The Norlands Foundation

A Strategic and Economic Overview of Municipal Waste Management

April 2004

The Norlands Foundation

The Norlands Foundation is an environmental body set up under the landfill tax Credit Scheme and was incorporated in 1997 as a company limited by guarantee.

It distributes landfill tax credits to a wide variety of local environmental and community projects. Over 75 projects have been funded. Most of these projects have been in the vicinity of the Norlands Lane landfill site near Chertsey in Surrey and the Beddington landfill site in the London Borough of Sutton.

In addition The Norlands Foundation has sponsored a small number of sustainable waste management research projects.

To date Thames Waste Management, as landfill operator, has provided The Norlands Foundation with funding from landfill tax credits and 10% seed funding.

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Executive Summary

Recommendations

There is striking evidence of regulatory risk in municipal waste management arising from seemingly arbitrary targets, separate control of planning and policy, mismatches between funding and obligations, and duplication of regulation. This risk is likely to increase the cost to the UK of meeting its European legal obligations, and to cause it to fail to meet its own domestic targets.

The targets that central government has set for local authorities to achieve by 2005, which require diversion of waste from landfill to recycling, composting and energy recovery, appear infeasible. Furthermore, they unnecessarily bring forward costs that exceed the benefits generated. There is no evidence that the feasibility, or the merit, of the 2005 targets have been fully tested. These targets should be revised downwards to bring them into line with the trajectory that takes the UK towards compliance with statutory EU targets in 2010. In addition, government should collect data to monitor investment in new infrastructure and public participation in new services, in order to track progress towards the targets.

Industry, government and local authorities should investigate carefully how to persuade householders to participate in kerbside recycling to achieve the levels necessary by the end of this decade. Participation rates will be a determinant of the cost of achieving the 2010 targets and the tonnage of waste that will have to be sent for energy recovery.

The government should publish and regularly update details of planning permissions sought, obtained and implemented for the recycling and recovery of waste, and compare these figures against the infrastructure capacity needed to deliver its waste targets.

Central government has made additional funds available for investment in new infrastructure. These funds appear to be of sufficient value. Local authorities are expected to turn to the private sector, through the Private Finance Initiative, for finance. In doing so, local authorities could adopt a contractual framework that transfers regulatory risk to the private sector, and raises costs. There are substantial risks arising from policy and regulatory uncertainty. These should not be passed on to the private sector. There is also doubt as to whether sufficient competition will be sustained between private-sector contractors if the planning system continues to give advantage to owners of existing waste management sites, and if the full costs of bidding for contracts, which are exacerbated by regulatory requirements, continue to be borne by the bidders. There is no evidence that the level of competition is being monitored. If competition begins to decline, local authorities may wish to pay part of the bidding costs incurred by companies in bidding for PFI contracts in order to maintain a level of competition.

Following the government's introduction of biodegradable municipal waste trading for local authorities, its intention to increase the rate of landfill tax to £35/tonne by 2010 should be abandoned. The landfill tax should be frozen at a lower level, sufficient to deliver targets for commercial and industrial waste management. Otherwise, if the escalator is continued, the additional receipts from municipal waste landfilling should be returned to local authorities.

Findings

The cost of municipal waste collection and disposal is estimated to rise at about 5% per annum compounded in real terms over the next 10–15 years. This is because of an increase in treatment and disposal costs, due in part to growth in waste arisings and in part to waste recycling and recovery targets.

The level of capital investment required in treatment and disposal (not including collection) to achieve these targets is estimated to be £1.8 billion by 2010 and £4.8 billion by 2015. Capital expenditure for new facilities of about £210m per annum is required between 2004/05 and 2006/07.

The target to increase recycling and composting of household waste to 25% in 2005 is equivalent to:

- all current kerbside collection schemes collecting three or more materials; and the above schemes having their geographical coverage extended by nearly half;
- households that receive separated kerbside collection approximately doubling the amount of material separated in 2001/02.

Executive Summary

The tonnage of paper collected municipally and recycled is calculated to rise from current levels of about 1.4 million tonnes per annum (mtpa) to 7 mtpa by 2016.

To achieve the government's waste treatment and disposal targets, all the incinerators currently with planning permission (1.9 mtpa capacity) will have to be commissioned by 2005, and planning permission will need to be sought for further incinerators at a rate of about 600,000 tpa each year for the foreseeable future, under the waste management scenario developed by OXERA for this report.

About 180 materials-recovery facilities, with an average design capacity of 40,000 tpa each, will have had to have been commissioned to deliver the recycling targets in 2005, and all of these will have to have received planning permission by the start of 2004 if they are to begin operations in time.

The additional cost of diverting waste away from landfill, in line with the strategy, increases over time and averages around £15/tonne over the next 15 years. This is much higher than the £4/tonne environmental costs of landfilling estimated in government research. The benefits of the strategy are outweighed by the costs.

Contents

Contents

1. Introduction

1.1 Aim

OXERA was commissioned in March 2003 by The Norlands Foundation to undertake a strategic, overview economic analysis of municipal waste management in the UK. The aim of the project was to identify any immediate problems in the delivery of the government's waste strategy, and to uncover longer-term obstacles, so that these might be addressed by the waste management industry, government, and interested third parties.

This paper provides data and scenarios that will be of interest to municipal waste management companies as they develop their business strategies. The scenarios are not forecasts of how the world will be, but models of what it might become if waste management develops in a particular way.

The theme of the paper is consistency. It examines whether the policy measures are consistent with the targets, whether the financing and funding arrangements are consistent with the investment required, and whether the targets are consistent with public attitudes to recycling and to land-use planning.

1.2 Background

The UK faces a range of international obligations concerning the management of its own waste, which are set out in EU law and are binding. Some of these regulations concern the process standards that waste disposal operations must achieve; others concern the permitted routes for the disposal of waste or the recycling of waste materials. The UK government has transposed, or is in the process of transposing, these obligations into UK law using policy instruments including taxes, process regulations, subsidy schemes, tradable permits, tradable obligations, information provision, research funding, and institutions to monitor, enforce and promote.

There is a widely held view that the combined package of obligations will only achieve its aims if considerable investment is made over the next few years. The magnitude of the challenge is set out clearly in DETR's Waste Strategy 2000, but it is not accompanied by a plan or financial projection for delivering the outcome. Recognising this, in 2001 the Prime Minister tasked his Strategy Unit in the Cabinet Office with a review of waste policy. The Unit's report went some way towards filling in the detail of a plan, but this paper shows how it left major issues in municipal waste management policy largely untouched.

The situation is as follows.

- Many of the policies have not been subject to cost–benefit analysis or post-introduction performance appraisal.
- No financial account has been made detailing all the monies paid out by central and local government and patterns of investment; accountability is therefore poor.
- The complexity of policy instruments and funding, and the absence of *ex post* appraisal, creates a perceived risk that regulations may be altered in the future, which may raise the cost of capital because changes in regulations may cause assets to be stranded and place revenues at risk.
- Opportunities for deregulation persist where there is double regulation (more than one regulation causing the same effect on the same waste stream or activity)—for example, the biodegradable municipal waste (BMW)[1] trading scheme and the landfill tax.

There has been no apparent systematic review of whether the municipal waste management targets can be achieved. There are a number of reasons why targets might be missed, including lack of finance, lack of facilities, planning barriers, inadequate participation by the public, and inactivity by local authorities. This paper exposes the extraordinary level of regulatory risk in this sector, and asks whether, by addressing this risk, the costs of injecting investment through the Private Finance Initiative (PFI) could be reduced.

[1] Biodegradable waste is any waste that is capable of undergoing aerobic or anaerobic decomposition. Municipal waste is waste from households or their waste that, by its nature or composition, is similar to household waste. BMW is waste that is both biodegradable and municipal. This definition is taken from Waste and Emissions Trading Act 2003.

1.3 Structure

The paper is structured as follows.

Section 2

- *Review of targets for the disposal of waste*—this section sets out the targets in place for the disposal of municipal waste, excluding the Directives covering end-of-life vehicles, electrical goods and packaging.

- *Overview of waste flows in the England and Wales*—using government data, this section describes where municipal waste arises at present, the nature of the waste generated, and the current disposal routes.

- *Future scenarios*—a scenario is presented of compliance with the Waste Strategy 2000 targets and the Landfill Directive.

- *Recycled materials*—the scenario includes the likely future generation of recovered materials for recycling.

Section 3

- *Financial flows between central and local government*—this section presents an overview of funding for waste management in England and Wales, and identifies issues that may hinder the use of the PFI for waste management services.

- *Analysis of the financial position of waste management companies*—this section reports the financial position of private waste management companies and their ability to fund large-scale capital expenditure (CAPEX).

Section 4

- *Institutional and financial incentives*—the interaction between the two principal economic instruments, the landfill tax and the BMW trading scheme, is investigated.

2. Targets and Future Scenarios for Municipal Waste Management

2.1 Legal framework and targets

Municipal waste management has attracted a considerable amount of policy debate over recent years (see Table 2.1).

Table 2.1: Waste management policy reports

Author	Date	Title
DETR	June 1999	'A Way With Waste: A Draft Waste Strategy for England and Wales'
DETR	October 1999	'Limiting Landfill: A Consultation Paper on Limiting Landfill to Meet the EC Landfill Directive's Targets for the Landfill of Biodegradable Municipal Waste'
DETR	May 2000	'Waste Strategy 2000 for England and Wales'
Cabinet Office	November 2002	'Waste Not, Want Not'
Defra	2003	'Government Response to Strategy Unit Report "Waste Not, Want Not"'
House of Commons Environment Audit Committee	April 2003	'Waste—An Audit'
House of Commons Environment, Food and Rural Affairs Committee	May 2003	'The Future of Waste Management'

The government's primary aim is to reduce the amount of waste produced—ie, to decouple it from economic growth, and divert waste away from the traditional landfill disposal route. In the absence of direct incentives to households and small businesses to reduce waste, this paper focuses on the targets and instruments directed at local authorities, for it is they who take responsibility for disposing of municipal solid waste (MSW).[2]

The local authorities have been set targets, through Best Value Performance Indicators, based on those found in the Landfill Directive, and going beyond it. The UK stands apart from most other European countries because of its long history of relying on landfill, and therefore has a long way to catch up. The Landfill Directive presents the UK with a choice: reduce landfill through recycling and composting, or use incineration. The government's clear preference is for recycling and composting. This is crystallised in mandatory targets on local authorities to recycle or compost, and to recover value (including energy) from waste (see Table 2.2).

Table 2.2: Waste strategy—principal targets on local authorities

Waste definition	Biodegradable municipal waste sent to landfill	Household waste	Municipal waste
Origin	Landfill Directive	Waste Strategy targets that relate to England	Waste Strategy targets that relate to England[1]
Legal requirement	Yes	No, but mandate on local authorities	No, but mandate on local authorities
Base year	1995	n/a	n/a
	Proportion of (base-year) waste stream landfilled	**Proportion of waste stream recycled or composted**	**Proportion of waste stream from which value is recovered**
2005	–	25%	40%
2010	Less than 75%	30%	45%
2013	Less than 50%		
2015		33%	67%
2020	Less than 35%		

Note: [1] There are separate targets for recycling and composting of municipal waste in Wales.
Source: DETR (2000), 'Waste Strategy 2000 England and Wales: Part 1'.

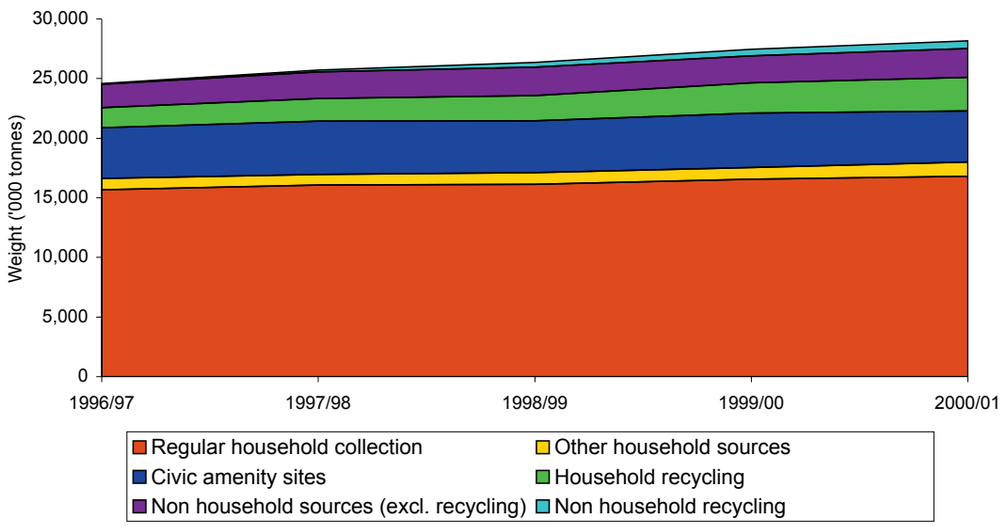
[2] MSW is collected from households and businesses in kerbside municipal collections, received at civic amenity sites, and deposited in local bring sites.

To accompany the targets, the government is seeking to make it easier to build waste recycling and composting plant. Planning Policy Guidance 10 on waste will be revised, beginning with a consultation in spring 2004, to encourage planning authorities to grant consent to new facilities. However, the new guidance is unlikely to have much effect on waste infrastructure until at least 2007, because of the lead time between planning permission and commissioning.

2.2 Municipal solid waste flows

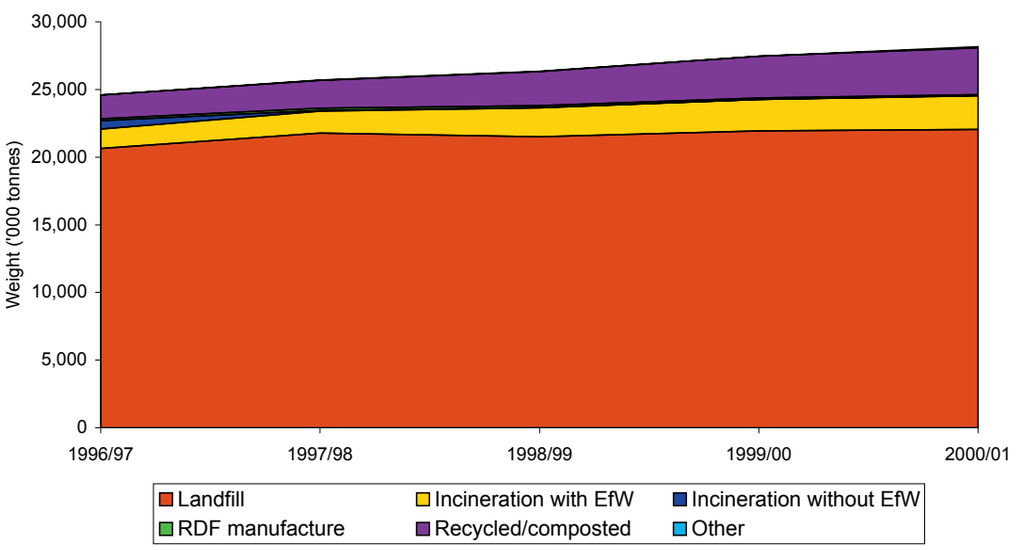
The rate of growth of MSW in England and Wales has been fairly constant—at about 2.75% per annum over the past few years—and the composition of its sources has been stable (see Figure 2.1). There have been more noticeable changes in the pattern of treatment and disposal of MSW, shown in Figure 2.2 and Table 2.3. Recycling and composting have played an increasing role and now account for just over 13% of MSW management.

Figure 2.1: Trend in source of municipal waste arisings in England (1996/97–2000/01)



Source: Defra (2003), municipal waste management statistics, available at www.defra.gov.uk.

Figure 2.2: Trend in municipal waste treatment and disposal in England (1996/97–2000/01)



Note: EfW, energy from waste; RDF, refuse-derived fuel.
Source: Defra (2003), municipal waste management statistics, available at www.defra.gov.uk.

Table 2.3: Municipal waste disposal routes, England, 1996/97–2001/02 (ktpa)

	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	Average growth rate (% pa)
Landfill	20,631	21,765	21,506	21,889	22,078	22,317	1.6
(%)	84	85	82	80	78	77	
Incineration with EfW	1,446	1,624	2,146	2,326	2,419	2,459	11.2
(%)	6	6	8	8	9	9	
Incineration without EfW	614	66	17	8	20	8	–58.0
(%)	2	0	0	0	0	0	
RDF manufacture	147	156	133	106	67	84	–10.1
(%)	1	1	1	0	0	0	
Recycled/composted	1,750	2,063	2,530	3,087	3,453	3,886	17.3
(%)	7	8	10	11	12	13	
Other	0	36	10	4	95	48	–
(%)	0	0	0	0	0	0	
Total	**24,588**	**25,711**	**26,342**	**27,421**	**28,132**	**28,801**	**3.2%**

Source: Defra (2003), municipal waste management statistics, available at www.defra.gov.uk.

2.3 Scenario of future treatment and disposal patterns

2.3.1 Assumptions

The numerical results in this paper have been generated from a model of municipal solid waste arisings, treatment and disposal. The assumptions that have been fed into the model are set out in Tables 2.4 to 2.6. They concern costs, value of recycled materials, and effectiveness of waste recovery for the main alternatives to landfill. Spot estimates of the value of each assumption have been used, rather than the ranges that are observed in real life. This does not invalidate the conclusions that will be drawn, and prevents the proliferation of scenarios and results that would otherwise have happened.

Table 2.4: Costs of collection and disposal

Technology	Unit size (ktpa)	Capital cost per unit (£m)	Operating cost (£/tonne)	Total cost (£/tonne)
Co-mingled waste collection	–	–	–	28
Kerbside recyclables/ putrescible collection	–	–	–	35
Composting	50	6	19	33
Materials-recovery facility (MRF)	40	2.8	27	34
Anaerobic digestion	100	28	12	49
Mass-burn incinerator	200	51	19	45
Landfill (excluding tax)	n/a	n/a	n/a	19 rising to 22

Note: Calculations assume 80% utilisation of plant capacity for composting, 95% for anaerobic digestion, 90% plant utilisation for incinerators and MRFs, 9% cost of capital, and 25-year amortisation period. The costs include the handling and transport costs of residues.
Source: Adapted from Eunomia Research and Consulting (2002), 'The Legislative Driven Economic Framework Promoting MSW Recycling in the UK', May; McLanaghan, S.R.B. (2002), 'Delivering the Landfill Directive: The Role of New and Emerging Technologies', November; OXERA calculations; and Thames Waste Management sources.

Table 2.5: Value of recycled materials

Material	Value (£/tonne)
Aluminium cans	600
Steel cans	15
Paper	10
Glass (from bring schemes; not recovered in an MRF)	5
Plastic	0

Source: Thames Waste Management sources.

Table 2.6: Effectiveness of materials recovery

Technology	Residual waste (% by weight)
Mass-burn incinerator	30
Anaerobic digestion	8 (of digested waste)
MRF (co-mingled)	12

Source: Personal Thames Waste Management sources.

2.3.2 Waste management scenario

OXERA modelled municipal waste treatment and disposal patterns in England between 2001 and 2020. It devised a scenario that would achieve compliance with the waste strategy targets set out in Table 2.2. The scenario involved separate kerbside collection of dry recyclables, green waste (garden waste) for composting, and mixed waste. A small proportion of the mixed waste was diverted either to incineration or to anaerobic digestion, but most was sent to landfill. Anaerobic digestion was built into the scenario as a representative new waste-processing technology. Separate collection of kitchen waste was not included because the Biowaste Directive prohibits its use in compost except for agriculture.

The scenario was constructed in stages. First, the collection of dry recyclables and composting was set to satisfy the government's recycling and composting target. This involved increasing the mass of dry recyclables and garden waste collected. Second, any waste not recycled, composted or digested was landfilled, if the BMW diversion target allowed. If the BMW diversion target was not met, some mixed waste[4] is incinerated or sent to anaerobic digestion in order to achieve the targets. Third, the mass of collection of dry recyclables was divided into four materials (glass, paper, plastic and metals) and converted into figures for the proportion of households covered by dry recyclables collection and the rate of participation of those households in the collections.

The scenario involved rates for collecting separated dry recyclables and green waste, and the fraction of mixed waste which was sent for anaerobic digestion (the chosen representative advanced treatment), as shown in Table 2.7. The first two columns of figures represent the proportion of an available waste stream (eg, dry recyclables) that is collected. The last two columns represent the division of the mixed waste between advanced treatment and conventional treatment.

Table 2.7: Scenario definition

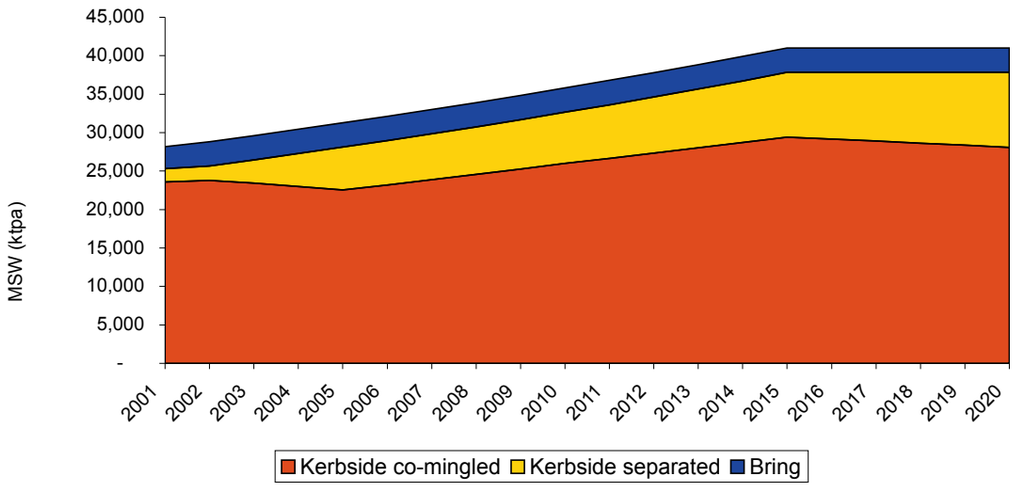
Scenario	Available materials collected (%)		Proportion of mixed waste sent for advanced treatment (anaerobic digestion) (%)	Proportion of mixed waste sent directly to landfill or incineration
Year	Dry recyclables	Garden (green) waste		
2005	47	25	6	95
2010	48	27	20	80
2015	50	35	27	65

2.3.3 Results

The results from this scenario are introduced below, and used to derive further figures and conclusions in section 3. Figure 2.3 shows rapid growth in the collection of dry recyclables. There is a significant increase in recycling required to achieve the targets for 2005, which becomes apparent as the analysis develops.

[4] Mixed waste contains biodegradable and non-biodegradable, recyclable and non-recyclable fractions. It refers to all the waste that has not been separated for collection as recyclable or green waste.

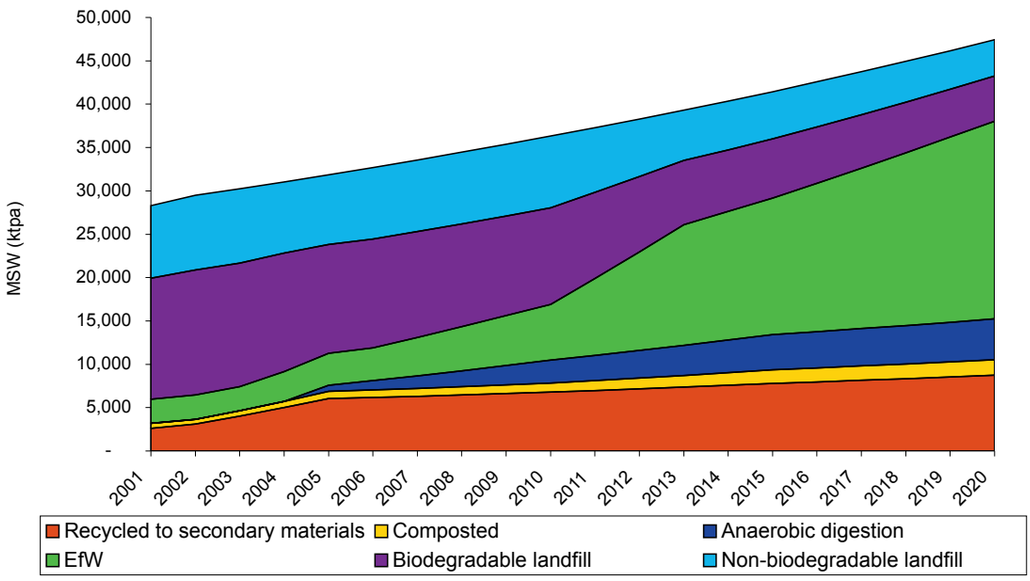
Figure 2.3: Scenario of MSW collection, England and Wales



Source: OXERA.

Separated kerbside collection increases from 1,200 ktpa in 2000/01 to 6,000 ktpa in 2004/05, as BMW is diverted from landfill to recycling in the years leading up to 2005. The next major effect, from 2010 onwards, is an increase in incineration, as shown in Figure 2.4. Incineration is needed because, by 2010, recycling rates are close to their maximum feasible level, and further diversion from landfill cannot be achieved through further recycling. The maximum feasible level of diversion of available waste is assumed to be around 64%, which is the product of 80% of households participating and 80% of available waste being diverted within those participating households.

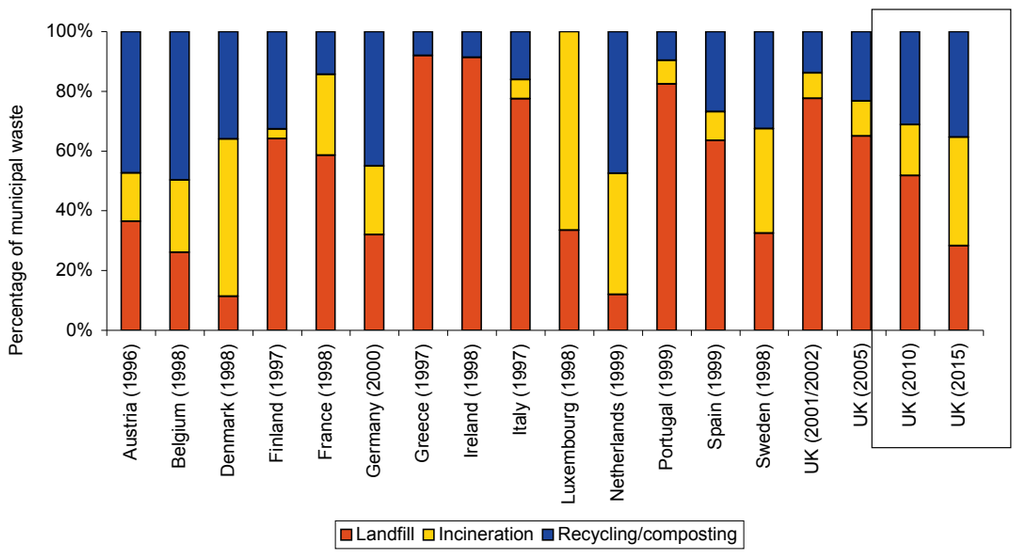
Figure 2.4: Scenario of MSW disposal, England



Source: OXERA.

The changing pattern of disposal between 2001 and later years is seen clearly in Figure 2.5. By 2005, the UK would have a disposal pattern similar to that in Spain in 1999, and, by 2015, it would be very similar to that in Sweden in 1998. These countries may offer lessons from their experience of operating these mixtures of waste disposal.

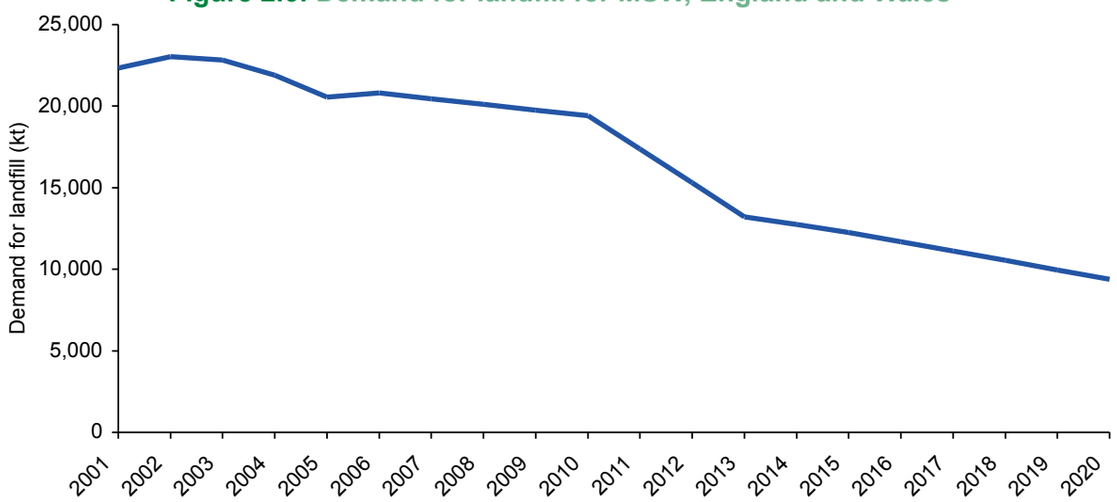
Figure 2.5: MSW waste disposal practice across Europe



Source: Eurostat and OXERA calculations.

The demand for landfill for MSW declines rapidly after 2010 in the scenario, as shown in Figure 2.6. However, overall demand for landfill may remain fairly constant if industrial and commercial waste streams continue to grow (not shown). Future landfill prices will be driven by demand for disposal and the availability of landfill supply, including the availability of planning consent for new sites.

Figure 2.6: Demand for landfill for MSW, England and Wales



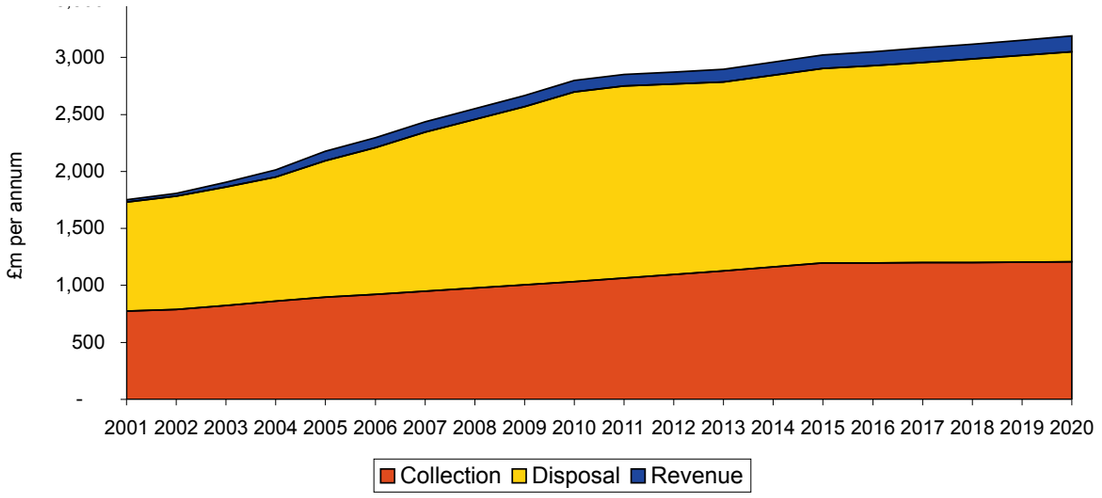
Source: OXERA calculations.

2.4 Cost implications

The increase in waste arisings and the higher costs of collection and disposal lead to higher public expenditure on MSW management. The model estimates £825m collection costs in 2003/04, and £1,040m treatment and disposal costs (net of tax), for England. This compares with government budget figures for net current expenditure for 2003/04, of £823m for collection and £1,182m for disposal.[5] The costs increase over time (see Figure 2.7).

[5] National Statistics, Office of the Deputy Prime Minister (2003), 'Local Authority and Revenue Expenditure England: 2003–04 Budget', statistical release, July.

Figure 2.7: Scenario of public expenditure on MSW management, England



Notes: Revenue refers to income from sales of secondary materials. Disposal cost includes landfill tax.
Source: OXERA.

Figure 2.7 shows a steady increase in the cost of waste management, especially treatment and disposal. Either this cost will have to be funded through central government payments to local authorities, or local authorities will have to source the funds through increases in Council Tax and waste charges. The year-by-year percentage increases in funding for disposal and collection are shown in Table 2.8.

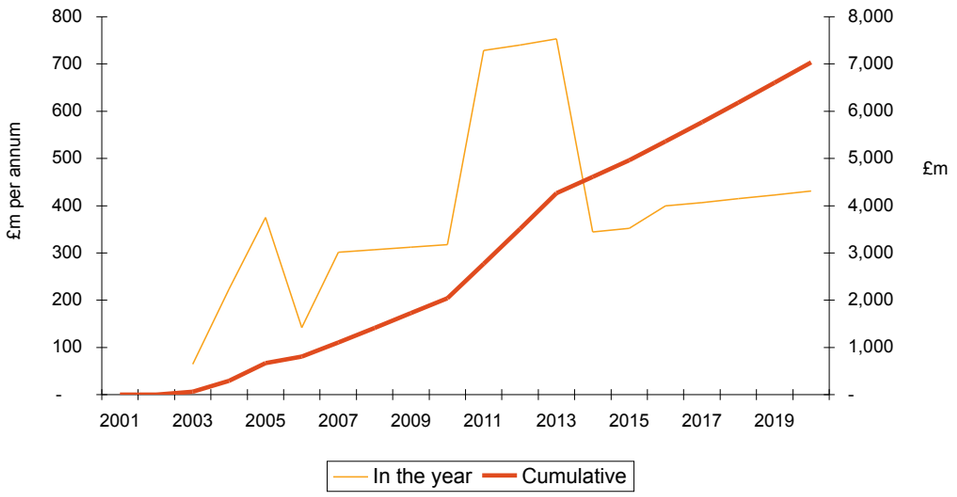
Table 2.8: Year-on-year increases in local authority funding requirement for municipal waste collection and disposal services (%)

Year	Collection services	Disposal services	All services
2002	2.0	4.1	3.0
2003	4.4	4.5	3.5
2004	4.3	4.8	3.6
2005	4.3	10.0	6.6
2006	2.9	7.5	5.6
2007	2.9	8.4	6.2
2008	2.9	6.1	4.9
2009	3.0	5.6	4.6
2010	2.9	6.4	5.1
2011	2.9	1.2	1.8
2012	2.9	-0.8	0.5
2013	2.9	-0.8	0.5
2014	3.1	1.4	2.0
2015	2.9	1.4	2.0
2016	0.1	1.5	0.8
2017	0.2	1.5	0.9
2018	0.2	1.6	0.9
2019	0.3	1.6	1.0
2020	0.2	1.7	1.0

Note: Excludes costs of the Waste Electrical and Electronic Equipment, and End-of-life Vehicle Directives, and any additional costs from disposal of fridges.
Source: OXERA calculations.

The expenditure figures mask the lumpy requirement for CAPEX on new facilities. Between 2001 and 2015, the total investment requirement is about £5 billion, and £250m per year over the next three years (2004/05–2006/07)—see Table 2.9 and Figure 2.8. Since local authorities are not permitted to borrow, this cash must either be borrowed by the private sector, or injected from central government as grants. In section 3, it becomes clear that central government finance is approximately sufficient to cover CAPEX requirements at present, if PFI credits are included.

Figure 2.8: Scenario of CAPEX requirement for disposal facilities



Source: OXERA.

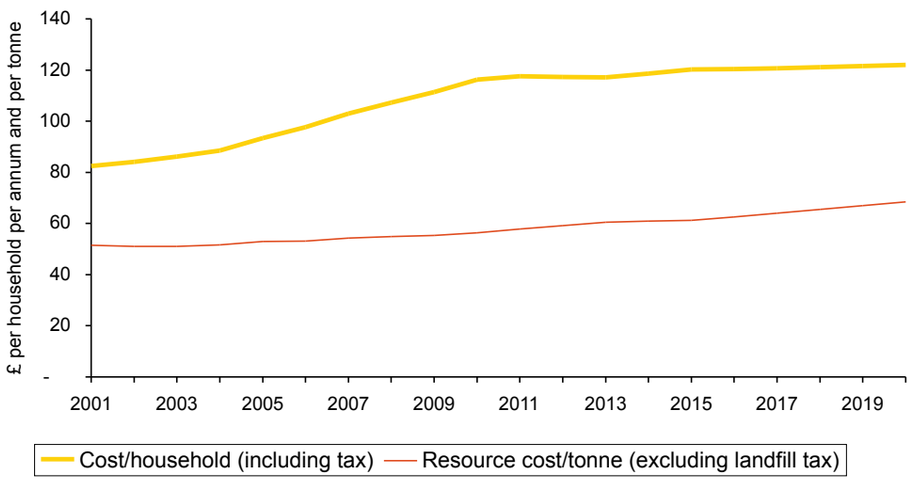
Table 2.9: Cumulative capital investment in new disposal facilities

By	£m
2005	660
2010	2,040
2015	5,000

Source: OXERA calculations.

The combined effect is an increase in waste disposal costs per household, but a smaller increase in waste disposal costs per tonne (see Figure 2.9).

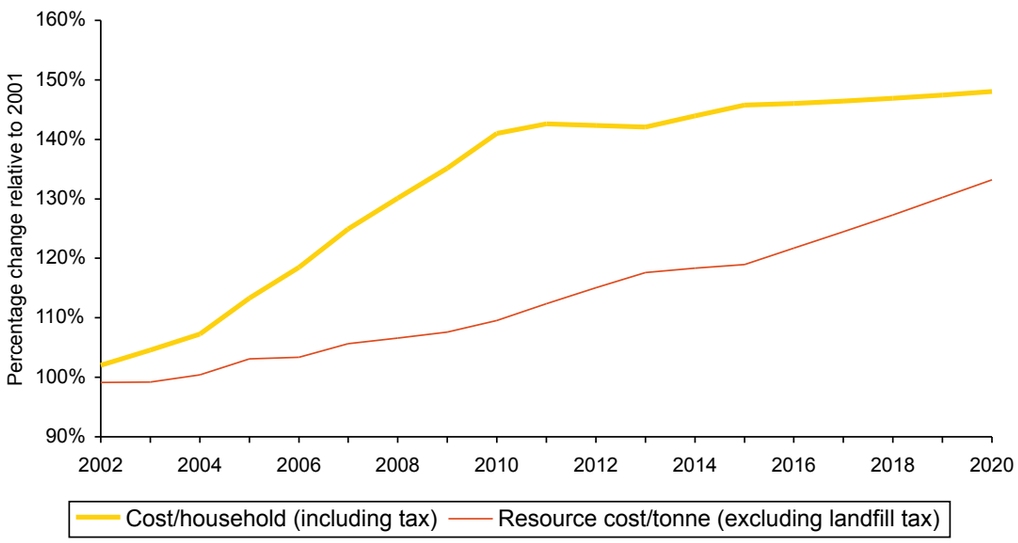
Figure 2.9: Scenario of waste collection, treatment and disposal costs per household and per tonne



Source: OXERA.

This figure has been replotted to show a percentage increase in costs (see Figure 2.10). A proportion of the increase in household bills is generated from higher waste arisings. It is also driven upwards by increases in the landfill tax. The figure shows that a large proportion of the increase in local authority funding requirement up to 2010 is due to the proposed increase in the landfill tax rate. The costs of waste disposal rise much less steeply if there is no tax increase. This suggests that one solution to funding municipal waste disposal is to return landfill tax receipts paid by local authorities to those local authorities in a way that preserves their incentive to divert waste from landfill—for example, on the basis of a standard estimate of household waste arisings. If this were done, the rate of increase in local authority expenditure to meet the waste targets would be modest.

Figure 2.10: Percentage increase in waste collection, treatment and disposal costs per household and per tonne

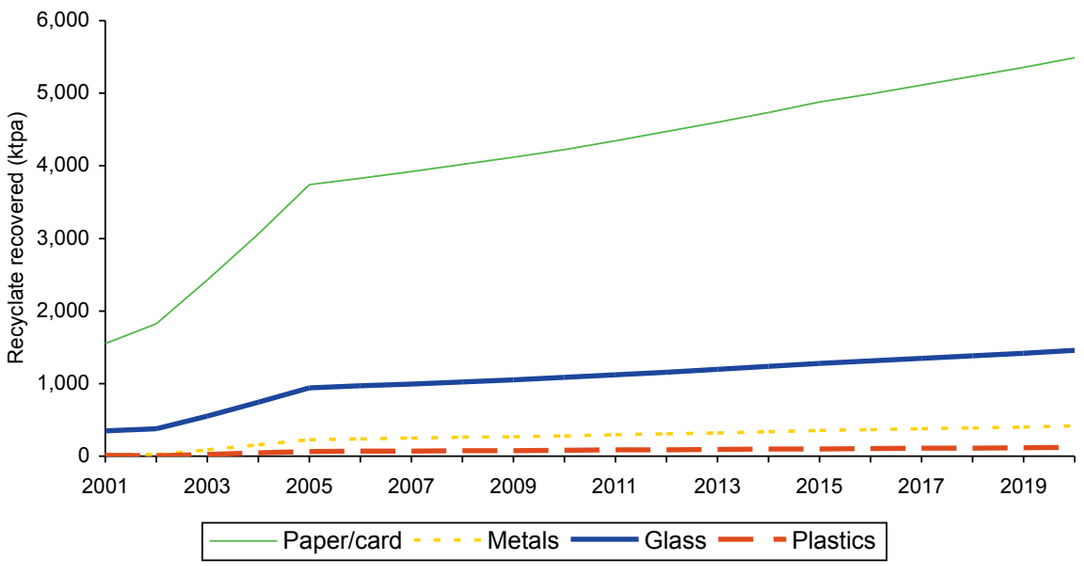


Source: OXERA.

2.5 Markets for recycled materials

The strategy to recycle waste will increase the supply of recyclate and the demand for reprocessing capacity to convert the recyclate into secondary (re-useable) materials (see Figure 2.11).

Figure 2.11: Scenario for recyclate recovery from MSW, England



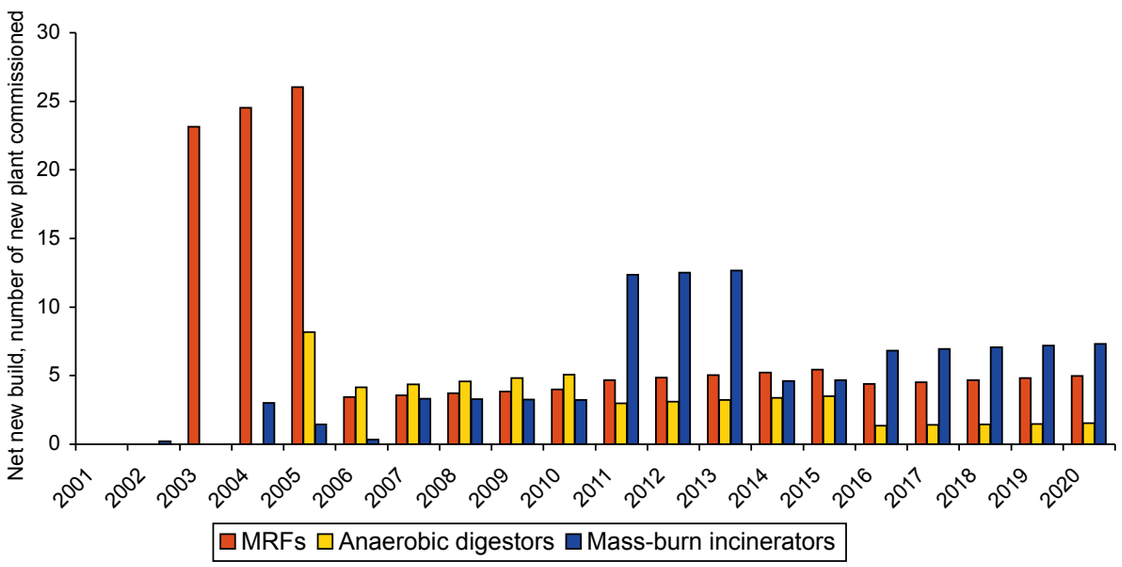
Source: OXERA.

For steel and aluminium cans, the capacity for reprocessing is already extremely large: 4.8 mtpa of metals and scrap equipment from industrial and commercial sources are already recycled. Additional recycling of metals of less than 1 mtpa would be absorbed with little impact on investment or recyclate prices. For paper, which is a more complicated international market in which recyclate is differentiated according to type of material, the increase in the amount collected will have a significant impact on recyclate volumes. However, because of the complexity of the market, it is difficult to predict the impact on recyclate prices. Currently, 5.3 mtpa of paper and card are recycled from industrial and commercial sources in the UK, so municipal recovery in the scenario shown above would roughly double current recycling levels. The picture for plastics is that the amount of plastic recycled will increase by a large proportion, but remain small in tonnage terms. Since recovered plastics are traded internationally, the increase in collection of plastic for recycling, might not lead to investment in reprocessing facilities or changed recyclate prices in the UK.

2.6 Planning and feasibility

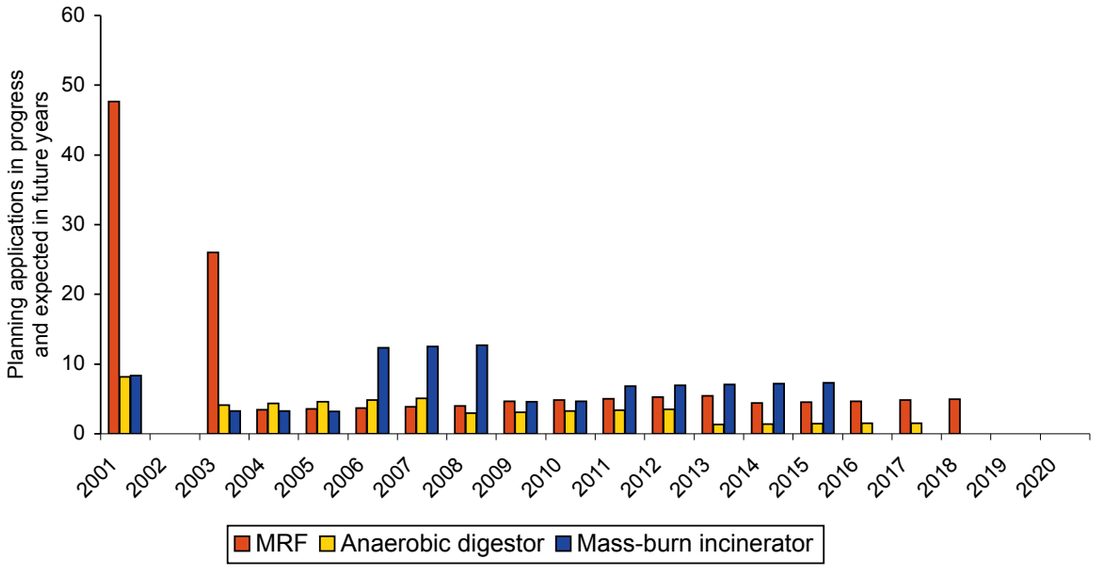
New incinerators, MRFs, anaerobic digesters and composting facilities will have to be built. Figure 2.12 shows the required number of plants of average size and the dates for their commissioning. The lead time for a plant is the time taken to secure planning permission and other operational permits (such as Pollution Prevention and Control authorisation) and for construction and commissioning. For MRFs and composting facilities, OXERA has assumed a lead time of around two years; for anaerobic digesters, three years; and for incinerators, six years. Working backwards from the date of commissioning, Figure 2.13 shows the dates by which planning permission will need to have been received in order to satisfy the Waste Strategy targets.

Figure 2.12: Scenario of new facilities: numbers of plants of average size and commissioning dates, England



Source: OXERA.

Figure 2.13: Scenario of new facilities: numbers of plants of average size, planning applications in progress and in the future



Source: OXERA.

Figure 2.13 reveals that a small number of incinerators and anaerobic digesters would need to be built, and a large number of MRFs. The modelling suggests that, in order to meet the 2010 targets, by the end of February 2004 there should have been nine incinerators (1.8 mtpa capacity), either with planning approval or under construction. Table 2.10 shows that there is likely to be sufficient incinerator capacity (1.9 mtpa) available, assuming that all the plant under construction and with planning permission are commissioned soon. However, unless there is action to encourage proposals for new plant that would open after 2010, there could be a mismatch between municipal waste management targets in 2015 and the waste management infrastructure available.

Table 2.10: Incinerator new build

Operator	Location	Size/tonne/yr	Planning status	Permit status[1]
NEWLINCS Developments	Grimsby	56,000	Granted	PPC application issued
Onyx	Portsmouth	165,000	Granted after appeal	PPC application expected this year
Onyx	Marchwood, Southampton	160,000	Granted	PPC application being determined
Surrey Waste Management	Capel, Surrey	116,000	Original permit withdrawn. New application expected	PPC permit issued
Grundons	Slough	400,000	Granted	PPC permit issued
Onyx	Chineham, Surrey	110,000	Granted	PPC permit issued
HLC Waste Management Services	Neath, Port Talbot	85,000	Granted	PPC permit issued
Waste Recycling Group	Hull	150,000	Application refused. Planning appeal in progress	PPC permit issued
Kent Enviropower	Maidstone, Kent	500,000	Granted	PPC permit issued
Riverside Resource Recovery	Bexley, London	580,000 (nominal capacity)	Application submitted; public inquiry pending	PPC application pending
Brightstar Environmental	Derby	55,000 up to 222,000	Granted	PPC application due to be submitted in 2003
Onyx	Sheffield	225,000	Granted	PPC application determined
County Environment Services	Roche, Cornwall	64,000	Application submitted	PPC application not yet submitted

Note: [1] PPC stands for Pollution Prevention and Control regulations.
Source: House of Commons Library (2002), 'Waste Incineration', Research Paper 51, updated by OXERA.

Of more critical importance is the construction of MRFs. OXERA found no published information consolidating the planning applications for MRFs in England, but the figure needs to be in excess of 75 (3 mtpa) in order for the 2005 targets to be met. MRF capacity is the strongest indicator as to whether the recycling targets will be met.

OXERA recommends that the government publishes regularly updated figures on planning applications for waste management facilities, with proposed opening dates, capacities, and proportion of capacity expected to be taken by MSW, and data for plant actually commissioned.

2.7 Waste collection practice

Over half of all households in England receive a regular kerbside collection of recyclables or compostibles, as shown in Table 2.11, and nearly half receive a collection of paper and card. The Household Waste Recycling Act 2003 requires local authorities to collect separately at least two types of recyclable waste in their kerbside collection schemes from all households by a date between 2010 and 2015, if the costs are reasonable.

The overall level of household waste collected for recycling and composting stood at only 12.4% in 2001/02.[6] Once materials taken to bring sites and civic amenity sites are subtracted from that figure, the low level of household participation in kerbside collection schemes is revealed (see Table 2.12). OXERA estimates that only 15% of the paper and card arising from households receiving kerbside paper and card collection in 2002 was put into the separate collection by those households, equivalent to roughly one in six households participating. The participation rate for glass is a little higher, at 19%, and green waste is a fraction higher still, at 21%.

Table 2.11: Kerbside collection practice, 2001/02

Number of materials collected	Percentage of households covered by kerbside scheme	Material	Percentage of households receiving kerbside recyclables collection
Four or more	24	paper and card	47
Three or more	35	glass	15
Two or more	46	compost	15
One or more	58	cans	21
None	42	plastics	8

Source: Defra (2003), 'Municipal Waste Management Survey 2001/02', Tables 10A and 10B.

Starting from 2002, OXERA built a scenario designed to achieve Defra's household recycling and composting targets in 2005, 2010 and beyond (see Table 2.12 overleaf).

[6] Defra (2003), 'Municipal Waste Management Survey 2001/02', paragraph 2.1. Available at www.defra.gov.uk/enivornment/statistics/wastats/mwb0102/wbch02.htm.

Table 2.12: Kerbside collection practice in future years

Year ending March	Percentage of households receiving separated kerbside collection				Percentage of available material captured from households in receipt of a separated kerbside collection			
	Paper and card	Glass	Compost	Cans	Paper and card	Glass	Compost	Cans
2002	47	15	15	21	16	19	21	2
2003	55	33	23	37	41	53	99	35
2004	62	52	32	54	59	62	80	47
2005	70	70	40	70	74	67	69	54
2010	80	70	50	70	68	71	58	58
2015	80	70	50	70	73	78	74	64
2020	80	70	50	70	74	80	73	66

Source: OXERA calculations.

The scenario shows that the current kerbside collections will have to be extended to include additional materials, so that, by 2005, 70% of all households receive kerbside collections of at least three materials. Also by 2005, household participation would have to increase between two- and fourfold to achieve diversion of the tonnages set out in the government's targets. Instead of one in six households participating in kerbside paper and card collections in 2002, by 2005, five out of six households would have to participate. Then, after 2005, increases in participation in other materials would be needed, but the pace of increase would be much lower. The question for the government and for local authorities is whether the public can be persuaded to change their waste disposal habits and to put effort into separating waste, and whether such a significant change can take place in such a short time. If the answer is that they cannot be persuaded, the government could instead reduce the 2005 target, and abandon its current front-loaded path towards the 2010 target. If it were to do this, it would have to adjust or abandon the targets set for local authorities through Best Value Performance Indicators, and would have to do so quickly, to allow the local authorities time to change their plans.

In the long term—and even in the short term too—there is a major issue to be addressed: how to achieve a much higher level of participation in kerbside recycling. Marketing campaigns might contribute, but 'pay-as-you-throw' charging warrants serious consideration. If marketing alone cannot deliver a sustained fivefold increase in participation for some recyclables, a charging regime would appear to be a necessity, and would have to be introduced before 2010.

2.8 Conclusions

The government's household recycling target is ambitious. It requires a dramatic increase in public participation in kerbside schemes from one in six households participating in 2002 to five out of six in 2005, taking paper and card collection as an example. It also necessitates a major expansion of collection infrastructure and MRFs, with over 100 new MRFs to be built. There is no information available to show whether these investments are being made, or whether the planning system can deliver it.

If the government proceeds with a steep increase in the landfill tax, it will have a major impact on local authority expenditure, and exacerbate the pressure on funding from increasing waste management costs. The government should consider compensating local authorities for increases in the landfill tax through a return of tax receipts in a way that will not discourage local authorities from diverting waste from landfill.

It is not clear what purpose lies behind the twin targets for household recycling and municipal waste recovery in 2005. They bring forward the statutory obligations in 2010, and impose obligations on local authorities through Best Value Performance Indicators that may be impossible to meet. They could be scrapped.

Additional incinerators will be required in the long term, although they will not need to be commissioned until the end of the decade (provided that other investments are made). Given the long planning timescale, new applications should be seen in the period 2004–06 if the rate of diversion of waste away from landfill is to continue after 2010.

3. Financial Flows within the Municipal Waste Management Sector

This section analyses how waste management is funded in the UK.

3.1 Sources of funding

Table 3.1 gives an overview of the elements of municipal waste management expenditure in the UK. In 2001/02, expenditure on waste disposal and waste collection in England and Wales amounted to £2,085m. Of this, 32% was accounted for by waste collection, 46% by waste disposal, and 20.5% by street cleaning.

Table 3.1: Expenditure on municipal waste management, 2001/02

Expenditure category	Expenditure (£m)	%
Waste collection	**672**	**32.3**
household collections	599	28.7
Waste disposal	**960**	**46.0**
landfill	491	23.5
incineration	39	1.9
materials recycling	78	3.7
recycling credits	36	1.7
Street cleaning	**428**	**20.5**
Capital payments	**25**	**1.2**
Total expenditure on waste management	**2,085**	**100**

Source: CIPFA (2003).

Municipal waste management is funded by local and central government, through three main sources:

- the PFI and other funds made available by central government;
- central government funding to local authorities for Environmental Protection and Cultural Services (EPCS);
- Council Tax revenues.

To access PFI funding, local authorities have to bid for money from the government's PFI credits fund, on the basis of a demonstration of best value for money. In doing so, there is direct competition between local authorities for this form of funding. In the case of EPCS funding and Council Tax revenue, there is a different form of competition. As waste management is only one of the services covered in the EPCS budget, there is competition for the expenditure of those monies within the local authorities.

Table 3.2 gives an overview of the central government funding of waste management from 2003.

Table 3.2: Overview of central government funding of waste management and other local authority services (£m)

	2003/04	2004/05	2005/06
ECPS spending block (covering many local authority services)	11,570	not yet available	not yet available
PFI credits	118	118	118
Waste Minimisation and Recycling Fund	90	–	–
Waste Management Performance Fund	–	90	90
Landfill tax credit scheme	65	71.5	71.5
Landfill tax industry recycling			65

Source: HM Treasury (2003), 'Budget 2003', April; Defra (2003), 'Our Strategy 2003–2006', May.

The annual value of grant and PFI finance is sufficient to fund the average annual level of investment expenditure in new municipal waste infrastructure between now and 2010. OXERA's research shows that the companies in the waste sector may find it relatively expensive to borrow on the capital markets. Since there is also evidence that the targets do not pass a cost–benefit test (see section 4), there are environmental and financial grounds in addition to infeasibility described in section 2, all of which evidence supports a relaxation of the 2005 targets.

3.1.1 Central government funding

The process of distributing grants to local authorities begins with the government deciding on an overall level of spending by local authorities and how much of this to pay in central grants. This is known as Total Assumed Spending (formerly known as Total Standard Spending). Around 80% of this is funded by Aggregate External Finance, which is made up of the Revenue Support Grant, other special and specific grants from central government, and redistributed income from the Uniform Business Rate. The difference between Total Assumed Spending and funds received from central government is made up by Council Tax income.

The Revenue Support Grant is distributed among the authorities by the Formula Spending Share (FSS), formerly known as the Standard Spending Assessment.[7] The FSS comprises a series of formulae that are applied uniformly to all authorities and are based on authorities' social, economic and demographic characteristics. The intention is to provide a level of funding for a standard level of service by all authorities across the country. The structure of the formulae is as follows:

- a basic amount for each member of the population, which is the same for each authority;
- a deprivation top-up, which allows for the additional costs of providing services in deprived areas;
- an area cost top-up, which recognises that wages vary across the country;
- other top-ups, which address a range of cost pressures, such as rural sparsity, density, and the volumes of visitors and commuters.

3.1.2 EPCS and FSS review

The government uses different FSS formulae for groups of services provided by councils. For example, budgets for services such as education, police, fire, and highway maintenance are individually determined by separate FSS formulae. The services of waste collection and disposal are included in the EPCS. The EPCS block provides for a variety of services—basically for all the services not covered in any of the other budgets—hence, its former name, the 'All Other Services' block.

At district level, the EPCS block includes, in addition to waste collection, services such as arts facilities and activities, museums and galleries, parks, private housing, recreation, sport and tourism. At county level, the EPCS block includes, in addition to waste disposal, civil defence, libraries, buses, school-crossing patrols and sheltered employment.

One of the issues also raised by councils is that the FSS formula used to determine the EPCS block does not adequately reflect the relative need for expenditure on waste collection and disposal. Table 3.3 shows that the growth in EPCS has failed to keep up with the actual costs of waste disposal and collection. Waste management as a proportion of the EPCS block increased from around 15% in 1996/97 to more than 20% in 2002/03. The increase in waste management has the potential to be at the expense of budgets for other services within the EPCS block.

[7] In 2002, the government reviewed the Standard Spending Assessment formulae, the predecessor of the FSS, made a number of changes to them and introduced the formulae under a new name, the FSS. Office of the Deputy Prime Minister (2002), 'Local Government Finance: Formula Grant Distribution: A Consultation Paper', July.

Table 3.3: Funding and expenditure on local authority services and waste management

Year	EPCS (£m)	Actual spend on waste disposal and collection (£m)	Actual spend as % of EPCS block
1996/97	7,397	1,135	15.3
1997/98	7,210	1,272	17.6
1998/99	7,767	1,345	17.3
1999/2000	8,073	1,503	18.6
2000/01	8,269	1,592	19.3
2001/02	8,587	1,730	20.1
2002/03	8,961	1,930	21.5

Source: CIPFA (2003).

The FSS formula for the EPCS block consists primarily of an amount of money per resident, with adjustments for commuters and visitors, population density and sparsity, and a range of socio-economic factors. It is questionable whether the factors included in the adjustment are related to the amount of household waste generated at a local authority level. Indeed, a study commissioned by the Society of County Councils shows that volume of waste generated in any authority is largely population-based and unrelated to factors such as household size, household composition or socio-economic factors.[8] The Society of County Councils has suggested that a separate FSS formula for waste management could be introduced.

The FSS for EPCS is simpler than its predecessor, the Standard Spending Assessment, and enhances the allocation per resident. The government acknowledged that the EPCS is markedly different to the other FSS service blocks, in that the services covered are much more diverse and have many different client groups. However, the government decided not to introduce a separate FSS for waste management. Instead, it increased the allocation per resident within the FSS and reduced the top-ups for deprivation and, in particular, for population density.[9]

Although the review of the FSS resulted in a significant increase in the total EPCS budget, there is no guarantee that the growth in the EPCS block will keep pace with that in the actual costs of waste disposal and collection. As explained in section 2, compliance with regulation on waste management and targets set by the government is likely to result in significant increases in costs.

Other sources of funding for waste management include the PFI, landfill tax and landfill tax credit scheme, and a variety of funds aimed at recycling and composting. The PFI is discussed below.

3.2 The Private Finance Initiative

The analysis in section 2 shows that a significant amount of investment is required to comply with the EC Directives and UK waste targets. Local authorities cannot finance this on their own balance sheets, and many are turning to the PFI to finance new infrastructure, see Table 3.4.

The PFI allows local authorities to purchase waste management services through long-term contracts, using private-sector management skills and placing private finance at risk. The waste and recycling activities show characteristics that make them, in principle, suitable for PFI investment. Waste disposal is a strongly outcome-oriented process. The targets set by EC Directives and the UK government mean that the local authorities can define outputs, and make use of private innovation and expertise to deliver them. Furthermore, activities in the waste management sector involve the procurement of significant capital assets, such as incinerators, which local authorities are unlikely to be able to finance themselves.

Table 3.4 shows the PFIs in the waste management sector, the number of which has so far been limited.

[8] Society of County Treasurers (2000), 'Research into Waste Management and SSA', June.

[9] See also Deputy Prime Minister (2003), 'The Government's Response to the ODPM: Housing, Planning, Local Government and Regions Committee Report: Local Government Finance: Formula Grant Distribution', February.

Table 3.4: PFIs in the waste management sector

Year signed	Project	Local authority	Investors	Budget (£m)	Length of contract (years)
Sept 1997	Baldovie Waste to Energy Plant	Dundee District Council	BICC, Kvaerner Investments, Dundee City Council	42	20
Oct 1997	Dudley Waste to Energy Plant	Dudley Metropolitan Borough Council	CIBC, Innisfree, MES Ltd	40	28
Oct 1997	Hanford Waste to Energy Plant	North Staffordshire Council	CIBC, Innisfree, MES Ltd	n/a	n/a
Oct 1997	Integrated waste management contract	Isle of Wight	Island Waste Services	44	25
Dec 1998	Various waste disposal facilities	Hereford and Worcester County Council	Focsa Services Ltd	490	25
April 1998	Various waste disposal facilities	Kirklees Metropolitan Council	United Waste Services, Kirklees Municipal Council	41	25
June 1999	Various waste disposal facilities	Surrey County Council	Sita	90	25
Jan 2002	East Sussex, Brighton and Hove Waste Partnership	East Sussex County Council	Onyx	49	n/a
Dec 2002	Integrated waste management contract	East London Waste Authority	Shanks	625	25
Sept 2002	Neath Port Talbot	Neath Port Talbot and Bridgend County Borough Councils	HLC Environmental Projects	n/a	> 20
Nov 2003	Integrated waste management service	Leicester City Council	Biffa	300	25
Expected: April 2005	Integrated waste management service	South Gloucestershire County Council		Expected around 320m	25 (to begin in April 2006)

Sources: County councils concerned, Public Private Partnerships Programme, and PPP Forum.

In the past, PFIs have mainly been used for the construction of buildings (including their servicing and maintenance), such as schools, hospitals, police and fire stations, and for various transport projects. Contracts used for these projects may not necessarily serve as a model for PFI projects in the waste management sector. While it might be possible to specify the outputs of a waste PFI project, in practice the local authority is uncertain what outputs will be required of it over the lifetime of the contract, because of changes and uncertainty in waste policy, environmental regulations, and land-use planning decisions. Overall, the regulatory risk inherent in waste PFI contracts is exceptionally great. While the solution may be to take action to reduce regulatory risk, in the mean time the consequence could be that too few PFI contracts are successfully closed, that few companies bid for those contracts, or that they are more expensive than they need be. The difficulty of obtaining planning permission for new infrastructure already places at an advantage companies which own sites that might be developed for new infrastructure, and discourages other companies from bidding.

On the basis of interviews with several different parties in the waste management sector, the following factors have been identified that could affect the feasibility of PFIs.

- *Uncertainties regarding future regulations and waste targets*—local authorities face a degree of uncertainty regarding future regulation of waste management and UK waste targets. This means that they may be reluctant to enter into long-term PFI contracts where they carry the risk of regulatory changes. There is evidence that local authorities seek to pass on regulatory risk to contractors, even though it may be more efficient to bear these risks in the public sector. A lesson from nuclear clean-up contracts in the USA is that excessive transfer of regulatory risk to the private sector is inefficient.

- *The split of responsibilities between district and county councils*—unitary or metropolitan councils are responsible for both waste collection and waste disposal. However, in many areas these two responsibilities are split between county councils (responsible for waste disposal) and district councils (responsible for waste collection). County councils find it difficult, if not impossible, to enter into long-term contracts with waste management companies without the commitment from the relevant district councils to deliver certain volumes of certain types of waste. In recognition of this, the Waste and Emissions Trading Act 2003 gives waste disposal authorities powers to direct waste collection authorities, and requires them to agree joint waste management strategies. This is an example where regulatory risk has been reduced. It remains to be seen whether the local authority financial arrangements are sufficiently flexible to allow a redistribution of waste management costs between district and county councils in the interest of reducing overall costs.

- *Planning permission*—waste management companies often find it difficult to obtain planning permission. Public opposition to new waste infrastructure, in particular incinerators, has been vociferous, and, although this could change, it is likely to make the building of new facilities difficult. Uncertainties about planning permissions affect the feasibility and success of PFI projects (see section 3.4).

- *Financial position of waste management companies*—as further explained in section 3.3, private companies charged with the construction of waste management infrastructure often fund the initial stages of the project on their own balance sheets. However, the analyses in section 3.3 show that some waste management companies in the UK are likely to find it expensive to raise new capital. They may also be reluctant to bear bidding costs, which are around £0.5m–£1.5m per contract. The level of competition for PFI contracts should be monitored closely. If it declines, it may be worthwhile paying a proportion of the bidder's costs, particularly those costs associated with regulatory approvals, such as impact assessments, planning permissions and environmental consents.

Addressing these issues may make the use of PFIs for waste management services more cost-effective.

3.3 Financial position of private waste management companies

This section analyses the financial position of eight large companies that participate in the UK waste management sector. The analysis is based on publicly available accounting data from the profit and loss accounts and balance sheets of the companies involved.

The financial strength of a company affects the cost of its borrowing and hence the spread in borrowing costs between the company and the government. In turn, this affects the net benefit from efficiency savings under private-sector delivery compared with lower public-sector financing costs.

A significant proportion of the privately owned waste management companies in the UK are subsidiaries of larger parent companies; for example, Cleanaway is a subsidiary of Brambles Industries. The full list of companies used in this analysis is included in Appendix 1. Affiliation with a stronger or weaker parent company is likely to affect the financial position, and, hence, the credit rating of a subsidiary (and vice versa). While there is no straightforward way of linking the credit rating of a subsidiary with that of its parent company, evidence indicates that a subsidiary of a parent company with a low credit rating would have a lower credit rating than if it were owned by a company with a high credit rating.[10] Similarly, if a subsidiary's parent company has a high credit rating, it may have a higher credit rating than if it were an independent company. For this reason, the analysis considers the financial positions of UK-based private waste management companies *and* of their parent companies.

To put into perspective the financial position of UK-based private waste management companies, the analysis considers a set of key financial ratios that are used by ratings analysts when assessing financial performance. They relate to profitability and interest cover, cash-flow adequacy and capital structure. Table 3.5 shows some of the key financial ratios considered by Standard & Poor's (S&P), and reports the median ratios observed for a sample of rated US industrial companies with different credit ratings. Definitions of the financial ratios are provided in Appendix 1.

[10] Standard & Poor's (2002), 'Corporate Ratings Criteria'.

Table 3.5: Medians of key financial ratios by credit rating, S&P industrial companies, 1998–2000

	AA	A	BBB	BB	B
EBIT interest coverage	10.1	6.1	3.7	2.1	0.8
EBITDA interest coverage	12.9	9.1	5.8	3.4	1.8
Funds from operations/total debt (%)	55.4	43.0	30.8	18.8	7.8
Return on capital (%)	21.7	19.4	13.6	11.6	6.6
Operating income/sales (%)	22.1	18.6	15.4	15.9	11.9
Long-term debt/capital (%)	28.2	33.9	42.5	57.2	69.7
Total debt/capital (%)	37.7	42.5	48.2	62.6	74.8

Note: EBIT, earnings before interest and tax; EBITDA, earnings before interest, tax, depreciation and amortisation.
Source: S&P (2002), 'Corporate Ratings Criteria'.

These median ratios are not intended to be benchmarks to achieve a specific rating— when assigning a rating, the rating agencies consider a range of factors in addition to financial performance. Nevertheless, the ratios can help determine the general credit quality of companies once their business profiles have been analysed. The median financial indicators are therefore a useful point of comparison for evaluating the financial position of the waste management companies and their parents.

Table 3.6 shows the median values of the key financial ratios of the main waste management companies in the UK, alongside those of their parent companies. The reported ratios are calculated using company accounts data between 2000 and 2002.[11]

An indicative credit rating corresponding to each ratio is also shown, on the basis of the averages reported in Table 3.4. Note, however, that the assigned rating is indicative only. The rating is prone to a margin of error—it is based on the median ratios calculated by S&P for the sample of US companies; moreover, as indicated above, the process of assigning ratings is not as straightforward as the process used here.

Table 3.6: Medians of key financial ratios of eight UK waste management companies and their parent companies, 2001–02

	Waste management companies	Parent companies	Indicative rating of waste management companies
EBIT interest coverage	2.2	2.5	BB
EBITDA interest coverage	5.3	4.5	BBB
Funds from operations/total debt (%)	29.2	18.7	BBB
Return on capital (%)	10.5	8.9	BB
Operating income/sales (%)	18.2	21.9	A
Long-term debt/capital (%)	36.7	46.4	BBB/A
Total debt/capital (%)	64.9	49.5	BB/B

Note: The companies selected are among those with the largest market shares.
Source: OXERA calculations, based on accounting data from Companies House and Thomson Datastream.

The data indicates that the credit rating of the waste management industry as a whole would be borderline investment grade. According to S&P, debt rated 'BBB' exhibits adequate protection mechanisms, but adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the company to meet its financial commitment on the obligation. This risk will be reflected in the premium the company has to pay to raise debt in the market, or will reduce its ability to raise funds.

[11] For the waste management companies, the calculations are based on the latest annual financial statements available from Companies House. For the parent companies, the data was downloaded from Thomson Datastream.

However, at least half of the parent companies of the waste management companies analysed have been rated by S&P and assigned investment-grade credit ratings. As discussed above, this could allow the subsidiaries to acquire finance on cheaper terms. The use of a median as an indicator of the financial position of the UK private waste management industry, as in Table 3.6, does not take into account variations between firms in the industry. Hence, while the strongest companies may be able to undertake capital investment in waste management infrastructure relatively cheaply, weaker firms may struggle to raise capital.

3.4 Conclusion

The financing of waste management involves a number of challenges. First, although the EPCS block—the traditional source of funding for municipal waste management—was increased significantly in 2002, there is no guarantee that the growth in the EPCS block will keep pace with the costs of waste disposal and collection. The formula used to determine the EPCS block does not take into account the specific regulatory factors that are driving increases in the cost of waste management.

Second, other sources of finance—such as the PFI, Waste Minimisation and Recycling Fund, and Waste Management Performance Fund—are likely to make a significant contribution to the financing of waste management. There is evidence that the cost of PFIs could be reduced by mitigating regulatory risk, especially where local authorities pass on regulatory risk to the contractor. There is little evidence on whether regulatory risk is, or is not, being apportioned appropriately in waste PFI contracts.

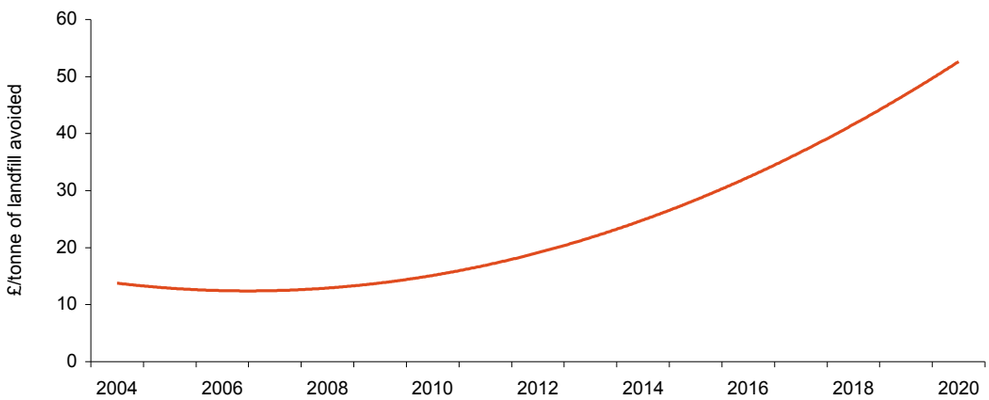
4. The Role of Landfill Tax

4.1 Cost–benefit analysis of the waste strategy

The primary purpose of the government's waste policy is to divert waste away from landfill to recovery. The additional cost of diversion per tonne of waste in the scenario presented in section 2 is about £15/tonne on average over the next ten years (see Figure 4.1). This can be compared with estimates of the environmental cost of landfill avoided by diversion: £2/tonne for disamenity alone by Cambridge Econometrics in 2003, and of £2–£4/tonne by CSERGE in 1993.[12] Hence the costs of diversion outweigh the environmental benefits, and, in the public interest, the government's targets should not go beyond those mandated in European law. The 2005 targets do go beyond European targets, in that they bring forward to 2005 a disproportionate amount of the 2010 Landfill Directive target, and they do not pass a cost–benefit test—the cost of diversion, £15/t, is greater than the benefit, £2–£4/tonne.

Figure 4.1 shows the rising cost of diverting an additional tonne of waste away from landfill over time as the cheaper diversion options are used up, based on the scenario described in section 2. The cost of diversion is £10–£15/tonne until 2010, and rises steadily to about £50/tonne in 2020. The figure has been calculated by comparing the waste diversion scenario developed for this report with an alternative, 'do nothing', scenario, in which no additional diversion away from landfill takes place. In each year that the former scenario diverts more waste away from landfill, the amount diverted (in tonnes) is compared with the rise in the costs of waste management, and expressed in units of £/tonne. This unit cost rises over time, and Figure 4.1 shows its path, smoothed over time.

Figure 4.1: Marginal cost of diverting waste from landfill



Source: OXERA calculations.

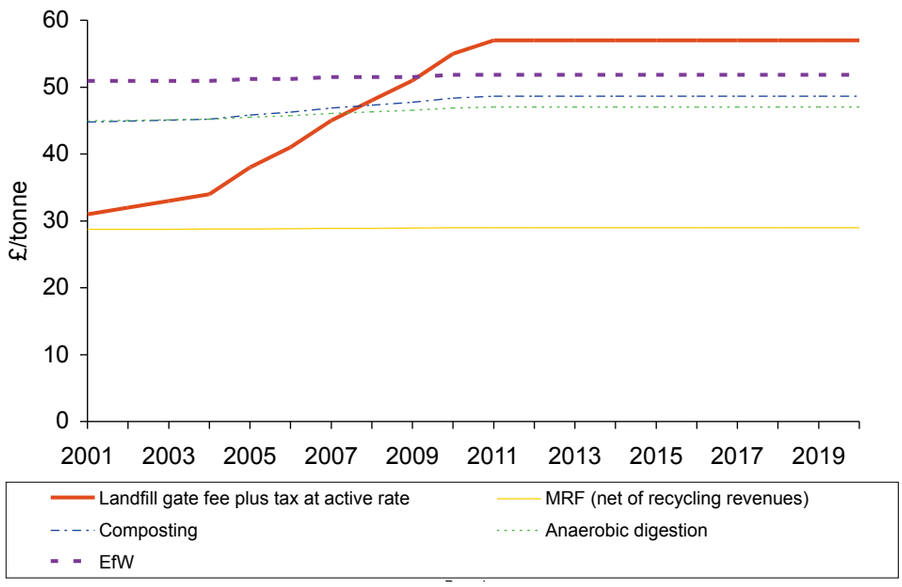
4.2 Use of waste policy instruments

The BMW trading scheme is expected to deliver compliance with the Landfill Directive diversion target for 2010.

The present landfill tax rate escalator is set to rise to £30–£35/tonne by the end of the decade. This is sufficient to promote switching of MSW from landfill to recycling, composting and EfW, as shown in Figure 4.2. It would deliver the BMW diversion target, and negate the benefits of the trading scheme to be introduced under the Waste and Emissions Trading Act 2003. With the trading scheme in place, the case for raising the landfill tax to £35/tonne is substantially undermined.

[12] Cambridge Econometrics, EFTEC, WRc (2003), 'A Study to Estimate the Disamenity Costs of Landfill in Great Britian', Defra, February. CSERGE, Warren Spring Laboratory & EFTEC (1993), 'Externalities from Landfill and Incineration', London:HMSO.

Figure 4.2: Kerbside-collected household waste disposal and treatment unit costs

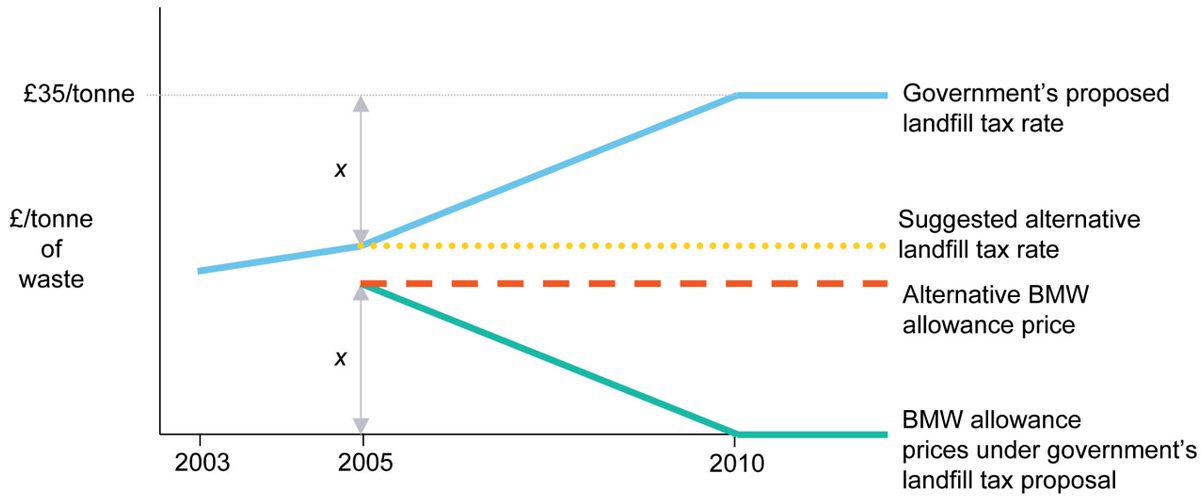


Source: OXERA calculations.

Thus, with the local authority waste trading system in place, the primary purpose of the landfill tax should be to control landfilling of industrial and commercial waste. There is strong evidence from high current levels of industrial and commercial waste recycling that a landfill tax of perhaps £20/tonne or less might be sufficient to achieve the industrial and commercial waste diversion targets. Hence, a landfill tax rate increase to £20/tonne or less, instead of £35/tonne, would be sufficient to achieve the tax's primary purpose. Municipal waste could then either be exempt from the landfill tax, or continue to be charged. However, if the government pursues its policy of raising the tax rate to £35/tonne, it is likely that the BMW allowance prices will start at a high level, only to collapse to zero within a few years.

If the level of landfill tax proposed for 2005 is sufficient to deliver the industrial and commercial waste diversion target for 2005 (and given that there is no increase in the target thereafter), the landfill tax could be stabilised at the 2005 level. This situation is shown in Figure 4.3. In conclusion, there appears to be a case for stopping the landfill tax escalator of £3/tonne as early as 2005, and to abandon the policy to raise it to £35/tonne.

Figure 4.3: Landfill tax stabilised in 2005 and BMW allowance price profile



Appendix: Analysis of Financial Position of Companies in the Waste Management Sector

A1.1 List of waste management companies and their parent companies

Waste management company	Parent company	Ownership (%)	Parent credit rating (S&P)
Biffa	Severn Trent	100	A+
Onyx	Veolia Environnement	100	BBB+
WRG	Terra Firma Capital Partners	46	A
Cleanaway	Brambles Industries	100	n/a
Cory	Exel plc	100	n/a
Focsa	FCC	100	n/a
SITA	Suez SA	100	A–
Viridor	Pennon Group	100	n/a

Source: Companies' annual reports; and S&P.

A1.2 Definitions of financial ratios used

The financial ratios were calculated as follows.

1. EBIT interest coverage

Numerator: EBIT (earnings before interest and tax)
Denominator: Gross interest charge

This ratio indicates how many times interest charges could be paid out of gross operating profit.

2. EBITDA interest coverage

Numerator: EBITDA (earnings before interest, tax, depreciation and amortisation)
Denominator: gross interest charge

3. Funds from operations/total debt

Numerator: net income from continuing operations plus depreciation and amortisation
Denominator: total debt

4. Return on assets

Numerator: EBIT
Denominator: shareholders' equity + total debt

5. Return on sales

Numerator: EBITDA
Denominator: Total sales

6. Gearing (long-term debt)

Numerator: long-term borrowings
Denominator: long-term debt + shareholders' equity

7. Gearing (total debt)

Numerator: total debt
Denominator: total debt + shareholders' equity

8. Gearing (short-term debt)

Numerator: short-term borrowings
Denominator: total debt + shareholders' equity

Ratios 1–3 concentrate on liquidity, and provide information about a company's ability to create sufficient cash flow to meet the fixed-interest payments on their debt. Low coverage ratios indicate a higher-probability debt default.

Ratios 4 and 5 are profitability ratios, and provide information about a company's operating efficiency—ie, its ability to produce earnings from its invested capital, and from its total sales. Companies with high operating profitability have greater ability to generate equity internally and acquire external funding. The earnings-generating power is also an important determinant of the value of a company's assets.

Ratios 6–8 are debt ratios, which indicate the amount of debt a company holds relative to equity. This asset mix is a critical determinant of the riskiness of the financing of a company's assets. Large interest payments resulting from aggressive debt financing increase the probability of default for a given business risk, and may compromise otherwise strong operating performance.

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