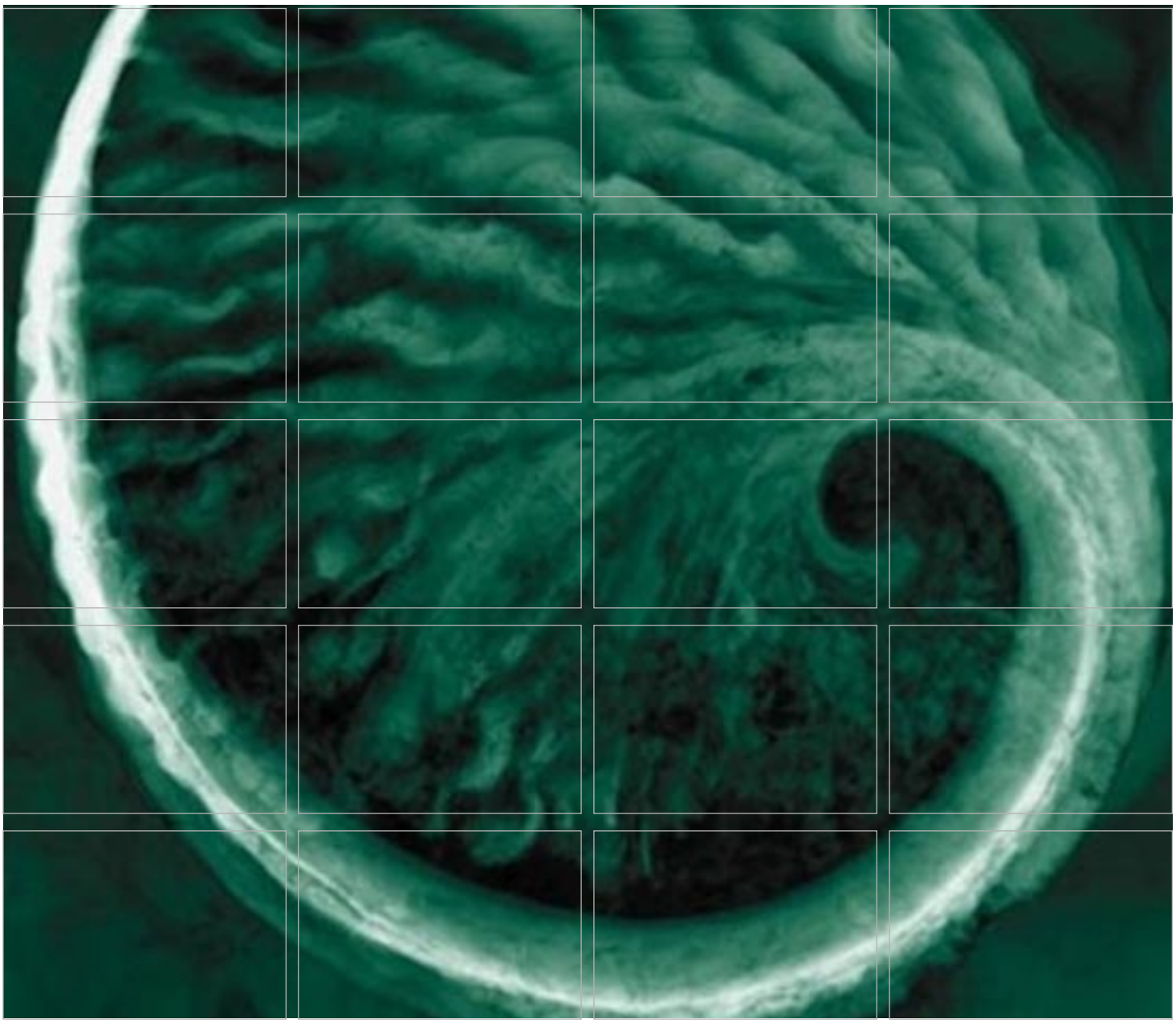

Waste Minimisation Options Appraisal

Annex 3

Report

March 2006

Kent Waste Forum

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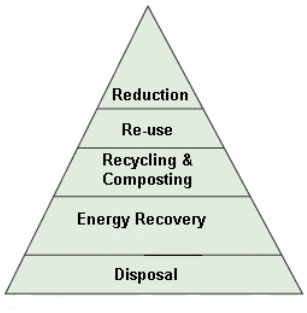
1 ASSESSMENT OF OPTIONS FOR WASTE PREVENTION AND RE-USE

1.1 INTRODUCTION

In line with its commitment to sustainable development, the National Waste Strategy 2000 aims to change the way waste is managed. Government policy seeks to break the link between economic growth and the amount of waste produced and to drive the management of waste up the waste hierarchy of reduction, re-use, recycling and composting, and energy recovery (Figure 1.1). Where waste is produced it should be viewed as a resource to be put to good use – disposal should be the last option for dealing with it.

Figure 1.1 Waste Hierarchy, Waste Strategy 2000



The Government requires that any strategy produced by local authorities should start by considering the practical extent to which the amount of waste produced can be reduced. Waste minimisation must take priority. Government suggests that authorities should then repeat the process for each subsequent stage in the hierarchy in turn (re-use, recycling & composting and energy recovery). Disposal of waste should be seen as the last option but should nevertheless still be addressed.

Kent MSW has grown from 754,188 tonnes in 2001/02 to 826,061 in 2004/05, an increase of 8.7%(1). This assessment will explore the potential for waste minimisation in terms of tonnes of waste avoided, and will provide an assessment of the options for increased waste prevention and re-use in Kent.

Consideration of the potential for alternate week collections of MSW or reducing bin size will not be made here. It has been suggested that such approaches may result in MSW reductions, however a separate study would be required to determine its overall impact. Instead approaches targeting specific waste streams that contribute to municipal solid waste (MSW) arisings will be assessed, and include:

- promotion of home composting

(1) Kent Joint Municipal Waste Management Strategy: Baseline Assessment - August 2005

- promotion of waste aware shopping
- reduction of junk mail through the mailing preference scheme
- promotion of reusable nappies
- diversion of trade waste
- promotion of business services that encourage the loaning, hiring and leasing of products and
- support for re-use of items, local waste exchanges and charity stores.

All of these approaches are reduction options, except the last which is a re-use measure.

This report identifies material streams that can be prevented or re-used and estimates landfill reductions. It outlines general benefits and risks involved with waste minimisation programmes for different waste streams.

The aim of this report is to:
- explore the full potential of waste minimisation
- examine how effective different waste minimisation options are
- assist with decision making in approaches to waste minimisation.

It is important to note that the data used in this report is up-to-date at the time of research. Growth estimates, for data such as MSW arisings and population, have been calculated according to current projections, and thus may change in the future. Many figures have also been based upon the Household Waste Prevention Toolkit prepared by the National Resource and Waste Forum.

1.2 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 push towards focussing 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 [(1)]:

- 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 as estimated in the Landfill Allowance Trading Scheme

- reducing the need for often unpopular waste management facilities

(1) Household Waste Prevention Toolkit August 2004 http://www.nrwf.org.uk/documents/NRWFToolkit_PART_A.pdf

- reducing the cost of waste management by reducing the need for waste collection, disposal, treatment and landfill levies, freeing up resources for other priority investments, such as public education and health care

- encouraging social inclusion and economic development through creating jobs and training opportunities 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 PREVENTION AND RE-USE INITIATIVES

This section explores each of the waste prevention and re-use opportunities for Kent. An introduction to each option is provided, including a list of risks and benefits. Prevention and re-use options are explored, including current approaches being undertaken in the County. Finally a cost/benefit summary involving the determination of whether Kent will achieve a net benefit through development and implementation of waste prevention and re-use programmes, is provided. Growth projections for MSW arisings are based on Scenario 8 –Kent waste development framework scenario [(1)].

This modelling looks at the overall impact that waste prevention and reuse programmes will have on the MSW arisings within Kent County Council. Many of the calculations and assumptions used here are based upon the *National Resource and Waste Forum (2004) Household Waste prevention Toolkit, August 2004.* It is recommended that Kent Waste Forum conduct in-depth, Kent specific waste analyses before embarking on large prevention and re-use initiatives.

2.1 PREVENTION: HOME COMPOSTING

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, helping to achieve the Landfill Allowance Trading Scheme (LATS) targets. The Government wants at least 50% of households home composting[(2)]. *Table 2.1* highlights benefits and risks associated with initiating further home composting programmes.

Home composting schemes may be eligible for WRAP and Community Composting Network support. There is also the availability of 'Compost Advisors' who can assist with educating the community.

Table 2.1 Home Composting - Benefits and Risks

Specific Benefits	Risks
• Reduced need to buy peat-based composts • Further public engagement/awareness • Reduced costs for collection and disposal • Avoidance of LATS penalties • Reducing resource/energy use	• 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.

Kent has adopted the promotion of home composting initiatives as a means of reducing household waste generation. *Table 2.2* outlines the current home composting practices within Kent.

(1) Kent's Municipal and Solid Waste Baseline Report, Prepared by Kent County Council, 27 October 2005. Growth rate in municipal waste arisings based on assumptions set out by Kent, 8) Kent waste development framework scenario.
(2) National Resource and Waste Forum (2004) *Household Waste prevention Toolkit. Part B: Specific Waste Prevention Activities.*

Table 2.2 Organics minimisation approaches in Kent

Organics minimisation approaches in Kent
Kent's War on Waste has been promoting home composting with compost bins offered to Kent residents. This has been promoted through the districts by road shows and through radio and newspaper ads. In April 2003 Kent War on Waste received £200,000 funding from DEFRA to promote home composting. £150,000 to subsidised home compost bins to residents and £50,000 to promote the scheme. A theatre company visited ten schools in each district in one week, 120 schools in total reaching some 36,000 children. The participating schools were given a compost bin and the children given information. This has continued in recent years – 120 schools per year benefiting from this service. In 2004/05 nearly 400 schools were provided with a free 330 litre compost bin. Additionally, an Exhibition Unit, visited all Districts and Boroughs, promoting home composting. Nearly 70,000 composting bins have been sold. All Districts and Boroughs are signed up to the programme and actively promote the scheme in-house and to their residents via promotional events and the Council newspaper.
Composter Advisor Scheme - There are over 150 volunteer compost advisors who have been trained to give good advice about home composting to members of the public.
The Waste Management Exhibition unit visits towns and villages across Kent throughout the year, giving advice to the public on waste reduction, re-use and recycling. Workshops for children, give away samples of compost, leaflets and recycled products are also offered.
All 12 Districts and Borough Council's are signed up to the home composting programme

There are further opportunities for all the Authorities in Kent to increase the level of home composting. *Table 2.3* summarises an assessment of the potential for diversion of garden and kitchen waste from households with gardens (1). If 50% of households participate in home composting, by 2019/20, it has been estimated that up to 4% of total MSW arisings can be reduced. In theory, over 60% of household waste (by weight) can be composted(2). However, in practice, over 30% of household waste can be composted easily at home, or in the community(3) – equating to approximately 360kg per household; realistic composting estimates are discussed below in the assumptions.

Table 2.3 Targets for home composting

Year	No. of households in County with gardens	Households provided with a compost bin	Target no. bins distributed (cumulative)	No. of additional bins required (cumulative)	Potential for additional diversion/yr (at 150 kg/hhld) at 70% participation
2005/06	481,789	5%	24,100	24,100	3,600
2006/07	498,234	20%	99,600	75,600	14,900
2010/11	518,790	35%	181,600	81,900	27,200
2019/20	539,346	50%	269,700	88,100	40,500

(1) It was assumed that dwellings defined as detached, semi-detached or terrace have gardens

(2) Strategy Unit Report - *Waste not Want not*

(3) National Resource and Waste Forum (2004) *Household Waste prevention Toolkit. Part B: Specific Waste Prevention Activities.*

Assumptions: Diversion tonnages are based on data from individual authorities that suggests home composting quantities typically range from 100-200 kg [1]; an average of 150 kg will be used for this assessment [2]. The number of households with gardens includes detached, semi-detached or terraced properties, resulting in 84% of properties considered to have gardens.

Cost and benefit: Costs involved in this program include infrastructure, such as composting bins, and two support staff to manage the programme and volunteers. Programme costs offset against avoided collection and disposal costs, will result in an estimated net annual financial benefit of £657,700 in 2009/10 and £1,779,800 in 2019/20 (see *Table 3.1*).

2.2 *PREVENTION: WASTE AWARE (SMART) SHOPPING*

Householders can influence waste arisings through informed purchasing to reduce waste entering the home. They can also reduce waste by buying more durable goods, or reusing and repairing products in the home. 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). Consumer purchasing decisions can impact upon more than 60% of waste generated from purchased goods[3].

Targeting various stakeholders will be essential to ensure the success of a smart shopping programme. Encouraging industry to reduce packaging materials in supermarkets 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. Benefits and risks associated with initiating a shop smart re-use campaign across the County are summarised in *Table 2.4*.

Table 2.4 Waste aware (smart) shopping schemes –Benefits and Risks

Specific Benefits	Risks
• Campaign may have wider benefits in raising environmental awareness • Reducing resource/energy use	• Difficult to achieve major reductions in waste without industry cooperation • Targeting commuters to London may be

(1) National Resource and Waste Forum (2004) *Household Waste Prevention Toolkit. Part B: Specific Waste Prevention Activities*
(2) It is estimated that 60% of household waste is compostable, however, only 30% of this material is easily composted in the home or community. Up to 360 kg of material could be composted each year, however real composting rates sees only 100 - 200 kg composted annually. Household Waste Prevention Toolkit [Unpublished version] Part B Specific Waste Prevention Activities August 2004 http://www.nrwf.org.uk/documents/NRWFToolkit_PART_B.pdf

(3) Household Waste Prevention Toolkit [Unpublished version] Part C Marketing Behaviour Change August 2004 http://www.nrwf.org.uk/documents/NRWFToolkit_PART_C.pdf p 22

Specific Benefits	Risks
	necessary as they may have different shopping patterns that may not be addressed in a ShopSmart scheme.

Currently, there are no waste aware (smart) shopping schemes in Kent, so the potential impact of introducing a scheme is likely to be great. *Table 2.5* summarises an assessment of the potential for diversion of shopping/packaging waste within Kent. If 50% of the community reduce their shopping/packaging waste (which is 60% of the waste stream) by only 10% by 2019/20, up to 3.0% of total MSW arisings can be reduced.

Table 2.5 Targets for reduction of shopping waste within current waste materials

Year	Expected reduction in waste generation per hhld	Households requiring change in behaviour	Target tonnage excluded
2005/06	0.06%	5%	2,600
2009/10	0.06%	20%	11,200
2014/15	0.06%	35%	21,100
2019/20	0.06%	50%	31,200

Assumptions: This analysis is based on studies(1) that have calculated:

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

Cost and benefit: The costs involved for this programme require contribution to the salary of a Local Authority coordinator focused on waste prevention and re-use. This cost versus avoided collection and disposal costs, will result in an estimated net annual financial benefit of £494,000 in 2009/10 and £1,374,200 in 2019/20.

2.3 PREVENTION: UNWANTED MAIL

Unwanted mail, including advertising materials and free newspapers, accounts for around 3% of household waste (2). Benefits and risks associated with initiating a Mailing Preference Service promotional campaign across the County are summarised in *Table 2.6*.

Table 2.6 Unwanted mail schemes –Benefits and Risks

Specific Benefits	Risks
• Once a household has committed to the Mailing Preference Service, reductions will be observed after 3-4 months • Where commingled recycling services are offered, the reduction of this waste stream will allow more capacity within kerbside boxes	• To achieve maximum reduction, householders will need also to commit to reducing unwanted mail by refusing handouts, flyers and free newspapers and magazines

(1) *Household Waste Prevention Toolkit [Unpublished version] Part C Marketing Behaviour Change August 2004* http://www.nrwf.org.uk/documents/NRWFToolkit_PART_C.pdf p 22

(2)*Household Waste Prevention Toolkit [Unpublished version] Part C Marketing Behaviour Change August 2004* http://www.nrwf.org.uk/documents/NRWFToolkit_PART_C.pdf).

Specific Benefits	Risks
• Reducing resource/energy use	• Reduce quantity of material for recycling

The Mailing Preference Scheme is not widely promoted in Kent thus opportunities exist to extend the programme.

Table 2.7 summarises an assessment of the potential for diversion of unwanted mail waste from households. If 50% of the community reduce unwanted mail waste by 2019/20, up to 1.0% of total MSW arisings can be reduced.

Table 2.7 Targets for reducing unwanted mail within the MSW stream

Year	Proportions of households participating	Target tonnage excluded
2005/06	5%	800
2009/10	20%	3,700
2014/15	35%	7,000
2019/20	50%	10,300

Assumptions: The quantity of unwanted mail generated within households was estimated at 3%(1).

Cost and benefit: Estimations for this programme require continued contribution to the salary of a Local Authority coordinator. This cost versus avoided collection and disposal costs, will result in an estimated net annual financial benefit of £163,000 in 2009/10 and £453,500 in 2019/20.

2.4 PREVENTION: REUSABLE NAPPIES

Using reusable nappies instead of disposable can contribute to the diversion of waste from landfill. *Table 2.8* highlights benefits and risks associated with expanding reusable nappy diversion schemes.

Table 2.8 Reusable nappies –Benefits and Risks

Specific Benefits	Risks
• Greater participation in schemes will ensure ongoing availability • Reducing resource/energy use • Potential for creation of jobs	• An initial investment in the nappies is required which can be an economic barrier to some families. • Participation may be dependant on environmental debates regarding the costs and benefits of real nappies

Kent currently has a number of reusable nappy initiatives that are available to the community, as outlined in *Table 2.9*.

(1) Household Waste Prevention Toolkit [Unpublished version] Part C Marketing Behaviour Change August 2004 http://www.nrwf.org.uk/documents/NRWFToolkit_PART_C.pdf p 22

Table 2.9 Reusable nappy incentives used in Kent

Reusable nappy incentives used in Kent
The Changing Nappies scheme was launched in 2000. The aim is to promote re-useable cloth nappies, provide information and reduce waste to landfill. There are currently 11 approved cloth nappy sellers in Kent who make a cash discount of up to £30 per baby off the purchase price of cloth nappies that is later reimbursed by the Council. Nappies purchased at other locations are liable for a £30 Boots voucher. The Scheme is promoted via Newspapers, Radio, Posters, Booklets, Doctors surgeries, Health magazines, Birth registration office, KCNN, antenatal classes, and hospitals.

Table 2.10 summarises an assessment of the potential for diversion of disposable nappies waste from the household waste stream. If 50% of parents use reusable nappies by 2019/20, up to 0.4% of total MSW arisings can be reduced.

Table 2.10 Targets for the promotion and use of Reusable Nappies

Year	Estimated No. of babies in County	Babies in reusables	Target No. of babies in reusables	Potential diverted arisings (tonnes)
2005/06	48,700	5%	2,400	400
2009/10	49,400	20%	9,900	1,700
2014/15	50,300	35%	17,600	3,000
2019/20	51,200	50%	25,600	4,300

Assumptions: Recent studies have estimated that babies generally wear nappies for 2.5 years(1). During this time, a baby will use approximately 3796 nappies (4 per day), equating to approximately 169.5 kgs per child over the 2.5 years(2). Based on these estimates, potential reductions have been calculated, as shown in *Table 2.10*. The impact of existing schemes has been considered in the calculations.

The number of babies in KCC was calculated by determining the percentage of the population in the 0-4 age category and multiplying by 0.625 (1/4 * 2.5) to ascertain the proportion of the population between the ages of 2.5. This figure was used instead of the number of babies born in KCC, as babies not born within KCC 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.

Cost and benefit: The costs involved for this programme require contribution to the salary of a Local Authority coordinator focused on waste prevention and re-use. This cost versus avoided collection and disposal costs, will result

(1) Life Cycle Assessment of Disposable and Reusable Nappies in the UK, May 2005, http://www.environment-agency.gov.uk/commondata/acrobat/nappies_1072099.pdf
(2) Life Cycle Assessment of Disposable and Reusable Nappies in the UK, May 2005, http://www.environment-agency.gov.uk/commondata/acrobat/nappies_1072099.pdf

in an estimated net annual financial benefit of £73,700 in 2009/10 and £190,700 in 2019/20.

2.5 *PREVENTION: TRADE WASTE DIVERSION*

Illegal disposal of trade waste at Household Waste Recycling Centres (HWRC's) contributes to the MSW arisings for Kent. Diversion of this material assists with managing and financing MSW and allows Kent to comply with the Duty of Care. In order to meet LATS targets, it is essential that this waste stream be diverted from CA sites to the commercial waste stream. *Table 2.11* highlights benefits and risks associated with initiating trade waste diversion programmes.

Table 2.11 Trade waste –Benefits and Risks

Specific Benefits	Risks
• Reduction in the calculated amount of MSW arisings • Potential increase in trade waste recycling due to unavailability of free disposal channels	• Commercial vehicle bans introduced without a permit system may result in complaints • Potential to encourage fly-tipping (1) • Potential for waste to be placed within kerbside bins (2)

Some common approaches to targeting illegal trade waste deposited at CA sites and HWRCs are already employed by Kent and summarised in *Table 2.12*. Additional methods include tackling waste from childminders and home workers and possibly implementing trade 'bring' sites.

Table 2.12 Trade waste minimisation approaches in Kent

Trade waste minimisation approaches in Kent
Height barriers are installed at all Kent Household Waste Recycling Centres to ensure large trade vehicles do not enter the sites. Customers using small commercial type vehicles may be asked to sign a form as their declaration that the waste they are disposing of is their own domestic waste. Pick-up vans are not allowed on site as they are deemed to be commercial vehicles.

In conjunction with current efforts, further reductions may be made to decrease the amount of trade waste in the MSW stream. *Table 2.13* summarises an assessment of the potential for diversion of trade waste from waste disposal facilities. If 50% of trade waste illegally disposed of at waste facilities is minimised by 2019/20, a reduction of 1.7% of total MSW arisings can be achieved.

(1) Dudley and North Lincolnshire noticed a slight increase in fly-tipping following the implementation of schemes, but this could this be linked directly to the scheme itself. Cameron-Beaumont & Bridgewater (2002). *Trade waste input to CA sites.* Network Recycling, WPSD. Chapter 4

(2) This may be reduced by auditing companies, asking them to provide their waste duty of care document given to businesses by waste providers

Table 2.13 Targets for the diversion of trade waste from MSW at HWRC's

Year	Total tonnage of trade waste at HWRC's	% Reduction of trade waste in MSW stream	Target tonnage excluded
2005/06	28,700	5%	1,400
2009/10	31,600	20%	6,300
2014/15	34,000	35%	11,900
2019/20	35,200	50%	17,600

Assumptions: The estimated amount of MSW collected in Kent in 2005/6 is 850,426 tonnes, with 26% of this waste expected to be collected at HWRC's. Network Recycling have estimated that approximately 13% of waste collected at HWRC's is illegal trade waste. This may be less in KCC due to current measures already in place, however, estimations on the reduction will not be made here.

Cost and benefit: Cost estimations for annual program costs, such as education and maintaining a permit scheme, compared with cost savings based on avoiding collection and disposal costs, will result in an estimated net annual benefit to Council of £278,300 in 2009/10 and £774,100 in 2019/20. Targeting this waste stream will result in an overall benefit to Kent.

2.6 *PREVENTION: PRODUCT SERVICE BUSINESSES*

The product service approach involves encouraging the loan, hire and lease of services rather than goods, or where goods are purchased, they are combined with services including upgrade, delivery, cleaning or maintenance, to enhance the longevity of the product. Overall, this approach reduces the amount of new materials entering the system and ultimately the future waste stream. This approach includes:

- libraries – public libraries, now include, music CDs, videos, DVDs and internet services, whilst toy libraries loan toys
- hire, rental and repair services
- Local Exchange Trading System (LETS) schemes – people have an account which are used for earning and spending 'credits' that can be exchanged for time and or equipment within the community eg mowing lawns in exchange for cleaning gutters such that each community member does not need to own a lawn mower and ladder (www.letslinkuk.org)
- milk rounds and other bottle return arrangements (eg with local breweries)
- organic box
- gardening services

- product refill services
- outside/food catering services – these can assist with minimising the use of disposable tableware and excessive food wastage through catering experience
- informal sharing of equipment such as DIY and garden tools

Local authorities can assist with establishing and supporting such schemes to ensure their long term stability. Product service promotion is crucial and should highlight all the benefits to the householder, while addressing any concerns. *Table 2.14* highlights the benefits and risks associated with product service businesses.

Table 2.14 Product service businesses –Benefits and Risks

Specific Benefits	Risks
• Reducing resource/energy use • Access to goods/services – offer more affordable access to goods • Job creation and training • Social inclusion • Reduction in MSW arisings	• Need for ongoing commitment from organisers and community to avoid unfair distribution of goods and services

Kent already has a range of services that are included in the above list. However, services are not widely promoted, neither is there a central information database where residents can access product service business information. Thus, there is further scope for all Authorities to promote these businesses and increase waste prevention. *Table 2.15* summarises an assessment of the potential for diversion of waste from households by using product service businesses. If 50% of households replace purchases with product services by 2019/20, up to 0.5% of total MSW arisings may be reduced.

Table 2.15 Targets for product service businesses prevention of waste materials

Year	Households requiring change in behaviour	Target tonnage excluded
2005/06	5%	200
2009/10	20%	1,200
2014/15	35%	2,800
2019/20	50%	5,000

Assumptions: Research suggests that diversions of between 0.5 and 1% of MSW arisings can be made through preventing waste generation by using services provided by businesses, rather than residents investing in buying/purchasing products themselves (1).

(1) National Resource and Waste Forum *Waste Prevention Toolkit* - Part A, August 2004

Cost and benefit: The costs involved in a programme may involve start-up grants for social enterprises and support funding for existing enterprises. These costs versus avoided collection and disposal costs will result in an estimated net annual financial cost of £52,100 in 2009/10 but a net annual financial gain of £221,400 in 2019/20.

2.7 *RE-USE: UNWANTED GOODS*

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

One study found that 77% of upholstered furniture and 60% of domestic appliances disposed at HWRC sites could theoretically be refurbished and re-used(1). Furthermore, HWRC sites committed to re-use have been found to generally have higher recycling rates, as a result of increased public awareness and staff motivation(2). Other schemes such as Freecycle, a web-based free trading system, have proven successful at allowing the community to maximise re-use opportunities. To maximise the re-use potential of the waste stream, development and delivery of a re-use scheme should be facilitated, coordinated and promoted by a strong network at a County level. This will also assist with raising awareness and participation. *Table 2.16* highlights benefits and risks associated with initiating re-use campaigns across the County.

Table 2.16 Re-use schemes –Benefits and Risks

Specific Benefits	Risks
• Creation of jobs and training opportunities • Provision of low-cost goods for low-income families, schools and charities • Help to meet requirements of the WEEE Directive • Second-hand and charity stores can distribute reusable materials and raise money • Reducing resource/energy use	• Poor public image/pre-conceived negative images of used goods can become a barrier to establishing a successful scheme • Concerns include security (eg computers), liability (H & S),and selling and keeping money on-site. • Goods donated to charitable organisations may be returned to HWRC sites (3). • Some re-use schemes may delay waste going to landfill rather than permanently diverting it.

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. There are several re-use schemes operating in Kent, outlined in *Table 2.17*.

(1) Anderson (1999) *Recycle, re-use, burn or bury?*
(2) 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
(3) This may be overcome by supplying charities with a subsidy to dispose these goods at HWS sites.

Table 2.17 Re-use initiatives used in Kent

Re-use initiatives used in Kent
Kent's War on Waste educates school children and promotes waste reduction and reuse. In 2005, children and teachers in over 300 Kent schools were educated.
Waste Busting - A Waste Management Education Pack for 8-14 year olds was written and distributed to all 700 KCC Schools in Kent, covering landfill, waste to energy, composting, recycling and waste reduction issues. This allows teachers to deliver information direct to students.
There are two dedicated waste reduction officers working in Tonbridge and Thanet for two years.
Scrapstore – the Scrapstore is based at the KCC Waste Management offices in Ashford and aims to divert waste from landfill by using it as a resource for educational purposes. The focus of the Scrapstore project is to divert mainly commercial, and some domestic waste, from landfill and use this 'waste' for art, craft and design purposes – "helping people use waste creatively". Educational facilities such as schools, colleges, community and voluntary groups register for membership with the Scrapstore (currently more than 1000 organisations are members). These members can then buy the scrap for art projects at a price much less than virgin materials – saving waste from landfill and re-using it / helping people to use waste creatively / saving customers money and educating them in the art of re-use! Membership to the Scrapstore is £20 per year, then when you visit you can fill a supermarket trolley with all the scrap you need for just £5 per trolley load. The Scrapstore also offers workshop sessions. These can range from art classes in schools to teacher training art classes.
Furniture – Kent work with several Kent-based furniture re-use groups where furniture is donated directly to them, is collected at HWRC's or by District Council bulky collection schemes. The furniture is refurbished (if necessary) and re-sold cheaply.
Shoe and Textile Recycling - All 18 HWRC's have Textile and Shoe recycling banks. The clothes are sorted with re-usable clothing being distributed to developing countries for re-use. Non reusable clothing is cut into squares and used as industrial wipes for industry.
Spectacles – Spectacles are collected at most HWRC's for re-use. They are delivered to Maidstone Prison where inmates sort, clean and grade them. They are then delivered to Vision Aid Overseas.
Market Development – KCC supports the work of ReMaDe Kent & Medway who are involved in creating and testing new markets for recycled materials.
Items accepted at HWRC's for recycling or re-use include books, textiles and shoes (soft toys are also accepted in these containers for re-use where possible), wood (7 sites), spectacles, furniture (5 sites), and engine oil.
Kent sell Nature Mix Compost made from the garden waste collected at HWRC's (£2.50 per 50 litre bag).

Kent can increase efforts to re-use goods that would otherwise become waste. *Table 2.18* summarises an assessment of the potential for diversion of reusable material waste from households. If 50% of households re-used goods by 2019/20, up to 2.5% of total MSW arisings could be reduced. This figure is in line with a Network Recycling study of nine HWRC sites with re-use systems in place, which found that 0.5–2% of HWRC throughput was realistically collected for re-use(1).

(1) 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

Table 2.18 Targets for re-use of current waste materials

Year	Reduction of trade waste in MSW stream	Target tonnage re-used assuming 2% reusable	Target tonnage re-used assuming 5% reusable
2005/06	5%	900	2,100
2009/10	20%	3,700	9,400
2014/15	35%	7,000	17,600
2019/20	50%	10,400	26,000

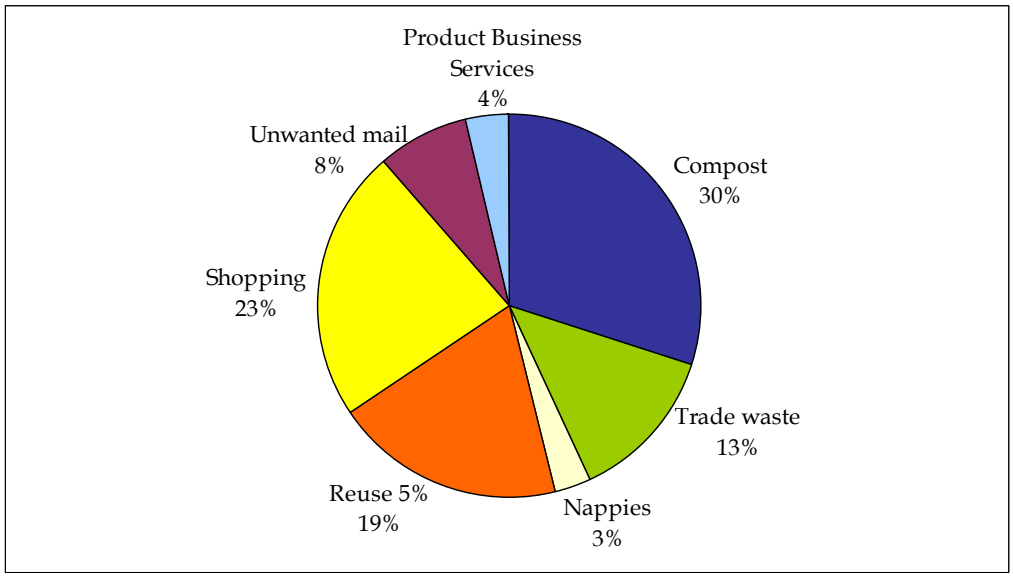
Assumptions: Generally, estimates lie between 2 and 5% of total MSW material arisings that can be re-used(1). These figures have been used to calculate the lower and upper bounds of what might be achieved in Kent. An in-depth waste composition analysis will allow Kent to better understand the potential re-use diversion rate from the waste stream.

Cost and benefit: The costs involved in a programme involve establishing a re-use facility, salaried staff and general running costs. These costs versus avoided collection and disposal costs, will result in an estimated net annual financial benefit of £411,700 in 2009/10 and £1,145,200 in 2019/20. These benefits are subject to any offset in re-use credits (2).

(1) Oxfordshire CC estimate that 5% of goods can be re-used or refurbished (as stated in the London Remade, London Borough of Richmond Upon Thames Waste Reduction and Re-use Strategy (2004); Environment Protection Authority Municipal Solid Waste, Source Reduction and Re-use further state that 2-5% of MSW arisings can be re-used (http://www.epa.gov/epaoswer/non-hw/muncpl/sourcred.htm).
(2) http://www.defra.gov.uk/corporate/consult/recycling-credits05/consultation.pdf

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 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 various prevention and reuse measures to the total 'avoidable' waste at 2019/20 levels



The indicative cost estimations(1) provided in *Figure 3.1* will assist with selecting the most cost-effective solutions and ensuring that disproportionate resource allocation does not occur. It is important to remember that the cost savings presented here are based upon diverting the total calculated potential tonnages of waste. If these targets are not achieved, neither will the cost savings. Accurate monitoring of household waste reduction and waste composition analysis would be required to understand any reduction in waste generation.

Estimated future costs do not include inflation or increases in collection and disposal costs (including increases in landfill levies and LATS penalties), thus greater financial benefits could be expected in the future.

(1) Based on data provided by the National Resource and Waste Forum Waste Prevention Toolkit, Part A 2004

Table 3.1 Estimated costs for implementation of waste prevention and re-use campaigns – 2006/7 – 2019/2020

Activities	Likely impact		Likely impact	Tonnes diverted per year		Tonnes diverted per year	Avoided costs @ £75 per tonne (1)		Avoided costs @ £75 per tonne	Capital Expenditure	Annual cost	Net annual benefit		Net annual benefit
Home composting	1.6%	to	3.9%	14,900	to	£40,500	£657,700	to	£1,779,800	£3,713,400(2)	£60,000(3)	£597,700	to	£1,719,800
Shop SMART	1.2%	to	3.0%	11,200	to	£31,200	£494,000	to	£1,374,200	£0	£8,300(4)	£485,700	to	£1,365,900
Unwanted mail	0.4%	to	1.0%	3,700	to	£10,300	£163,000	to	£453,500	£0(5)	£8,300(6)	£154,700	to	£445,200
Reusable nappies	0.2%	to	0.4%	1,700	to	£4,300	£73,700	to	£190,700	£0	£50,000(7)	£23,700	to	£140,700
Trade waste	0.7%	to	1.7%	6,300	to	£17,600	£278,300	to	£774,100	£5,000	£8,300(8)	£270,000	to	£765,800
Product ser. bus.	0.1%	to	0.5%	1,200	to	£5,000	£52,100	to	£221,400	£100,000(9)	£50,000(10)	£2,100	to	£171,400
Re-use	1.0%	to	2.5%	9,400	to	£26,000	£411,700	to	£1,145,200	£250,000(11)	£120,00012)	£291,700	to	£1,025,200
Communications(13)											£264,000			
Total	5.18%	to	12.97%	48,400	to	£134,900	£2,130,500	to	£5,938,900	£4,068,400	£568,900	£1,825,600	to	£5,634,000

(1) These costings are based on the BVPI data for 2004/5

(2) Based on one mobile shredder @ £100k plus £15 composter subsidy for 50% of households with gardens

(3) Three support staff @ £20K each to co-ordinate volunteers and projects

(4) One salary only – the cost of this coordinator has been evenly distributed amongst the programs that do not have support staff.

(5) Annual cost - part of overall WP communications budget

(6) One salary only – the cost of this coordinator has been evenly distributed amongst the programs that do not have support staff.

(7) No allowance has been made for offering cash subsidies

(8) One salary only – the cost of this coordinator has been evenly distributed amongst the programs that do not have support staff.

(9) Start-up grants for social enterprises

(10) Support funding for enterprises

(11) This is arbitrary and can vary considerably between projects - the report stated £500,000 however an estimate of £250,000 has been made for 1-2 reuse sheds, including installation, lighting etc

(12) Includes 3 salaried staff and general running costs - again, may vary considerably

(13) £0.8 per household on waste prevention campaign - part of wider waste communications stratety that will cost twice this

Sections 2 and 3 identified areas where resources can be allocated to ensure the maximum reduction of waste materials entering the MSW stream. Consideration was given to the:

- percentage of the waste stream that the waste type constituted;
- reduction percentage potential of the waste stream;
- target levels for the population;
- tonnages of MSW arisings diverted from landfill;
- savings of collection and disposal costs;
- costs of initial infrastructure and ongoing programme costs; and
- total net financial benefit of implementing a waste prevention or re-use programme

Based on these considerations, a selection of options has been developed:

Option 1: Do nothing

Option 2: Implement programmes that do not require any capital expenditure:
- trade waste diversion
- re-useable nappies
- waste aware (SMART) shopping
- unwanted mail

Option 3: Implement programmes that divert more than 2.5% of MSW arisings
- home composting
- waste aware (SMART) shopping
- re-use – unwanted goods

Option 4: Implement all programmes offered in this assessment

Figure 4.1 is a diagrammatical representation of the costs and benefits of implementing the above options. The costs are assessed against total tonnage diverted and total net benefits, based on 2019/20 diversion estimates of 50%of maximum potential reductions in the selected waste streams.

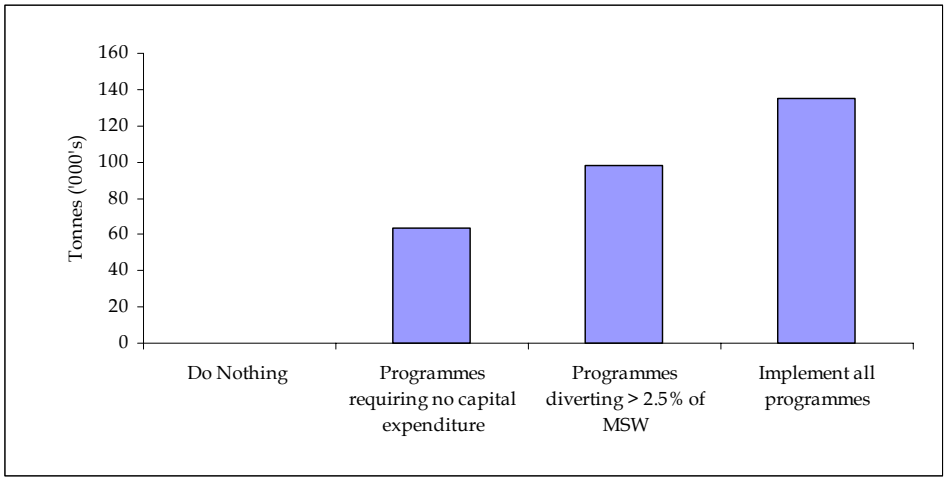
Despite Option 2 having the highest benefit per tonne, Option 3 still has the potential to save Kent almost £4.1 million per annum due to the large quantities of waste and the greater diversion potential of this option. Whilst Option 2 has the potential to save up to £2.7 million per annum, it diverts only 65% of the waste of Option 3 (*Figure 4.2*). Option 3 does have a negative overall benefit, however, this calculation does not include the impact of LATS savings. Such things should be considered when Kent is determining which waste minimisation and re-use options to implement.

Implementing all programmes will result in the greatest reduction of waste, however this option will require the greatest investment of both capital and ongoing costs. Implementing programmes that have no capital costs will result in the greatest net financial benefit per tonne.

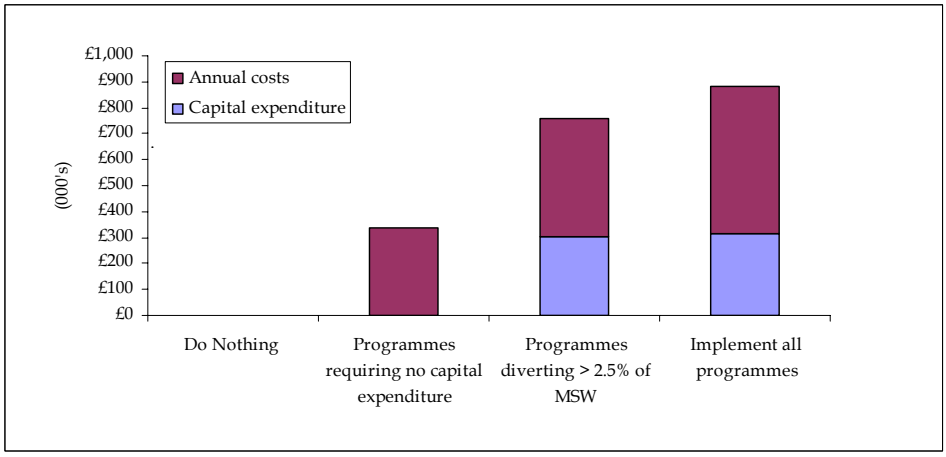
The figures used for all options, except 'do nothing' include a waste communications campaign for all households.

Figure 4.1 ***Diagrammatical representation of the financial costs and benefits of implementing waste reduction and re-use campaigns, based on expected diversion targets as at 2019/20.***

Total tonnes of material reduced



Annual costs and amortised capital expenditure costs(over 13 years) of implementing the various programmes



Savings per tonne from implementing reduction and re-use campaigns

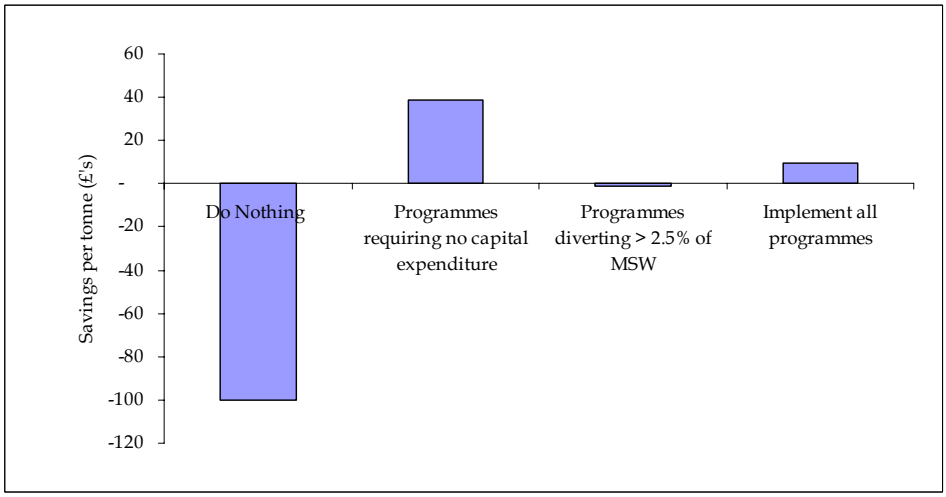
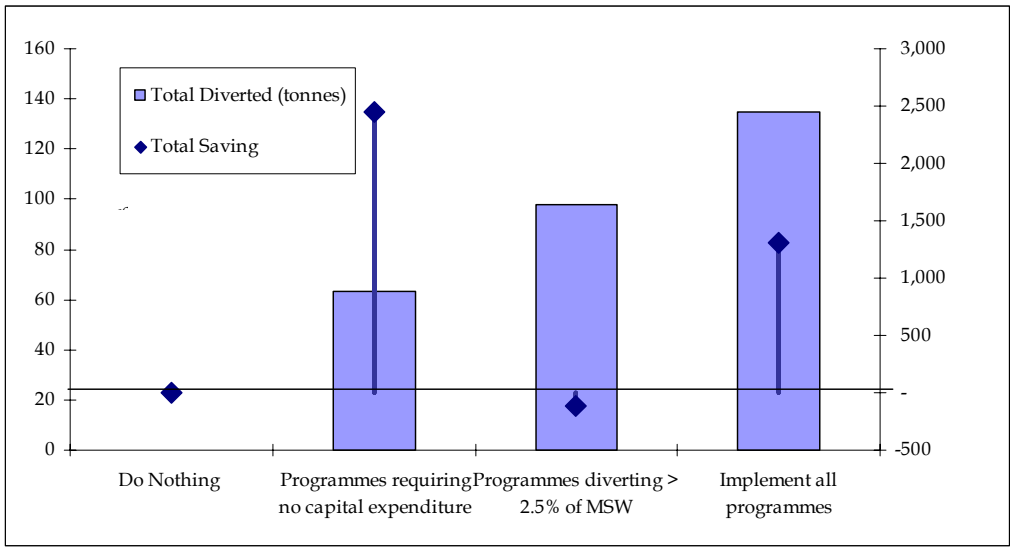


Figure 4.2 ***Diagrammatical representation of the total annual tonnages diverted versus the total annual savings***



It is recommended that Kent select one of the options analysed above that best meets their waste diversion objectives, yet one that can be adequately resourced to ensure the waste diversion tonnages are realised. As a minimum, programmes requiring no or minimal capital expenditure should be implemented, with an aim to focus on programmes that divert more than 2.5% of the waste stream. Focussing on programmes that divert less than 1% should only be considered where costs are low or where they can be incorporated into Council operations.

Once Kent selects an approach, they will then need to determine the best combination of programmes to deliver for each waste stream. Broad, quick and easily initiated programmes should implemented. The National Resource and Waste Forum *Waste Prevention Tool Kit, August 2004* (http://www.nrwf.org.uk/Reportsandpublications.htm) was developed for Local Government to provide guidance on how to

- develop and make a business case for waste prevention and re-use programmes
- select, plan and implement waste prevention schemes
- create and run a waste prevention communication campaign and change consumer behaviour

It is essential that ongoing monitoring be conducted to determine the success of any programme, to allow problems to be rectified and successes to be shared with other Counties.