarised in *Table 3.9* below.

**Table 3.9 Junk Mail Prevention - Benefits and Risks**

<b>Benefits</b>	<b>Risks</b>
<ul style="list-style-type: none"> <li>• Once a household has committed to the Mailing Preference Service, reductions will be observed after 3-4 months.</li> <li>• Where commingled recycling services are offered, the reduction of this waste stream will allow more capacity within kerbside boxes / wheeled bins.</li> <li>• Reducing resource/energy use.</li> <li>• Could potentially divert BMW away from landfill.</li> </ul>	<ul style="list-style-type: none"> <li>• To achieve maximum reduction, householders will need also to commit to reducing unwanted mail by refusing handouts, flyers and free newspapers and magazines.</li> <li>• Reduce quantity of material for recycling.</li> </ul>

The “Jilt the Junk Mail” campaign has been promoted throughout Herefordshire and Worcestershire; however opportunities do exist to extend promotional activity further. A “Jilt the Junk Mail” pack has already been produced and could be used more extensively and built upon in future.

Table 3.10 summarises an assessment of the potential for prevention of unwanted mail from household waste. If 50% of households actively participated in a prevention programme by 2020/21 up to 1.26% of the total MSW stream could be prevented.

**Table 3.10 Targets for reducing Junk Mail within the MSW Stream**

<b>Year</b>	<b>Participating Households</b>	<b>Potential diversion (tonnes / yr)</b>
2007/8	5%	487
2010/11	20%	2,034
2013/14	25%	2,613
2020/21	50%	5,569

*Assumptions*

The quantity of unwanted mail generated within households was estimated at 3% (or 0.6kgs per household per week). (see note 18, p29)

### Cost and benefit

There is limited data available to support estimated costs for such a promotional scheme; however costs should include contribution to the salary of Local Authority staff and the association promotional and campaign materials. For this exercise we have assumed a promotions and campaign cost of £2 per household (inclusive of all associated costs) to be split equally between Junk Mail, Smart Shopping and Food Waste prevention initiatives. Taking account of this cost and the potential avoided cost of disposal, the net benefit of this initiative in 2020/21 is estimated to be £183,559. The overall net benefit of this initiative can be seen in *Table 3.17*.

#### 3.1.6 Smart Shopping

Householders can influence waste arisings through informed purchasing to reduce waste entering the home and then the municipal waste stream. Waste can also be reduced through buying more durable goods, or reusing and repairing products in the home. This includes for example householders taking their own plastic bags or reusable bags to supermarkets, choosing products that use less packaging, buying products made of recyclable materials and buying refills (generally available for products such as fabric conditioner and washing powders). Local authorities, such as Surrey County Council and the London Borough of Richmond have implemented smart/sustainable shopping programmes or Shop SMART (Save Money and Reduce Trash). HC and WCC have touched upon the principle of Shop Smart through the Mission Impossible action pack but there is potential to run more comprehensive campaigns in future. Consumer purchasing decisions can impact upon more than 60% of waste generated from purchased goods. (see note 19, p29)

Benefits and risks associated with initiating a shop smart re-use campaign across Herefordshire and Worcestershire are summarized in *Table 3.11*.

**Table 3.11 Smart Shopping - Benefits and Risks**

Benefits	Risks
<ul style="list-style-type: none"><li>• Campaign may have wider benefits in raising environmental awareness</li><li>• Reducing resource / energy use</li></ul>	<ul style="list-style-type: none"><li>• Difficult to achieve major reductions in waste without industry cooperation and government intervention such as a plastic bag tax, indirect / direct charging for waste collection and disposal.</li></ul>

Targeting various stakeholders will be essential to ensure the success of a smart shopping programme. Encouraging industry to further reduce retail packaging materials will also assist.

Incentivising prevention programmes may assist with reducing waste within the community. Ultimately, educating the community to consider the impact of their choices on the environment is likely to lead to long-term behaviour change and thus greater success regarding waste prevention.

It is important to stress that behavioural changes are essential for smart shopping programmes to be successful. Householders, supermarkets, authorities and packaging manufacturers/suppliers all need to be involved in changing current practices in order for packaging to be reduced and for more informed purchasing to be undertaken. Raising awareness through advertising is an important way to change current shopping habits.

Currently (September 2008), there are no waste aware (smart) shopping schemes in Herefordshire and Worcestershire, therefore, the potential impact of introducing a scheme if successful is likely to be great. *Table 3.12* summarises an assessment of the potential for diversion of shopping/packaging waste within the two counties. Packaging/shopping waste makes up 60% of the total waste arising in the household waste stream. If 35% of households reduce their shopping/packaging waste by just 10% by 2020/21, over 10,500 tonnes of waste could be diverted (this represents 2.38% of total MSW arisings).

**Table 3.12 Targets for reduction of shopping waste within the MSW stream**

Year	Estimated achievable reduction of household waste	Households participating in behaviour change	Potential exclusion (tonnes / yr)
2007/8	10%	5%	1,357
2010/11	10%	10%	2,788
2013/14	10%	20%	9,960
2020/21	10%	35%	10,516

#### *Assumptions*

This analysis is based on studies (see note 20, p29) that have calculated that:

- shopping waste constitutes 60% of the household waste stream; and
- a 10% reduction of waste in each household can be observed.

#### *Cost and Benefit*

There is limited data available to support estimated costs for such a promotional scheme. The costs involved for this programme require contribution to the salary of a number of Local Authority coordinators in addition to campaign materials, promotional costs and expenses focused on smart shopping.

For this exercise we have assumed a promotions and campaign cost of £2 per household (inclusive of all associated costs) to be split equally between Junk Mail, Smart Shopping and Food Waste prevention initiatives. Taking account of this cost and the potential avoided cost of disposal, the net benefit of this initiative in 2020/21 is estimated to be £555,919. The overall net benefit of this initiative can be seen in *Table 3.17*.

### 3.1.7 Re-use initiatives

Re-use involves passing on used goods (with or without sorting / refurbishment) to those who can make further use of them. Re-use presents Herefordshire and Worcestershire with a low cost opportunity to increase tonnages diverted from the waste stream.

One study has found that 77% of upholstered furniture and 60% of domestic appliances disposed at HWRC sites could theoretically be refurbished and re-used. (see note 21, p29) Furthermore, HWRC sites committed to re-use have been found to generally have higher recycling rates, as a result of increased public awareness and improved staff motivation. (see note 22, p29) Other schemes such as Freecycle, a web-based free trading system, have proven successful at allowing the community to benefit from re-use opportunities. To maximise the re-use potential of the waste stream, a forum has been established across the two counties; the Social Enterprises involved in Waste and Recycling Forum (SEWAR) was formed in 2005. A Re-use Officer is in post to support awareness raising of the Re-use organizations operating in the two counties and to increase participation. *Table 3.13* highlights benefits and risks associated with initiating re-use campaigns across the area.

**Table.3.13 Re-use Schemes - Benefits and Risks**

Benefits	Risks
<ul style="list-style-type: none"> <li>• Creation of jobs and training opportunities particularly for disadvantaged groups.</li> <li>• Provision of low-cost goods for low income families, schools and charities.</li> <li>• Help to meet requirements of the WEEE Directive.</li> <li>• Second-hand and charity stores can distribute reusable materials and raise money.</li> <li>• Reducing resource/energy use.</li> <li>• Hazardous waste reduction such as electrical equipment and paint.</li> <li>• Diverts waste from landfill.</li> </ul>	<ul style="list-style-type: none"> <li>• Poor public image/pre-conceived negative images of used goods can become a barrier to establishing a successful scheme.</li> <li>• Concerns include security (eg computers), liability (H &amp; S), and selling items and keeping money on-site (HWRCs).</li> <li>• Goods donated to charitable organizations which are not accepted or cannot be sold may be returned to HWRC sites.</li> </ul>

Re-use in the community and the home offers the potential to reduce arisings of many items of waste including packaging, electrical equipment, furniture, wood, textiles, books, CDs, bicycles, tools, and paint. A number of re-use charities and organisations have been working in Herefordshire and Worcestershire for many years. These are well-established and known to residents for donations of second-hand furniture and domestic appliances, and some offer a free collection service from peoples' homes. The effect may be relatively localised in a neighbourhood or, in the case of some larger organizations, initiatives have an impact throughout Herefordshire and Worcestershire.

**Table 3.14 Re-use initiatives in Herefordshire and Worcestershire**

<b>Re-use scheme</b>	<b>Details</b>
Project Development Officer (Re-use)	A full time member of staff was put in place to manage the Re-use Project across Herefordshire and Worcestershire in 2005.
Social Enterprises involved in Waste and Recycling Forum (SEWAR)	WCC facilitates the forum, which has met regularly since July 2005. This has improved relationships between the LA and the third sector.
Re-use credits	The forum has seen the introduction of re-use credits in Worcestershire, a fair system of financial rewarding and incentivising the diversion of waste from landfill. Payment of re-use credits in Herefordshire is beginning to be implemented.
Community Grants for Re-use and Recycling	A community grant scheme to support organisations involved in re-use activities was introduced in April 2007. This is planned to be an annual activity.
Re-use Guide	A local directory of re-use organisations has been produced to signpost public donations.
Furniture and electrical appliances	HC and WCC work well with several well-established furniture and electrical appliance re-use organisations. Furniture and electrical appliances are donated to them by members of the public, some offer collection services.
Business waste – Scrapstore	The main focus has been on household waste, however, the authorities work with a local “scrapstore” who take in business waste and then offer it to the community as art resources
Freecycle	The Officer responsible for Re-use has worked with Freecycle moderators to further awareness of the movement and maximise usage
Swap Shops	The Project Development Officer (Re-use) introduced Swap Shops in 2008 and is assisting community groups in running their own events

<b>Re-use scheme</b>	<b>Details</b>
Bicycle Re-use	WCC works closely with a number of social enterprises involved in bicycle re-use, who engage with disaffected teenagers and adults with disabilities
Computer Re-use	Work with local charities who re-use and recycle computers and help to provide employment for adults with learning difficulties
Re-use at Household Waste Recycling Centres	This is fairly limited at this stage however possibilities are being explored for introducing re-use at sites in the two counties
Charity Shops	HC and WCC encourage members of the public to donate to/ buy from charity shops

Residents are currently able to contact the Waste Collection Authorities for a bulky waste collection of larger items (in most districts of Worcestershire this is a charged service; excluding Wychavon). The majority of waste collected is sent to landfill with the exception of white goods which are subject to the requirements of WEEE legislation. Herefordshire have an agreement with a re-use organization who handle their bulky waste collections and select items for re-use. There is scope for a similar scheme in Worcestershire.

The new National Indicator (NI 192) includes re-use as a measurable outcome which gives more incentive to support re-use, particularly exploring opportunities to develop re-use at Household Waste Recycling Centres, alongside recycling.

Efforts can be increased amongst the authorities to re-use goods that would otherwise become waste. *Table 2.16* summarises the potential for diversion of re-usable items from the MSW stream. If 25% of households re-used goods by 2020/21, up to 1.25% of total MSW arisings could be diverted.

**Table 3.15 Targets for re-use of waste**

<b>Year</b>	<b>Target proportion of households participating</b>	<b>Target diversion assuming 2% reusable (tonnes / yr)</b>	<b>Target diversion assuming 5% reusable (tonnes / yr)</b>
2007/8	+5%	-	1,327
2010/11	10%	817	2,042
2013/14	15%	1,255	3,139
2020/21	25%	2,209	5,523

### *Assumptions*

In general, estimates lie between 2% and 5% (see note 23, p29) of total MSW material arising that can be re-used. These figures have been used to calculate the lower and upper bounds of what might be achieved through further focus on re-use. Further in-depth waste composition analysis particularly of bulky waste streams will allow the potential for diversion and prevention through re-use to be better understood.

### *Cost and Benefit*

The costs involved in a re-use programme include establishing re-use facilities (e.g. as part of a HWRC site), staff costs, payment of re-use credits and promotion costs. Costs for running and supporting re-use initiatives in Herefordshire and Worcestershire have been based on the actual costs in 2007/08 which equate to approximately £77 per tonne. When the potential avoided cost of disposal is considered (see note 24, p29) the net cost of this service operating in 2020/21 is estimated at £9,555. The overall benefits of re-use initiatives can be seen in *Table 3.17*.

### **3.1.8 Food Waste Prevention : Love Food Hate Waste Campaign**

The waste compositional analysis carried out across Herefordshire and Worcestershire in 2007/08 by Resource Futures highlights that approximately 25% waste entering the household collected waste stream is food waste. Some food waste is inevitable, for example, meat bones and vegetable peelings. However, currently a lot of the food which gets thrown away is perfectly edible.

Herefordshire Council and Worcestershire County Council are running projects to help reduce the amount of inedible food waste entering the waste stream by implementing home composting and food waste disposer initiatives.

Households can reduce the amount of food waste that they produce through making better informed purchases and by knowing how to store and prepare food to gain the maximum potential from the food they buy whilst producing minimum waste.

Herefordshire Council and Worcestershire County Council have already begun encouraging residents to consider and act on the amount of food that they waste by supporting the WRAP, Love Food Hate Waste initiative. However, this is only a start and far more work needs to be done to reduce the amount of food waste, one of the single biggest elements contributing to the household waste stream.

WRAP studies, issued in 2007, found that UK households create 6.7 million tonnes of food waste each year, accounting for some 19% of municipal waste. Research suggests that most of this could have been eaten if it had been managed better (stored correctly, used in time and cooked in the correct quantities). (see note 25, p29)

The potential for further food waste reduction is likely to be impacted by a growth in home composting, smart shopping behaviours and the use of food waste disposers already discussed in this report. It is therefore difficult to accurately determine the impact of a campaign alone on extra diversion.

*Table 3.16* summarises an assessment of the potential for further diversion of food waste through a targeted and sustained promotion and education campaign.

**Table 3.16 Targets for Food Waste Prevention**

Year	Total diversion via home composting and Sink Your Waste scheme (tonnes / yr)	Additional prevention target for remaining food waste within MSW	Potential additional prevention diversion (tonnes / yr)
2007/8	6,505	2%	1,212
2010/11	8,066	10%	6,235
2013/14	10,359	15%	9,300
2020/21	15,030	25%	15,516

#### *Assumptions*

Recent reports suggest that approximately 216kgs of food waste are produced each year per household. (see note 26, p29) This is equivalent to 17% of MSW in Herefordshire and Worcestershire which is broadly consistent with the figure of up to 19% reported as part of the WRAP *love food hate waste campaign*.

We have assumed that each household participating in home composting will divert 60kgs of food waste per year via home composting (see note 27, p29), and that the diversion via food waste disposers outlined in *Table 3.6* is achieved. The remaining fraction of food waste in MSW can be targeted.

#### *Cost and benefit*

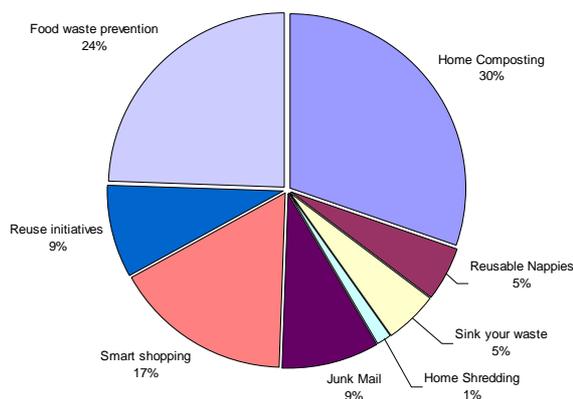
There is limited data available to support estimated costs for such a promotional scheme; however costs should include contribution to the salary of Local Authority staff and the association promotional and campaign materials. For this exercise we have assumed a promotions and campaign cost of £2 per household (inclusive of all associated costs) to be split equally between Junk Mail, Smart Shopping and Food Waste prevention initiatives. Taking account of this cost and the potential avoided cost of disposal, the net benefit of this initiative in 2020/21 is estimated to be £932,269. The overall net benefit of this initiative is can be seen in *Table 3.17*.

### 3.2 PREVENTION AND RE-USE ACTIONS AND OPTIONS IN PERSPECTIVE

This section of the report considers the net benefit of prevention and re-use initiatives and presents the contribution of individual initiatives to the overall waste prevention potential. It is important to note that Herefordshire and Worcestershire authorities have been running waste minimisation schemes for some time. Both authorities have experienced a below average waste growth rate (1%) per annum and at present (September 2008) the levels of waste are decreasing not growing.

The net benefit of prevention and re-use programmes needs to be considered when deciding on the most effective course of action and to allow decision makers to apportion resources appropriately. *Figure 3.1* highlights the maximum diversion rates that might be expected if the targets discussed in the preceding section are achieved. A combination of prevention and re-use programmes is recommended so the general message of the need to reduce waste is reinforced.

**Figure 3.1** *Relative Contribution of Prevention and Re-use Measures to total 'Avoidable' Waste at 2020/21 levels*



*Table 3.17* gives indicative details (see note 28, p29) of the likely impact of the waste prevention and re-use campaigns. The data shows the potential tonnage diverted and illustrates which scheme is most beneficial financially through the use of a ranking system.

A simple assessment of impact on householder behaviours has also been included, based on the Defra 4 E's (see note 29, p30) model which includes the initiative or scheme ability to:

- Enable;
- Engage;
- Exemplify; and
- Encourage.

**Table 3.17 Indicative Impacts of Implementation of Waste Prevention Initiatives and Schemes**

Initiative	Potential % reduction in MSW tonnage 2010/11	Potential % reduction in MSW tonnage 2020/21	Potential diversion tonnes / yr 2010/11	Potential diversion tonnes / yr 2020/21	Potential avoided cumulative disposal costs (rank)	Total cost (-) / benefit 2020/21 (see note 30, p30)	Influence over household behaviours	Overall net benefit (see note 31, p30)
Home composting	2.99%	4.37%	12,220	19,330	1 <sup>st</sup>	£1,044,495 (see note 32, p30)	****	★★★★★★★★
Real nappy project	0.31%	0.69%	1,266	3,051	7 <sup>th</sup>	-£28,862	***	★★
Sink your waste	0.14%	0.73%	587	3,213	6 <sup>th</sup>	£96,813	**	★★★
Home Shredding	0.14%	0.21%	577	923	8 <sup>th</sup>	-£9,589	*	★
Junk Mail prevention	0.50%	1.26%	2,034	5,569	4 <sup>th</sup>	£183,559	***	★★★★★
Smart shopping	0.68%	2.38%	2,778	10,516	3 <sup>rd</sup>	£555,919	***	★★★★★★
Re-use initiatives	0.50%	1.25%	2,042	5,523	5 <sup>th</sup>	-£9,555	****	★★★★★
Food waste prevention	1.53%	3.51%	6,235	15,516	2 <sup>nd</sup>	£932,269	***	★★★★★★
<b>TOTAL</b>	<b>6.79%</b>	<b>14.40%</b>	<b>27739</b>	<b>63641</b>	-	<b>£2,765,049</b>	-	-

## 4. CONCLUSIONS

It is evident from the information presented in the previous sections that Herefordshire and Worcestershire council's currently (September 2008) operate a significant number of successful waste prevention schemes and these help to reduce the amount of waste being sent to landfill. A 'Waste Challenge Team' has been established, with officers supporting many initiatives. The work of this team in conjunction with WRAP and various partners is recognised as very good practice, particularly with respect to, home composting initiatives. However, it is difficult to predict accurately what specific impact many schemes have had or will have if further developed. So, ongoing monitoring of such waste minimisation and prevention schemes will ensure that more accurate data is available for this purpose in the future.

Some waste minimisation schemes require a high initial capital expenditure but result in higher cost savings and higher diversion tonnages. It is evident that some schemes provide better value for money than others. This report should help guide the authorities' decisions when choosing to invest further in existing (September 2008) schemes and start up future initiatives.

From this appraisal it is clear that a number of campaign led schemes; focussing on Junk Mail, Smart Shopping and Food Waste prevention can have a large impact on diversion (together accounting for over 40% of the potential diversion by 2020/21).

Home composting, whilst already successful to a large degree, continues to provide the single most effective potential prevention measure in Herefordshire and Worcestershire (30% of the potential diversion assessed by 2020/21).

It is important to note that the assessment intends to be a guidance document to provide suggestions on how to increase waste prevention and re-use in Herefordshire and Worcestershire. It does not intend to set specific targets for the authorities.

The success of waste prevention relies on bringing about behavioural changes in householders, waste producers (such as packaging manufacturers) and retailers as well as better education and awareness raising, advertising and general assistance from authorities in getting the messages across. It is essential that these groups work together more effectively in order for these schemes to divert significant amounts of waste from landfill.

The results of this report have helped us prioritise which waste prevention initiatives the Partnership will focus on in the future. Resources will be focussed as a priority on enhancing home composting and food waste reduction initiatives with some additional effort directed to increasing junk mail prevention, promoting smart shopping and enhancing re-use initiatives.

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END NOTES:

- (1) Defra (2005) *Guidance on Municipal Waste Management Strategies*, July 2005, p. 7.
- (2) <http://www.defra.gov.uk/environment/waste/localauth/practice-guidance/pdf/infosheet10.pdf> p. 1. (Accessed October 2008)
- (3) *National Resource and Waste Forum / WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (4) *It was assumed that households defined as detached, semi-detached, terrace or bungalows have gardens. Data for H&W was taken from the National Statistics Web Site: [www.neighbourhood.statistics.gov.uk](http://www.neighbourhood.statistics.gov.uk) Household growth projections for each district have been taken from Communities and Local Government data: [www.communities.gov.uk](http://www.communities.gov.uk)*
- (5) *Defra Strategy Unit Report - Waste not Want not (2002)*
- (6) *National Resource and Waste Forum/ WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (7) *National Resource and Waste Forum/ WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (8) *Discussions with WRAP officers October 2008.*
- (9) *National Resource and Waste Forum/ WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (10) *Disposal costs are assumed to be £75.27 per tonne (un audited), which is the weighted average of the BV87 figure for the two authorities reported in Waste Challenge Team Evaluation Report, September 2008.*
- (11) *National Resource and Waste Forum/ WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (12) *Research by the EA (2004) determined that the market share of reusable nappies was less than 4% - Life Cycle Assessment of Disposable and Reusable Nappies in the UK, May 2005.*
- (13) *An updated lifecycle assessment study for disposable and reusable nappies (Defra, WRAP) 2008.*

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- (14) *The updated assessment referred to above includes a range of soiled disposal weights (page 13, table 2.2), with WRAP providing the highest based on a recent sampling exercise. We have used the highest weight for this exercise*
- (15) *Weight data taken from an Environmental Impact Study of Food Waste Disposers for Herefordshire Council and Worcestershire County Council by Dr Tim Evans 2007*
- (16) *Disposal costs are assumed to be £71.68 per tonne (unaudited), which is the BV87 figure for the Worcestershire reported in Waste Challenge Team Evaluation Report, September 2008.*
- (17) *National Resource and Waste Forum/ WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (18) *National Resource and Waste Forum/ WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (19) *National Resource and Waste Forum/ WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (20) *National Resource and Waste Forum/ WRAP Household Waste Prevention Toolkit 2006 (currently under revision October 2008)*
- (21) *Anderson (1999) Recycle, re-use, burn or bury?*
- (22) *Cameron-Beaumont, Bridgewater & Seabrook (2004). National Assessment of Civic Amenity Sites: maximising recycling rates at civic amenity sites. Future West, Network Recycling. Chapter 3.3*
- (23) *Cameron-Beaumont, Bridgewater & Seabrook (2004). National Assessment of Civic Amenity Sites: maximising recycling rates at civic amenity sites. Future West, Network Recycling. Chapter 3.3*
- (24) *Disposal costs are assumed to be £75.27 per tonne (un audited), which is the weighted average of the BV87 figure for the two authorities reported in Waste Challenge Team Evaluation Report, September 2008.*
- (25) *WRAP - Dealing with Food Waste in the UK, March 2007*
- (26) *WRAP - Dealing with Food Waste in the UK, March 2007*
- (27) *(WRAP - Dealing with Food Waste in the UK, March 2007*
- (28) *Based on data provided by the National Resource and Waste Forum Waste Prevention Toolkit, 2006. Data, where relevant, have been increased to account for the number of households and tonnages provided by the local authorities in comparison to the examples used in the Toolkit.*

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- (29) *Securing the future, UK sustainable development strategy 2005*
- (30) *This has been assessed through an amalgamation of the estimated capital and running costs plus the avoided disposal costs for the year 2020/21.*
- (31) *This is a simple summary assessment of the over all benefit of the initiative; taking account of the diversion, cost / benefit and influence over behaviours. The highest number of stars represents the scheme with the greatest overall benefit.*
- (32) *This cost has been adjusted to assume a £15 additional cost per compost bin provided in 2020/21 to cover the cost of retail and supply of bins and incentives to householders as support and grants cannot be guaranteed in future*