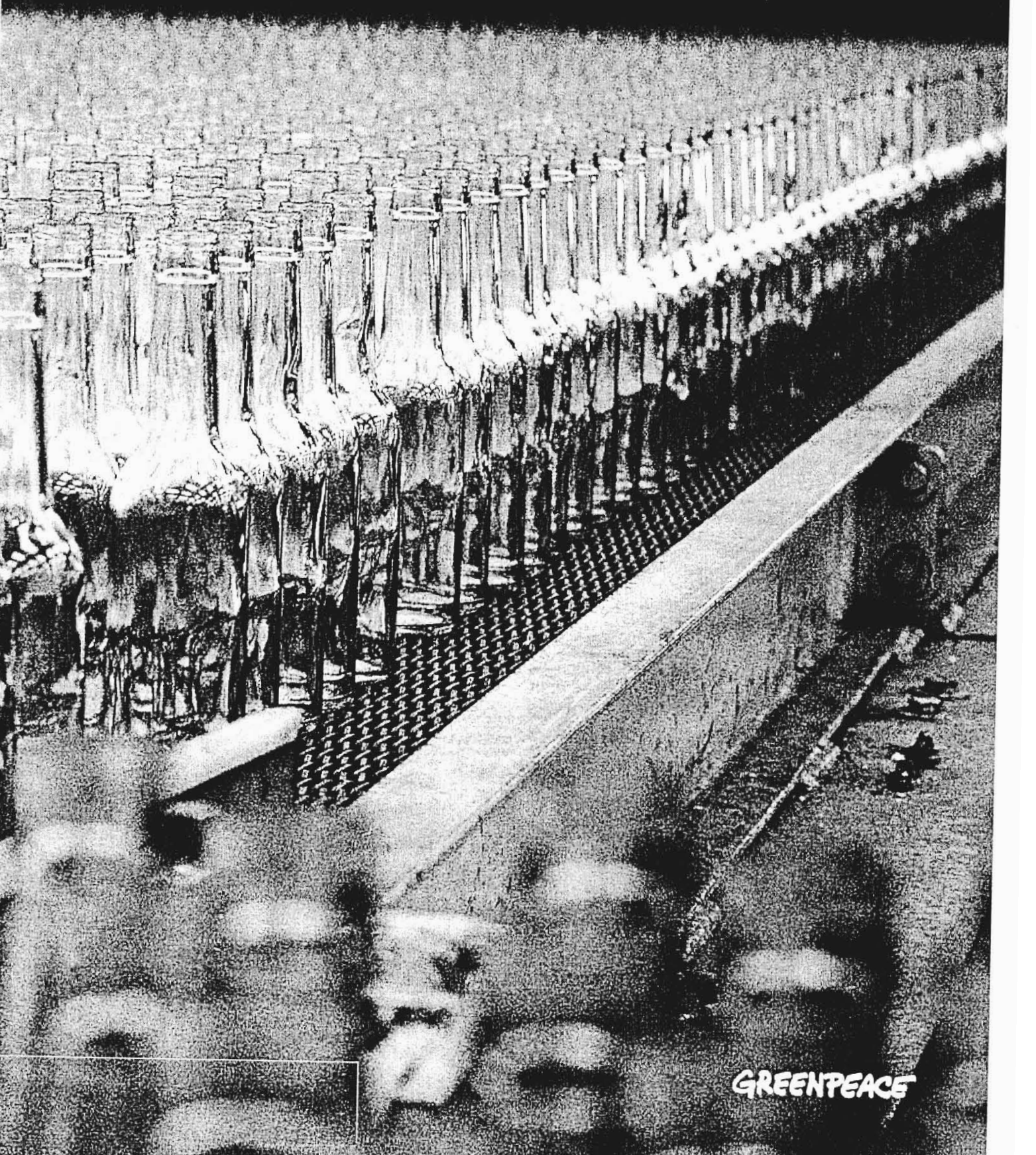


Zero Waste

abridged



GREENPEACE

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Introduction

The issue of waste has become a political hot potato. Central government wants 'sustainable waste management' but passes the buck to local authorities. Local authorities decry the lack of funds from central government to enable anything but the cheapest option and reproach householders for failing to participate in reduction and recycling schemes. And the public opposes waste disposal facilities – both incinerators and landfills – with the same vehemence they normally reserve for nuclear waste dumps.

Waste has moved from the margins of debate to the political mainstream. The prime mover has been a new awareness of the impacts waste disposal has on communities and the recognition that the problem is spiralling out of control. But despite the new awareness that our society faces a waste crisis there is also a far greater willingness to see waste as an opportunity, and to see the solutions as part of a wider agenda stretching from climate change through resource management to urban regeneration.

From the perspective of pollution, the problem is a question of what waste is. From the perspective of resource productivity, it is a question of what waste could be. As a pollutant, waste demands controls. As an embodiment of accumulated energy and materials it invites an alternative. The one is a constraint to an old way of doing things. The other opens up a path to the new.

The integrated waste management option

The race is now on to draw up 'sustainable' waste strategies. But the failure of central government, and most waste disposal authorities, to make any serious progress with the 'reduce, re-use, recycle' paradigm during the last decade has led to a national policy that encourages strategies that are anything but sustainable.

This policy and the local strategies based on it are referred to as 'integrated waste management'. Based on a simple forecasting model that predicts a maximum recycling level of around 40% and a continued increase in municipal waste generation, the 'integrated option' relies on incinerators, or other forms of thermal treatment, to deal with the large predicted residual waste stream.

Whatever the wording of 'Waste Strategy 2000', which nominally gives primacy to waste minimization, recycling and composting, the central thrust of government policy has been to solve the 'disposal problem' through incinerator-led packages. These packages offer some increase in recycling but they fall far short of what is required. Pollution is generated and dispersed to air and land while the majority of recyclable material is lost to disposal along with most of the energy contained within it. Opportunities for jobs and community participation are likewise by-passed.

Incinerators lock us into an eternal present of waste generation and disposal. The capital investment they embody and their relentless hunger for feedstock places a very real cap on minimization, re-use and recycling of waste for at least a generation. 'Integrated' waste management precludes the radical new approach to waste that is urgently needed. Incinerators provide an easy option for waste that stifles innovation, imagination and incentives. They effectively kill off the possibility of transforming waste management from its current obsession with cheap disposal to the genuinely worthwhile goal of high added-value resource utilization.

Fortunately there is a way out of this cul-de-sac.

Zero Waste

The first and most obvious question from the casual observer confronted by the concept of 'Zero Waste' is 'Can it be achieved?'. The answer, of course, is maybe, maybe not. But it is not actually the right question to be asking – at least not until we are a lot closer to achieving it than we are right now. The most important role of Zero Waste is as a policy driver that can free us from the disposal cul-de-sac and break through the currently perceived limits to minimization and recycling.

The term 'Zero Waste' has its origins in the highly successful Japanese industrial concept of total quality management (TQM). It follows from concepts such as 'zero defects' that have generated such astonishing results in driving improvements in production technologies in Japan. Transferred to the arena of municipal waste, Zero Waste forces attention onto the whole lifecycle of products. It encompasses eco-design, waste reduction, re-use and recycling within a single framework. It breaks away from the inflexibility of incinerator-centred systems and offers a new policy framework capable of transforming current linear production/disposal systems into 'smart' (intelligent, flexible) systems that utilize the resources in municipal waste and generate jobs and wealth for local economies.

The following pages are extracted from a forthcoming book, entitled simply 'Zero Waste'. It has been commissioned by Greenpeace from Robin Murray, one of the world's leading thinkers on waste issues.

The first chapter details 'the integrated option' and the profound environmental, practical and economic problems inherent in that approach. The second chapter outlines the political, financial and organizational changes necessary to move Britain to the forefront of modern 'smart' waste management. As such, it provides a beacon for politicians wishing to

move the UK from the dark ages of waste disposal to a new era of Zero Waste.

1. The Integrated option

For municipal waste the political 'crisis of transition' has come later in Britain than it has in much of Europe and North America. Until the late 1990s waste was not a national political issue. Britain's geology and widespread mineral production meant a continual replenishment of landfill space. When incinerator capacity contracted in the mid-1990s, landfill was available to take up the slack. There was some local opposition to new landfills, but these were fragmented and lacked a national presence. The environmental movement focussed on other issues such as road building and food, and was in any case weakly represented in formal politics because of the first past the post voting system.

There was, as a result, no strong intercal pressure for British waste policy to engage with the new resource economy. While other EU countries have been transforming waste into secondary materials at a level unmatched since the Second World War, Britain remains stuck in the bottom four of the EU municipal recycling league and is in danger of missing out on the economic potential of 'closed loop industrialization'.

In 1990 the UK household recycling rate was an estimated 2.5%. In line with the turn towards recycling, the Government set a target rate of 25% by 2000. By the time of the next White Paper in December 1995 ('Making Waste Work') the rate was estimated at 5%. The White Paper was still confident, however, that the 25% target could be achieved by 2000 and set a range of other targets for particular materials.

The results are now in for the target year 2000. Household recycling has risen to 10%, still at the foothills of the S curve, and less than a quarter of the rates of leading continental countries. Only Portugal, Greece and Ireland in the EU have lower figures than the UK. If Britain were an American state, it

would find itself third from bottom of the interstate league recycling table. If it were a Canadian province, it would hold the wooden spoon.

As the result of the failure to expand recycling, an alternative policy emerged, which has come to govern both central government policy and that of the great majority of waste disposal authorities in the UK. It now stands blocking the path of intensive recycling, and is the focus of increasingly bitter dispute throughout England, Wales and Northern Ireland.

The policy is similar to those advanced in the face of perceived landfill shortages in the USA and Germany in the late 1980s. Its centrepiece is the construction of a new generation of incinerators. Estimates of the numbers required vary. The Environment Agency's regional waste plans forecast the need for capacity of 18 million tonnes annually, an eightfold increase on current incinerator capacity of 2.3 million tonnes. This is equal to 60 plants of 300,000 tonnes each, or 90 plants of 200,000 tonnes. The model drawn up for the government's Waste Strategy estimated that between 94 and 121 new incinerators of 250,000 tonne capacities would be needed if municipal waste continued to grow at 3%, compared to the 132 estimated in the Landfill Directive RIA model, assuming the same rate of growth and plant capacity.¹

The forecast numbers vary with the assumed rate of growth, but since incinerators have a lead time of seven to eight years, the municipal waste plans and contracts now being put in place usually assume a 3% rate of growth in their forecasting (in line with municipal waste arising over the past five years) and estimate the size and number of incinerators accordingly.

Given current government planning guidance and the requirements for diversion from

¹ The Environment Agency estimates are contained in their nine regional strategies published in 2001. The results of the waste strategy model and a summary of the Landfill Directive RIA model results are contained in annex B of *A Way with Waste*, DETR, 1999, volume 2 pp 148-160.

landfill, there are few disposal authorities that have not included incineration or some other form of thermal treatment in their long-term waste plans. It suggests that the range of 94-121 given in the Waste Strategy model is the likely outcome in terms of present planning and contract strategies. What this amounts to is a proposal to build incineration capacity of between 27 and 33 million tonnes per annum, sufficient to take all municipal waste currently produced.

The current evidence from waste disposal authorities and their unitary counterparts throughout the country is that at a time when a new regulatory framework for minimizing waste is being put in place in Europe, and when incineration as an industry is stagnating internationally, Britain is set to embark on the largest new incinerator building programme in the world. Investment costs for a programme of this size are estimated at £8 billion. The waste contracts attached to them have a forecast value of £50 billion. In pursuing this path, Britain now finds itself running against the political, regulatory and industrial tide.

The current focus on incineration is the other side of the failure to develop recycling in the UK. Faced with the targets of the Landfill Directive, neither the government, nor the disposal authorities nor the major waste industry see that it is possible to meet the targets with recycling alone. Each present a similar picture: a graph showing the past five years trend line in municipal waste extending to 2020; a second line describing the landfill diversion targets over the same period and a third one showing the maximum likely level of recycling. Between the assumed level of recycling and the targeted levels of diversion is a gap, one that it is suggested can only be filled by incineration or a similar form of capital intensive treatment.

This simple model of forecasting is now driving waste strategy at every level in Britain. It has come to be known as the 30:50:40

model, with recycling usually accounting for 30%-35% of total waste arisings (40% in the more ambitious schemes), processing for 40-60%, and landfill for 30%-50%, the totals adding to plus or minus 120% because of the need to process and then landfill part of the residual waste.

The strategies based on this model are referred to as 'the integrated option'. They comprise the three elements of the forecasting model:

- low-road recycling, in the form of mixed waste recycling, bring banks and supplementary multi-material kerbside collections;
- an expansion of some form of mixed waste treatment (principally incineration, supplemented by other types of thermal treatment, and/or anaerobic digestion);
- continued landfill, since all these treatment methods have substantial residues that for the most part are unacceptable as recyclate (incinerators have a bypass of incombustible waste plus ash that amounts to 45% of the waste tonnage for treatment; mixed waste composting produces a low quality output which at the moment is not permitted even as landfill cover).²

The standard arrangement is for all three to be combined in a single municipal contract running for 20-25 years. To guard against possible shortfalls in the supply of waste for the incinerator, they are required to include minimum tonnage contracts and a guaranteed gate fee, on the basis of which the contractor can raise finance for the construction of the incinerator. Contracts of this kind effectively protect the financiers and operators of the facilities from the dangers of waste diversion, and from competitors for waste. Where this has not taken place, as in a number of the US states, in Germany and in Switzerland, incinerators have found themselves short of

² *Manchester Waste Limited and the Manchester Waste Disposal Authority have been in dispute with the Environment Agency over the classification of the organic output from their mechanical and biological treatment plant, which at the moment is classed as non inert waste and subject to the landfill tax. See the House of Commons Select Committee Report, Environment, Transport and Regional Affairs Committee, Delivering Sustainable Waste Management, Minutes of Evidence, 14th March 2001, p.62*

waste and have had to import waste or, in some cases, to close down.

The timing and length of the contracts are determined by the incineration component, as are the companies who bid for them. Only the large old-order waste firms are in a position to bid for and operate a contract of this size. To date this has meant that the recycling and composting components are provided as large-scale facilities established to meet the targeted requirements of the contract.³

The attraction of these arrangements for the existing order should be immediately clear. The priority given to disposal, to fixed investment, and to technologies for mixed waste treatment all fit within the existing organizational and technical paradigm. In this sense they appear to be a more reliable option than recycling. Combined in a single package, they are easier for a disposal authority to administer than multiple 'unbundled' contracts, they are more straightforward to finance, and they confirm the disposal authority as the dominant institution in the management of waste.

There are, however, profound environmental problems with this option:

- waste is still viewed as 'end of pipe' and managed from the vantage point of the terminus of linear production. In spite of the new language of resource recovery and waste minimization, the driving problematic of the industry remains disposal;
- the mass production paradigm which governs the industry cannot cope with the complexity of the processes required to achieve high material and energy productivity;
- thermal treatment, by whatever method, remains problematic because of the fluctuations in feedstock and the control of hazardous emissions to air, water and

land that are produced:

- the traditional model of environmental regulation, which is designed to reduce the hazards of waste disposal, is itself limited, reflecting as it does the old paradigm of production that it is seeking to control.

These limitations leave the strategy open to criticism on all three of the main environmental criteria. Pollution problems are not eliminated. The majority of recyclable material is still lost to disposal, as is the grey energy contained within it.

The integrated option is a way of preserving a modified 'business as usual' at substantially higher cost. It represents a major environmental opportunity foregone.

There are also a number of practical problems:

- incinerators are unpopular. The strength of anti-incinerator feeling and its political consequences is one of the main reasons why the building of incinerators has virtually stopped in English-speaking countries and why previous national programmes to use incinerators to fill the gap between expected waste growth and recycling have had to be abandoned. As the waste industry acknowledges, only one new incinerator has been built in the UK in the past ten years;
- the current and future Directives extending producer responsibility and promoting recycling and composting threaten the size of the residual waste stream. By 2010 the achievement of the proposed level of recycling for packaging, increased recycling of newsprint and the separate collection of organics as set out in the draft for the Bio Waste Directive are likely to cut the residual waste stream by 50%.

³ *The collection authorities are bound to deliver their waste to such facilities under the terms of the Environmental Protection Act 1990 which gives disposal authorities first claim on any waste or recycle in their area.*

irrespective of other methods of reduction. The risks entailed are borne by the disposal authority;

- the costs associated with other fiscal and regulatory changes also fall to the disposal authority, as the cost of incinerator upgrades have done in the past. Possible changes of this kind include: further upgrading of emissions control; the reclassification of incinerator fly ash as hazardous and bottom ash as special waste; further increases in the landfill tax; the introduction of a tax on incinerators as part of a more general disposal tax; the declassification of pyrolysis and gasification plants as sources of renewable energy; and increased costs to the operator of more rigorous enforcement, including the introduction of continuous monitoring and compulsory public liability insurance for incinerator operators;
- single contracts over 20-25 years bind an authority in to a waste company which may be competent at managing an incinerator, but is not an effective operator of recycling and composting plants. The contracts present a long-term barrier against the adoption of current best practice in recycling and composting technology, where it is not in the interests or the capacity of the contractor to adopt it.

The costs entailed in these risks and rigidities fall outside the gate fee settled in the initial stages of the contract. If they were factored in, for example through mandatory insurance, then the thermal treatment options would be likely to become prohibitively expensive.

From the viewpoint of Zero Waste, the primary drawback of the integrated option is that it places a cap on the expansion of recycling. This is not just a formal cap, based on the percentage of waste guaranteed to the incinerator. Nor is it just a question of a

conflict over materials – although an incinerator will seek to preserve recyclable paper and plastic that raise the thermal value of the combustible waste stream.⁴ The real issue is that long-term ‘integrated’ contracts centred on an incinerator preclude the development of the new approach to recycling and clean production that is the subject of this report. Incineration and Zero Waste represent two alternative paradigms that are in continuous tension.

The principal case for the integrated option is that high levels of recycling are impossible. Even were levels of 60% to be achieved this would still leave 40% of the waste as residual, which would need some form of treatment, not least to meet the EU targets. Depending on the assumed rate of waste growth, the required incinerator capacity could be assessed and the size restricted in the contract. This is the core argument. Other parts of the case – about the composition of municipal waste, the assessment of overseas experience, and the likely rates of waste growth – follow from that.

As presented to planning inquiries, citizens’ juries, parliamentary debates and Select Committees, the integrated option has raised other, wider issues, such as the relative costs and safety of incineration compared to intensive recycling, and its relative environmental value. Table 7 summarizes the arguments presented for the integrated option and those advanced for intensive recycling.

In the end, however, it is not an issue of costs, or environmental and economic benefit. Few people now claim, as many did in the 1990s, that incineration is on a par with recycling in the waste hierarchy. Those arguing for the integrated option can readily agree that recycling and composting are environmentally preferable to incineration, that they create more jobs, that they cost less in the long run and that they are more popular and create space for citizen involvement.

⁴ *That this conflict is a real one is shown not just by the low recycling rates of UK authorities served by incinerators but also by the recycling programmes in countries like Holland and Denmark which have had to fit in with the volumes and priority materials required by each country’s stock of incinerators.*

For the advocates of incineration these points are not relevant, since incineration and recycling are not in competition. As they stress, incineration takes over where recycling stops. The only point at issue is a practical one: namely the maximum level that can be expected for recycling. This defines the point at which the integrated option begins, since it is driven by one overriding question – namely what can be done with the residual.

At the moment there is an impasse on the issue. Those responsible for disposal are incredulous that recycling rates of 40% let alone 60% can be achieved in the UK. Consultants' reports have been commissioned to examine the robustness of claims to high recycling, and to identify supposed reasons why they are not applicable here. The excuses are varied: one high performer has user pay (many US states). Another has large suburban gardens (Canberra). A third is small town/rural and not comparable to large urban areas (Quinte). A fourth includes large quantities of commercial waste in its municipal totals and the results cannot be compared. A fifth may be a city but it is Canadian or German and the culture is different from that in Britain.

These inquiries are defensive. They are not intended to learn from best practice in order to adapt it here at home. Their aim is rather to establish a limit to recycling (whether 40% or 70% of the waste stream is in a sense immaterial), so that a planning space is defined in which disposal options can be pursued in isolation as before. The maximum recycling rate forms a frontier between two separate economies, which are not operationally integrated at all.

Behind the studies of recycling rates, waste growth and landfill capacity, lies a quest for certainty – the certainty needed for planning long life, capital-intensive, inflexible facilities. But if one thing is clear from all the discussions of the last five years, it is that so little is certain.

This report has already touched on some of the uncertainties with respect to technology and regulation. There is, too, uncertainty over waste growth, over its future composition, over the changing nature of materials, over the extent and impact of producer responsibility, and of the hazards associated with different forms of waste treatment. We do not know where the corporate attention to Zero Waste will lead, or the shift to biodegradable packaging, or to home delivery and take-back, any more than the Germans could have predicted in 1990 that their packaging waste would fall by 36% in six years and that their incinerators would be starved of waste.

Equally, there are uncertainties about recycling and composting. It may be that the systems of Canberra, or San Francisco or the Milan region cannot be transferred to Oldham and Tower Hamlets. On the other hand, Tower Hamlets, with 70% of its residents living in high-rise blocks, may find a method of recycling like that of Hounslow, which will be more effective and cheaper than any low-rise alternative.

The likely shape of the next twenty years cannot be settled now. The question is how to proceed amidst such uncertainty, particularly where the environmental stakes are so high. There are two key words: flexibility and timing. Flexibility has been post-Fordism's answer to uncertainty. If the future is unpredictable, then concentrate on mobility and keeping options open. Investment in large capital-intensive treatment plants runs right against the trends in the modern knowledge economy of keeping fixed assets flexible and investing in information- and knowledge-based service capacity.⁵

At the very moment of the most rapid change in the nature and use of materials, the incinerator programme threatens to freeze the future for a generation. Large thermal plants are a mid-twentieth century response to a

⁵ For a statement of this position see J Rifkin, *The Age of Access*, Penguin 2000

twenty-first century circumstance. As such, they risk being stranded by change.

Those whose responsibility is primarily residual waste should cease investing in models that predict the maximum level of recycling, but focus on core elements of the disposal strategy proposed earlier:

- move from mixed waste collection to source separation
- maximize short-term diversion through a four stream system to economize on existing disposal capacity
- give priority to the diversion and treatment of hazardous, organic and other biodegradable waste in order to neutralize the residual for landfill
- employ small scale, flexible plant for pre-treatment (such as the modular mechanical-biological treatment plants which can be converted to specialized in-vessel compost facilities as the residual is reduced)

A policy of this kind was followed by the city of Halifax, Nova Scotia. The citizens rejected both mixed waste landfills and incinerators, backed intensive recycling and insisted that all residuals be pre-treated by mechanical and biological treatment before being landfilled. The result was 60% diversion within six years, and equally important, the opportunity to increase that level over the next twenty years without the constraint of minimum residual tonnage guarantees.

The Halifax scheme, it should be noted, was 'integrated' but it was a different type of integration from the formal integration in a single contract being put in place by disposal authorities in the UK. The Halifax integration is operational, diversion being designed to minimize the hazards of disposal, and the means of disposal being chosen to fit in with

the changing course of diversion. The immediate contrast is therefore not between a single form of waste management (recycling) and an 'integrated' package, but between flexible and inflexible integration – or more usually flexible integration versus inflexible fragmentation.

Flexibility is also linked to timing. Incinerators and large-scale capital projects take seven to eight years to bring on-stream. A four stream recycling system can be in place within a year. The current pressure on local authorities to conclude incinerator-based disposal contracts is such that, given long lead times, early decisions have to be made to meet landfill targets ten to fifteen years ahead. The mammoth of the future comes back to block the present.

Disposal authorities and the national governments of England, Wales, Scotland and Northern Ireland should follow a different timetable. They should focus all energies on establishing four stream systems, declaring a moratorium on long-term disposal contracts for five years. By the review year of 2006/7 the pre-treatment gap between achieved diversion and the 2010 targets can be better judged and filled with short lead time facilities, and the same goes for the 2015 targets.

Government policy and inflexible integration

The implicit government policy that emerged during the 1990s was to support 'the integrated option'. Whatever the wording of the White Papers giving primacy to waste minimization, the central thrust of policy, finance and planning was to solve the disposal problem through incinerator-led packages.

Incineration faced three practical issues if it was to take its place at the centre of such packages: these related to its environmental credentials; its expense relative to landfill; and the difficulties of getting planning permission because of its unpopularity. The UK Government devoted more time to addressing these questions during this period than it did to promoting recycling.

(i) policy

The arguments advanced in favour of incineration have followed those summarized in the first column of Table 7:

- modern incinerators are safe;
- they make a significant contribution to the reduction of CO₂ through energy recovery, and even more so when they supply district heating. In relation to energy and the Kyoto targets it is EfW rather than recycling that has been emphasized. The saving of energy from replacing primary with secondary materials from recycling was omitted from the principal study undertaken for the DETR on the significance of waste policy for climate change;⁶
- incinerators may be environmentally and economically preferable in certain circumstances. In the words of the 1995 White Paper, EfW 'will increasingly represent the best practicable environmental option (BPEO) for many

wastes. This will especially be the case where final disposal becomes more limited and in situations where the environmental and economic costs (including collection and transport) of recycling are high and where the practical optimum for materials recovery has been reached.'⁷

For this argument to hold, much depended on life cycle analysis as applied to particular materials, waste management methods and places. The second half of the 1990s thus saw an increasing use of these tools to determine the BPEO, largely using static LCAs, and culminating in the Environment Agency's WISARD, a model that disposal authorities were required to use to determine the optimum mix of methods.

On the basis of these three arguments, local authorities were encouraged to include EfW in their disposal plans and to consider the need for long-term disposal contracts as a condition for financing the large-scale investment required.

All three arguments are now in question. The revelations about the operating conditions at the Byker and Edmonton incinerators, of the exceedances and the practices of ash disposal, have raised major questions about the safety of 'actually existing incinerators'. These concerns have been compounded by the fire and closure at the Dundee incinerator and the Wolverhampton plant, and by the problems of NO_x exceedances at the Coventry and Sheffield plants. The precautionary principle now hangs like a cloud over the safety claims about modern incinerators as they actually operate.

Secondly, the US EPA 1998 report and the idea of environmental opportunity cost would counsel prudence in arguing for EfW's contribution to CO₂ reduction, relative to recycling and composting.

⁶ *The DTI consultation paper on renewable energy strategy emphasized EfW as a significant potential contributor to the renewables programme (New and Renewable Energy for the 21st Century, DTI March 1999) and the 1999 Waste White Paper took this up, concluding that 'the Government will continue to encourage the recovery of energy from waste, where this is the BPEO, as part of its renewable energy strategy.' A Way with Waste, DETR, 1999 vol 1, p.21. Nevertheless, in terms of climate change strategy, waste was given only marginal importance chiefly because the AEA report estimating the CO₂ savings from recycling omitted all savings energy saved from avoided virgin production. (see footnote 13 above).*

⁷ *Making Waste Work, DETR, 1995, p.53*

Similarly the critique of static LCAs and the controversy surrounding WISARD makes the concept of BPEO a less reliable support for EfW than was once thought.⁸

(ii) finance

The principal practical problem for incineration has been its high cost relative to landfill, an underlying differential that has increased as emissions limits have tightened. The government – through both the former DETR and the DTI – has concentrated on reducing this gap. The increase in the landfill tax assisted in this. But the two ministries have, between them, provided a range of subsidies or decisions on classification that have lowered the costs of incineration.

The subsidy and classification measures have included:

- awards under successive tranches of the NFFO, which for the two London incinerators alone were worth £14 million p.a.;
- exemption of incineration from the proposed Climate Change levy;
- the inclusion of pyrolysis and gasification in the Renewables Obligation;
- the provision of government funds under the Private Finance Initiative;
- the classification of incinerator bottom ash as inert, thus reducing the landfill tax to £2 a tonne;
- the classification of incinerator ash for construction purposes as recycling (ceased 2001) and the promotion of its use as a means of reducing the costs of disposal;
- the classification of energy from waste as recovery rather than disposal. (The EU

Commission argued that it was disposal, on the grounds that the low thermal value of municipal solid waste did not qualify it to be considered as a fuel.) This allowed EfW plants to issue and sell packaging recovery notes for the packaging element of their combusted waste (some 19%);

- the exemption from business rates;
- the provision of normal capital allowances on all forms of fixed investment.

The sums involved, estimated at £1 billion over seven years, dwarfed those provided for recycling.⁹ In cases where there was an opportunity to fund intensive household recycling, through the Landfill Tax compliance scheme or the packaging regulations, local authorities and recycling collection were marginalized.

(iii) planning

The process of obtaining the necessary planning permission and consents has been a significant hurdle for the constructors of incinerators. The government used two main approaches to ease the process:

- it encouraged local authorities to include EfW in their waste local plans. (The Environment Ministry's current planning guidance, PPG 10, specifies that local authorities should make provision for all forms of waste treatment, a clause frequently quoted in planning inquiries in support of incinerator applications);¹⁰
- after pressure from industry, the environmental and health impacts of an incinerator application were assigned to the Environment Agency for approval under the Integrated Pollution Control regulations, a move which left them less open to public scrutiny than the customary planning process.

⁸ There were substantial delays in delivering WISARD, caused, it was said, because its designers had found it difficult to get it to produce results supportive of the 'integrated option'. This was eventually solved, but after less than a year, the Scottish Environmental Protection Agency decided to end its compulsory use on the grounds that it always produced results favouring incineration.

⁹ In the first half of the nineties there was a small Supplementary Credit Approval programme to assist local authority recycling; and later individual awards were made under Capital Challenge and SRB programmes. The total was probably less than a tenth of the amount by which the UK remaining incinerators were subsidized.

¹⁰ In a Parliamentary answer the Minister Michael Meacher said that this was not necessarily the case, but the Guidance continues to carry weight none the less.

Throughout the 1990s there was strong official support for a revival of incineration. In 1993, the Royal Commission on Environmental Pollution advocated the increased use of incineration with energy recovery for the disposal of controlled waste, and the 1995 White Paper endorsed these conclusions.¹¹ The 1999 White Paper, although relegating EfW below recycling for the first time in the waste hierarchy as the result of political pressure, nevertheless stated that EfW, 'will need to play a full and integrated part in the local and regional solutions'.¹² It underlined the importance of the 'integrated approach' and the need to include a mixture of waste management options and 'avoid over-reliance on a single waste management option'.¹³

With the focus on re-establishing incineration, the DETR and the DTI had little time and less money to advance recycling. In using public funds and directives to level the economic playing field between landfill and incineration, it tilted it further away from early stage recycling, relative to incineration. The resulting poor performance of recycling confirmed the view of the limitations of recycling and gave even greater significance to alternative disposal options. In this sense the policy, financial and planning frameworks all combined towards a self-fulfilling recycling pessimism, leading to the current dominant option being that of 'inflexible integration'.

Changes in political climate

Early in 2000, the politics of waste began to change. Until then, local campaigns against incinerators and in favour of recycling had remained local. They received wide coverage in their local press, but scarcely any nationally. In March 2000, the Guardian carried the first coverage of the ash scandal at the Byker incinerator in Newcastle. In May the results of the independent testing of the ash and allotments soils on which the ash had been spread were announced, and filled the national press.

Since then not only the broadsheets, but BBC radio and television have covered waste stories, from alleged corruption in the Landfill Tax Credit scheme and the continuing revelations about Byker and Edmonton ash, to the growing number of anti-incinerator campaigns in Surrey, Sussex, Essex, Kidderminster, Wrexham, Sheffield, Newcastle and Neath Port-Talbot.

At Byker and Neath, protestors chained themselves to the incinerator gates. At Edmonton and Sheffield, Greenpeace occupied the chimneys. A national network was formed in May 2001, bringing together all these groups in Britain and Ireland. In June 2001, Greenpeace was acquitted of charges of criminal damage by a north London jury, on the grounds that its action at Edmonton was justified since it was preventing greater harm to those living near the plant.

The strength of local feeling was reflected politically. In May 2000, the Conservative Party published a waste policy that proposed a five-year moratorium on incineration, kerbside recycling for every home in Britain, and a dense network of compost sites throughout the country. The Liberal Democrats published a similar manifesto at the same time.

From mid-2000 there was a marked change in government policy. It departed from the 'light government' approach in three principal ways:

- compulsory recycling targets for local authorities were announced in the Waste Strategy 2000 in May 2000;
- the first specialized recycling institution was announced in the Strategy, the Waste Resources Action Programme (WRAP), to promote markets for recycle;
- the Spending Review in July 2000 announced direct government support for recycling, reportedly in excess of £500

¹¹ *op.cit* p.58

¹² *A Way with Waste, op.cit. vol 1 p.25 The wording was kept in Waste Strategy 2000, vol 2 p.77*

¹³ *op.cit. vol 2, p.19 Waste Strategy 2000 in re-affirming this point said that EfW plants should be 'appropriately sized' and not crowd out recycling, but no geographical limits were set for the catchment areas so that EfW applications are being considered for areas where their capacity equals the whole MSW stream. See Vol 1, p.23 para 2.23.*

million in the coming three years, supplemented by £50 million for community recycling schemes.

In the areas of targets and finance, there were administrative moves to weaken the support of these measures for recycling. The targets were set much lower than was hoped (25% in 2005, 30% in 2010 and 33% in 2015) in line with the maximum levels officials believed could be achieved, and consistent with '30:50:40' packages being advanced under the integrated option. More strikingly, it was found that DETR officials had classified incineration ash used in road building and construction as recycling, with the result that those authorities with large incinerators rose overnight to the top of the recycling league.

Similarly, when the Spending Review allocations were broken down, it transpired that £220 million was to be allocated to PFI waste projects, all of which to that date had been incinerator-led packages, £140 million was reserved for recycling, and the remainder was part of a package of £1,127 million allocated to local authorities to spend on environmental and cultural services at their discretion. Given the relatively weak position of recycling within the context of local authority budgetary politics, this left collection authority waste officers with few potential earmarked funds on which to base a radical re-orientation of their collection systems, so that an important opportunity for promoting recycling was lost.¹⁴

In spite of these difficulties, the shift in government outlook was marked. WRAP was established rapidly and appointed as its leading adviser the principal US expert on secondary material market creation. The Government has moved to 'de-list' incineration as eligible under the Renewables Obligation (although as a compromise pyrolysis and gasification are still included).

The proposed shift in the EU packaging targets from recovery to recycling signals the end of the PRN subsidy for incinerators. The Parliamentary Select Committee on Waste Policy, reporting in March 2001, urged the Government to adopt the more ambitious recycling targets of 50% by 2010 and 60% by 2015, and re-iterated the call of an earlier Select Committee to impose a tax on incineration as part of a more general disposal tax. The Welsh Assembly in May 2001, as part of its response to the Kyoto targets, agreed a planning 'presumption against' incineration to secure the space for the development of 'recycling and sustainability'.¹⁵

None of this is yet sufficient to slow the momentum behind the incinerator-led plans and contracts being advanced by the disposal authorities. Yet it signals a change in the political climate, which provides the context for immediate measures that would switch Britain's waste economy from its current preoccupation with incineration to intensive recycling and the advance of each of the aspects of Zero Waste.

¹⁴ In September 2000 after Ministerial intervention, it was announced that priority in the allocation of PFI funds should be given to recycling, but the PFI terms and process still favour capital intensive, disposal authority centred projects. As for the £140 million for recycling, there has still been no announcement about how they were to be allocated more than a year after the funds were agreed.

¹⁵ Proceedings of the Welsh Assembly, May 10th 2001, Cardiff.

2. A Zero Waste policy for Britain

The (second term) Labour Government has announced that it will focus on delivery and waste is a sector in which it can tangibly deliver. To do so it will have to radically extend the initiatives of the past eighteen months, and provide leadership both for its civil servants and those involved in the day-to-day management of waste.

Four things are needed:

- clear direction
- transformed incentives
- transitional finance
- specialized institutions

The first two are about expectations and interests. The second two are about finance and knowledge. Immediate, decisive action is needed in all four areas if the redirection of Britain's waste economy is to be achieved by 2006.

Clarification of goals and strategy

The process of environmental transition gives a privileged place to government direction. It indicates to those making the long-term industrial decisions the character of the regulatory and fiscal regime within which they will be operating. It sets the parameters of the future.

Waste Strategy 2000 does not perform this function. Like the White Papers that preceded it, it contains the language of waste minimization, but its substance promotes 'the integrated option'. This is partly due to its absences – to what it does not say about finance and incentives – but it is also because of what it does say.

The key sentences – quoted in council meetings and public inquiries throughout the

country – are those insisting on the 'important role' of incineration. The words aim to present incineration as subsidiary, but in practice it is always dominant. It determines the length and size of contracts, it restricts the field of contractors, it encourages old era technology, and it signals unequivocally that for the next twenty years there will be an irremovable cap on the expansion of recycling. Whether in London or Stockton, in Lerwick or Birmingham, experience shows that the hare of intensive recycling cannot run with the hounds of incineration. Through the gap opened up by these sentences are pouring proposals that place incineration in the lead.

The core message of Waste Strategy 2000 is the 'integrated option'. This is the perspective shaping the long-term strategies of waste companies and disposal authorities. They are having to take on board the household recycling targets, but these are set at levels which leave 70% of municipal waste available for disposal, a volume which is then compounded by assumptions of two decades of annual 3% growth.

If the Government wants waste companies and local authorities to redirect their strategies then it must give an unambiguous statement to that effect, especially as what is being signalled is a change of paradigm. It should be made clear that incineration and complex technologies of mixed waste treatment are not the path to be taken and that the problems which the profession should be confronting are those of high quality composting and up-cycling, not how to control emissions and prevent explosions at thermal treatment plants. The Government needs to indicate that it is looking for a new technological trajectory.

In shifting the vision, it must also explain the reason for doing so – in terms not of EU Directives but of environmental imperatives, that are likely to intensify as time proceeds. These provide the material basis for the change in strategy, a basis that all

governments will have to address whatever their political aesthetic. This, too, requires a change of tone from Waste Strategy 2000.

To the 'comfort words' of sustainability need to be added the urgency of environmental evidence and the promised impact of action. If the public service is to regain the confidence to champion the public interest in the environmental realm, then it must develop an intellectual identity that goes beyond the demands of bureaucratic and utilitarian rationality. Setting out the compelling case for Zero Waste is necessary as much for the internal brio and coherence of government as it is for the investors and green-collar workers on the streets.

What is called for is a new White Paper that does two things:

(a) clarifies the scope and purpose of intensive recycling and the goals of Zero Waste

It should ground the strategy more firmly in the goals of cleaner production, the global reduction of CO₂, increased resource productivity and soil restitution. These become the criteria of conduct, the lodestars for policy and practice.

(b) changes the strategy from intensive incineration to intensive recycling, from 'inflexible fragmentation' to 'flexible integration'

The simplest way to do this is through four measures:

- **convert the current local authority recovery targets of 45% by 2010 and 67% by 2015 into mandatory municipal waste recycling targets**

The dropping of recovery goals and their replacement by demanding recycling targets is the present lead proposal for the revision of

the 2006 Packaging Targets within the EU. Adopting the conversion proposals for household waste in the UK would put Britain's targets broadly in line with the 50/60% proposals of the Select Committee.

- **introduce separate organic collections throughout the UK within five years**

Separate organic collections are proposed in the EU draft for the Bio Waste Directive. Implementing this immediately would shift the UK from the bottom quartile of European recyclers to the upper half alongside regions and countries already collecting organics (the Netherlands, Flanders, some regions of Italy). It would make Britain into a leader, not a follower, of European policy. It would also ensure that most authorities met the 45% targets by 2010, and would provide the platform for reaching the 67% target by 2015.

- **announce a ban on untreated waste and uncomposted organic waste to landfill by 2010**

This is the 'Halifax option', a complementary measure designed to neutralize residual waste going to landfill as a guarantee for those living near landfills and as a further immediate action to reduce methane emissions. A ban of this kind will be introduced in Germany in 2005.

- **introduce a moratorium on all applications for new thermal treatment plants until a review of the strategy in 2007**

Many of the states and regions that have promoted intensive recycling have done so in conjunction with a ban on incineration in order to leave no ambiguity about the required change in direction. A similar clear statement is needed in the UK.

Restructuring incentives

There will be no change in direction, whatever the wording, without a radical restructuring of incentives. The long-term shift to producer responsibility for waste is part of this, and the changes already taking place to minimize waste through process and product innovation in the packaging industry exemplify the point.

The complementary shift to consumer responsibility by introducing user pay would also provide an incentive to residual waste minimization (albeit on a smaller scale). Certainly, overseas experience has often been that introducing user pay helps boost recycling rates. In the UK, this should be a second stage rather than first stage change for two reasons:

- introducing user pay before established, convenient kerbside collections are set up encourages fly-tipping;
- there is already scope for introducing charges and discounts within the terms of current legislation (see Part IV, section 7 above). The inability to charge directly for the collection of residual waste will also encourage innovation by waste collectors in the incentives they offer to householders.

Instead the focus for immediate action should be on changing the incentives to the principal decision takers on waste disposal, the disposal authorities and the waste companies. The first thing that has to be changed is the perverse hierarchy of profitability. If landfill offers the greatest returns (over 15% p.a.) and recycling the least, then it is to be expected that recycling remains the waste industry's Cinderella.

To reverse this there are three issues that need to be kept distinct:

(i) the degree of monopoly

Due to the high weight/low value of waste, disposal facilities enjoy a degree of spatial monopoly. The restriction of planning permissions means that those who own the facilities – whether landfills or incinerators – are able to charge prices that include a locational rent, determined by the costs of transporting waste to a rival facility. The cost of transport tends to be high, both because waste is carried in expensive refuse collection vehicles (or has to switch vehicles at a costly transfer station) and because of the cost of downtime in collection.

One of the reasons waste companies in the USA have not been attracted by source separated recycling is that it is more difficult to earn locational rent. They have rather favoured large centralized facilities and long-term recycling contracts to feed them. The drive for locational rent has also been one of the reasons why owners of landfills often under-report capacity, and why disposal companies more generally have an interest in underestimating future capacity, and over-estimating waste growth.

To redress this cause of the imbalance between recycling and disposal means either increasing monopoly rents from recycling and composting, or reducing those rents that already or might exist. The latter is the easier and more desirable course. There is a range of possible strategies:

- linking planning permission for facilities to the contractual tender process, with permission reverting at the end of contract. This has the disadvantage that those disposing of non-municipal waste would still be open to the higher charges;
- placing the ownership of landfills and other disposal facilities in the hands of environmental trusts charged with maintaining environmental safety;

- encouraging the development of a distributed network of small facilities as a means of minimizing transport at the same time as increasing spatial competition. This is particularly important for composting and for recycling sorting and bulking facilities.

In the long run, the reduction of waste volumes as a result of high recycling tends to reduce the element of waste rent, as landfills and incinerators lower their gate fees to compete for the remaining residual waste (this has been the experience in Canada, the USA and Germany). From this perspective, intensive recycling based on distributed facilities represents a means to increase competition in the industry and reduce the differential of returns between recycling and disposal.

(ii) relative costs between methods of waste management

There are wide divergences in relative costs per tonne between landfill, incineration and the initial stages of recycling. This is the short run position. In the long run, recycling costs fall, and the costs of residual waste management rise. One reason is the long run trend to tighter environmental controls on disposal, another that lower waste volumes collected by the existing stock of equipment raise unit costs. Three steps are necessary to correct the present imbalance between initial recycling and disposal:

- **the introduction of a graduated disposal tax** with levels reflecting the relative external environmental costs and benefits of each waste option. Studies by the US EPA and Coopers Lybrand for the EU provide a measure of the relative weights to be attached. As a first step, the UK could follow the Danish model, by introducing a further £5 p.a. escalator in landfill tax when the current escalator expires, bringing the level up to £30 a

tonne. On the USEPA and Coopers Lybrand evidence, the tax on incinerators should be set at or near the figure for landfill.

- **ending subsidies and ambiguous classifications designed to lower the costs of incineration** This includes ending the exemption of incinerators from the Climate Change levy, ending PFI awards for large scale incinerator-led contracts, and ending the eligibility of incinerators to issue Producer Recovery Notes;
- **mandatory insurance** for landfills, thermal treatment plants and large composting and recycling facilities as a means of internalizing environmental risk.

(iii) the relative costs and benefits of recycling for waste disposal authorities

Currently, waste disposal authorities (other than unitary authorities) have no interest in the expansion of recycling by collection authorities or community groups because they are required to pay over the disposal savings to the collector in the form of a recycling credit. An urgent task of policy is to restore an incentive to disposal authorities.

There are the following possibilities:

- **The abolition of recycling credits.** This is not recommended since it would end a key source of funds for collection authorities, and also remove a payment that reflects savings in disposal.
- **The replacement of Disposal Authority precepts based on council tax charges by a charge per tonne.** This measure would be aimed at disposal authorities owned by constituent boroughs (such as those in London, Merseyside and Greater Manchester) and would apply 'the polluter pays' principle to the funding of disposal authorities. A change of this kind would

involve one or more of the constituent authorities suffering a loss, which the government should offer to fund on a four-year tapering basis while the losers increase their rate of waste diversion.

- **The bringing together of collection and disposal functions in a unitary Waste Minimization Authority** charged with advancing the government's strategy and achieving the targets within the area concerned.
- **A discount of the landfill tax** should be granted to all disposal authorities as a variant of the Wallonia model (the Wallonia regional government offers zero tax landfilling for a proportion of residual waste). In the UK case, the discount should initially be given for all landfilling of less than 50% of 1995 totals (the 50% level reducing annually by 2%) to provide incentives for disposal authorities to promote recycling, with an automatic rebate being given to all eligible residuals which have been treated through a process of MTB or anaerobic digestion.
- **a rebate of landfill tax should be given to the disposal authorities on tonnages equal to those on which they have paid recycling credits.**

Finance

The lack of finance is the main disincentive to collection authorities expanding composting and recycling schemes. At any committee meeting, waste hearings or public discussion on recycling, both councillors and officers will cite problems of funding and markets (which is another way of talking about finance) as the two reasons why they cannot at the moment proceed further. In local government terms, this is a budget rather than a price disincentive.

The main counterweight has been provided by local pressure expressed through politicians.

As a general rule, an incinerator proposal in any borough or district will increase local resources devoted to recycling. This may be enough to encourage some pioneers: it is not adequate to fund a countrywide transition. If collection authorities are to promote intensive recycling, then they, too, need access to transition finance, on terms that outweigh the disincentives to change.

There are two issues:

- the demand for funds (the requirements of transition finance)
- the source of funds

(a) the demand for funds

In the long run, landfill and other disposal taxes should be set at a level that makes efficient recycling and composting competitive with mixed waste disposal. The waste industry has estimated the incremental cost of running kerbside recycling schemes at £10 per household, which (assuming an initial collection of 140kg per household annually) equates to £70 a tonne, and a similar amount could be assumed for organic collections. With existing costs of landfill-oriented waste management at £50-£60 a tonne, this suggests an increase of the landfill tax to £25-£30 a tonne would be needed to make recycling and composting financially 'competitive' with landfill.¹⁶

The current landfill tax escalator runs until 2004. If a £25 landfill tax were in place by 2007, then what would be needed in the short and medium term is a five-year programme of transitional finance to fund the costs of converting to an intensive recycling system.

To estimate these conversion costs, the Consortium of Eleven Collection Authorities in Essex undertook a study into the five-year incremental cost of a 60% diversion programme for the waste system as a whole. There were four main conclusions:

- the net system cost declined over time, in line with the experience of recycling as a declining cost industry;
- the bulk of capital costs could be covered either through private sector investment or leasing. The main need was for working capital to fund the deficits over and above the council's current waste budgets;
- the system costs were sensitive to the speed at which the residual rounds could be reduced, and to the range of savings discussed above in the section on smart recycling;¹⁷

• the aggregate transition funding requirement for a 60% diversion programme for all Essex is £40 million in revenue funds over five years assuming all capital is privately financed, of which £22 million would cover the capital servicing costs and £18 million the working capital requirements of the collecting authorities.¹⁸ This is equivalent to £8 million per year for a county of 615,000 households, and represents an increase of just under 50% on the existing collection authorities' spending on waste of £17 million p.a. The estimate does not include the recycling credits provided by Essex County Council (reflecting the costs of disposal and the landfill tax) nor of any increase in the costs of CA sites. Including recycling credits in funding requirements would add a further £3 million p.a., giving a total of £18 per household p.a.

Translated nationally and including the recycling credits transferred by the disposal authority, the Essex study suggests the need for conversion finance of £2.2 billion, or £440 million per year.¹⁹

(b) the sources of funds

There are four main sources from which the £2.2 billion could be raised:

(i) the landfill tax

Landfill tax should source £0.9 billion of the conversion programme, or 40% of the total. It could contribute in two ways:

- **The landfill tax credit scheme should be radically revised, and the funds channelled through a body independent of the waste industry with its prime focus on the expansion of recycling**

Currently the landfill tax credit scheme has a potential yield of some £100 million p.a. This is likely to rise to £135 million p.a. by 2004. If £30 million were to remain for non-waste related projects, £70 million p.a. would be available to fund conversion. The sum would rise to £105 million p.a. by 2004, and – with an increase of landfill tax to £30 per tonne but falling landfill volumes – should average some £100 million p.a. through to 2007. The target sum for intensive recycling should be set at £500 million over five years.

- **£400 million should be earmarked from the revenues derived from an increase in the landfill tax above £15 a tonne for the completion of the conversion programme by 2007/8**

(ii) producer responsibility payments

- **The PRN system under the packaging regulations should be adapted to contribute at least £350 million to the municipal conversion programme over five years.**

Since the inception of the scheme in 1997, its contribution to the changes required in the municipal sector has been derisory. Even with the increased demand for municipal packaging to meet the 60% target by 2006, the amount going to municipal recycling over four years is likely to be modest. The amount of packaging recycle that the industry estimates it will need from municipal sources is 1.2 million tonnes p.a. by 2006. Were compliance

¹⁶ See Peter Jones of Biffa in his evidence to the Select Committee in October 2000, *Environment, Transport and Regional Affairs Committee, Fifth report, Delivering Sustainable Waste Management, Minutes of Evidence, March 2001 pp.7-*

¹⁷ While in parts of Italy three stream systems have been introduced close to (or below) the costs of traditional collection, this is mainly because of the scope for savings from the large number of regular collections (three or four per week in many Mediterranean countries) once food waste is separated out.

¹⁸ *The Essex High Diversion Programme, Prospectus, Chelmsford, June 2000. The local authority share of new fixed investment is estimated at £35.5 million. If this was publicly financed, it would lower the revenue support to £18 million, and require an overall sum of £53.5 million to fund the transition.*

¹⁹ In October 2001 Toronto announced its plans to achieve a 60% diversion target by 2006, with an incremental cost of £5 a tonne, in part because of the substantial savings it stands to make from cutting down its waste exports to landfill in Michigan.

schemes to pay the average municipal recycling cost of £70 a tonne, this would yield £84 million p.a. If, however, PRNs remain at their current average of some £21 a tonne, the level in 2005/6 would be only £25 million p.a., no more than a fifth of the total funds being contributed. The total four-year sum going to local authorities at existing PRN prices would not exceed £100 million out of a forecast £500 million to be paid in by the packaging-related firms, compared to an equivalent £4.4 billion from their packaging counterparts in Germany.^{20,21} Significant funds will continue to go to processors, either to finance low cost/low capture forms of recycling or as windfall gains.

The PRN system and its administration need to be changed. The following measures should be considered:

- raising packaging targets to the 80% level already achieved in Germany rather than the 60% figure for 2006 likely to be agreed in Brussels;
- establishing a PRN sales intermediary to provide greater co-ordination between the supply and demand of the compliance schemes, and to establish a guaranteed floor price for PRNs of £40 a tonne. Any operating deficit of the intermediary would be funded retrospectively by the compliance schemes;
- directing all processors to issue PRNs directly to suppliers, at the same time requiring compliance schemes to purchase the PRN rights for municipally funded recyclates for at least 1 million tonnes up to 2004 and 2 million tonnes up to 2007 at a minimum of £40 a tonne.

These sums, amounting at least £320 million during the period to 2007, would be supplemented by similar arrangements under the producer responsibility directives due for introduction by 2006.

²⁰ It might well be less in the event that a shift to 4 stream systems would produce more packaging waste from the estimated 4.6 million tonnes in the domestic waste stream than the 1.2 mt forecast as required for the 60% target. Supply would exceed demand, and put downward pressure on PRN prices in the process.

²¹ If the 50% target for the recovery of packaging waste in 2001 is met, it will have cost the 'obligated parties' some £100 million, little of which has gone to the municipal sector. The £100 million figure is given in the Government's September 2001 consultation paper on Recovery and Recycling Targets for Packaging Waste in 2002.

(iii) direct government funding

- **Direct funding of £700 million over five years, or £140 million a year should be contributed directly by central government**

This would include the current programmes:

- £140 million for recycling in 2002/3 and 2003/4
- £220 million for PFI schemes up to 2003/4 (if this programme cannot be adjusted to accommodate local collection and processing systems rather than capital intensive/single contract facilities, the finance should be switched and added to the £140 million recycling programme)

- £50 million of New Opportunities finance for community-led recycling schemes

This should be supplemented by support from SRB allocations, Public Service Agreements, and a further tranche of programme finance in the next three-year spending review.

(iv) local authorities

Disposal authorities are already set to make a major contribution to recycling through the recycling credit scheme. They should not be required to contribute further but should rather be offered incentives to promote recycling through rebates in landfill tax (see above). Some collection authorities also make significant contributions (in Essex in 1999/2000 the eleven consortium boroughs were already providing £1.6 million for recycling). Nevertheless:

- unitary and collection authorities should take responsibility for contributing £250 million to the conversion scheme from their share of the £1.127 billion allocation made in the current spending

review, and or any similar allocation in the subsequent round

The government should ensure that this happens and if necessary issue the requisite guidance for the final two years of the current review period.

(c) conclusions on sourcing

There are already substantial waste-related funding flows circulating in the economy, all of which are set to expand. The landfill tax credit scheme and the packaging recovery arrangements have together generated some £750 million in the past five years, and the Government's current spending review plans to inject a further £500 million over the three years up to 2003/4. This finance is substantially lower than that available in high performing recycling economies like Germany, but could yield substantial effects were it to be used 'smartly'. This has not been the case. The funds have remained uncoordinated, their control and use shaped more by concerns to increase commercialization and limit public expenditure than by achieving a major shift to waste minimization.

A five-year conversion programme to intensive recycling should not therefore be held back by lack of funds. What is required is a 're-wiring' of existing funds, and a clear direction given for their use. This in turn would provide the context for a major programme of private investment – in all stages of the 'closed loop' economy – which government leadership on recycling has stimulated elsewhere.

Institutions

One of the developments in the field of industrial policy over the last decade has been a shift from the arguments about state versus markets, to the design of institutions. The literature on successful long wave transitions from one industrial era to another has similarly moved beyond a primary focus on

technology to the interplay between new organizational paradigms and the emerging technologies. Historically, the countries that have been able to develop appropriate organizational structures have been best able to capitalize on contemporary technological possibilities.

The new interest in organizations by economists cuts across the former poles of debate. It is no longer a question of the shift from the public to private sector (or vice versa), or from tax/grant-based economies to markets. It is rather an issue of the nature of the institutions in which markets are embedded, or that undertake public/non-market functions. Put another way, this literature introduces a post-modern perspective in the analysis of the economy, emphasizing that there is no single homogenous state, just as there is no homogenous private market. There are many states and many markets, and the success of transition will depend on the creative parts of each forming a progressive coalition that can establish a new order.

In the case of waste this poses a particular challenge. On the one hand it requires a state that can play a creative public role as long-term strategist, a setter of parameters and a guardian of public and environmental health. On the other it needs to open out the former waste sector to the knowledge industries and to the dynamic of the third 'social-market' sector, whose new ways of reconciling the market with social and economic goals is so pertinent to Zero Waste.

New governance

As far as the public functions are concerned, this report argued earlier that there have been serious limitations to the neo-liberal model of government as it operated in the waste field in the 1990s. There are three institutional problems that need to be directly addressed:

- the relegation of the government function of strategic direction, and the redefinition of its role as market facilitator, has led to subaltern culture in government. It is skilled in critical faculties and the management of meaning, and in the application of market analysis to external propositions. But it has been leached of know-how and strategic confidence, and has therefore failed to establish an autonomous public identity for a function that demands it;
- there has been a consequent fragmentation of policy and ineffectiveness of implementation;
- a large, Weberian, rule-based organization (the Environment Agency) has been created to administer the entrepreneurial function of environmental protector and promoter of clean production.
- *Waste Minimization Boards* should be created for each waste disposal area that would combine the strategic waste functions of collection and disposal authorities. The main task of the Board would be to advance Zero Waste within that area. Control of the bodies would rest primarily with the existing collection authorities, which would delegate the operational side of disposal to the present disposal authorities.
- The central government resource innovation units would form the core of a network of *waste minimization units* attached to the Waste Minimization Boards throughout the country.
- *Neighbourhood ownership of hazardous facilities*. A new model for the administration of disposal assets is required, based on the principle that the 'pollutee controls'. The waste disposal rights attached to sites with disposal facilities would be placed in the hands of local community trusts. The facilities would be managed under contract by specialist disposal companies, and jointly administered by the relevant local authority body and the trust.

What is needed is a new model of waste governance. This would build on the positive features thrown up by the innovations of the 1990s (the readiness to consult widely, to decentralize, and to experiment) and the developments of the past two years.

- The *Policy and Innovation Unit* in the Cabinet Office is in the best position to develop the long-term Government strategy for intensive recycling which up to now has been so lacking. It needs to be complemented by two things: (a) *resource innovation units* in each of the principal Departments concerned with waste, staffed by specialists who understand the new paradigm – since their task is to help make it work – as well as those with direct experience of the new paradigm in practice; and (b) a small group of staff in the *Central Delivery Unit* to work with the resource innovation units from the departments in implementing the strategy.

The principal benefit of this arrangement would be that those most affected by the existence of a disposal facility should have ownership rights vested in them as custodians of health and environmental protection. They would enjoy the 'locational rent' generated by the planning permissions granted to particular sites, and would be required to use that rent to employ specialist technical advisers and finance an independent testing regime. It would also be able to invest in the betterment of the area affected by the facility. All liability for the sites should rest with the facility operator and the local authority.

The trusts should be elected by and report to the relevant parish councils, and include on

their council of trustees people with environmental knowledge whose role would be to contribute to the delivery of the environmental purposes of the trust.

Granting ownership over waste disposal rights represents an internalization of externalities which complements the principle of 'polluter pays'. In this case the internalization is not restricted to the receipt by those subject to pollution of post-facto compensation payments (the 'pollutee paid'), but involves control of the terms of operation and monitoring of practices which would reduce the dangers of pollution in the first place.

The ownership of assets provides the material basis for a regime of socializing information about environmental hazards, and providing contractual rights over operational conduct.

The environmental planning, protection and enforcement functions of the *Environment Agency* with respect to waste need to be redefined and re-organized.²²

- the function of providing IPC and IPPC certification for new and expanded facilities should be subject to greater public scrutiny by opening out the EA's decision-making to public inquiry;
- the monitoring of facilities should be undertaken by a strengthened inspection and testing service, whose terms of service should preclude them from later working for companies for which they had the responsibility of inspection;
- the prosecution function should be spun off as a stand-alone *Environmental Prosecution Service* to which both the EA inspection service and the neighbourhood trusts could submit evidence;
- the Environment Agency should extend its remit to include an advisory function

on pollution control and waste minimization innovations.

Intermediary institutions for zero waste markets

In addition to institutions to promote clean production, there are four functions that have to be fulfilled in facilitating the conversion to a Zero Waste paradigm:

- market development
- systems know-how
- a re-oriented profession
- financial intermediaries

The nature of the new waste system that is established will depend on which institutions perform these functions and how far they are open to the kinds of knowledge and social economy on which Zero Waste depends.

Market development

The first of these is now being undertaken by WRAP, a not-for-distributed-profit company limited by guarantee, set up in late 2000, and already providing a level of leadership in market development which had been absent from either the public or private sectors. WRAP has rightly given priority to exploring uses and markets for compost including the establishment of standards, and is in the process of allocating seed funds for a substantial expansion of newsprint capacity by tender.

Developing the supply side

This is the demand side of the new recycling. Where new initiatives are needed is on the supply side. There is still a serious shortage of know-how in both recycling and composting, in a field which also calls for the new ways of working set out in section four. The large

²² *The Government is currently undertaking a five-year review of the performance of the Environment Agency. The draft report of this Review was summarized in ENDS no 320 September 2001. The report does not address the main issue that have emerged in the conduct of the Environment Agency which is the problem of getting a rule based organization to take a proactive role in environmental protection, coupled with the issue of regulatory capture.*

waste companies have had difficulty in entering this field effectively, relying as they do on traditional collection techniques and capital-intensive sorting and processing. The highest recycling and diversion rates have been achieved by the community sector and by creative council officers working with Direct Services Organizations (DSOs).

Yet their numbers are still limited, and their resources restricted. The community sector has been successful in areas such as social marketing, the development of new types of collection vehicle, the reskilling of collectors, waste composition analysis, local composting, joint materials marketing, and the publication of an excellent new journal. They are, however, with one exception, still relatively small organizations, working with limited finance, and not yet with the capacity to offer a full four stream Zero Waste service for any district or borough. Similarly, the innovative councils and their DSOs are necessarily confined to their own boundaries and operate within the local authority financial restrictions. Neither of them yet constitutes a developed supply side for the extension of smart recycling throughout the country.

A new intermediary institution is needed to develop the supply side in the same way that WRAP is developing demand. In many jurisdictions abroad this role has been played by an animating agency. The customary functions are the development of operating manuals, of recycling software and management information systems, of social marketing materials, technological search and training. They play a role similar to that of the 'real service centres' in the industrial districts of Italy and Spain, providing a range of information, strategic planning, training and advice to small firms, similar to that supplied internally in large firms by central service departments. In the UK context this would be part of the job description of a Zero Waste Agency.

Investment finance

But there is also a question of finance. The 'new wave' recyclers have not attracted finance from the conventional banking network, partly because of a low asset base (in the case of the community sector) or (in the case of local authorities) because of statutory restrictions on borrowing.

Nor has recycling been seen as a bankable proposition, in the same way as a large disposal contract with guaranteed gate fees over twenty years. Instead, community and DSO recycling has grown using working capital advanced by client councils, supplemented by grants. For the most part, grant funding rather than private investment has been the rule for the expansion of municipal recycling.

This remains an option for the kind of conversion programme outlined above. The funds realized from central government or the landfill tax could be granted directly, or through an intermediary institution such as a Zero Waste Agency. The latter has the advantage that the grant giving is undertaken by those with knowledge of the sector, and can be supported with other intangible services. As a general rule, grants of this kind are best administered through flexible bidding systems, in conjunction with specialist advice provided to applicants in the process of bid preparation, and specialist adjudicators of the applications.²³ An alternative option would be to shift the bulk of available funds away from grants to investment. The rationale for this approach is that in the long run intensive recycling should reduce council waste budgets as in the leading North American municipalities. If this is the case then there is money to be made. There should be a positive rate of return on investment, so that intensive recycling should be bankable.

²³ *The New Opportunities Fund has developed fruitful methods of managing the bidding process, including joint seminars for applicants, and individual specialist advice.*

Social venture capital

The investment approach opens up a new range of possibilities for the technical support and finance of intensive recycling. Because of the economic uncertainties of a new sector and the long payback period, a transitional institution is required based on the model of social venture capital and development banking. It would be set up, like WRAP, as a company limited by guarantee. Its task would be to promote social enterprises to undertake smart recycling, working in the first instance with client local authorities to expand existing enterprises or promote new ones which would draw together on their boards and in their management the many skills and cultures required.

In some instances the enterprise might be a joint venture of an existing community recycler, a DSO, and an overseas established recycler. In others it might be a subsidiary of an existing waste company in conjunction with the community sector. Or the interest of a range of suppliers might prompt a local authority to break up a borough wide contract into smaller areas for the suppliers to manage independently.

There would be four features of the financial package:

- the contract between the social enterprise ('the contractor') and the local authority would cover all aspects of waste management within the collection authority, to allow the full system economies of intensive recycling to be realized;
- the contractor would guarantee to provide a comprehensive service to the collection authority for the existing budgetary cost (in real terms) over a ten-year period;
- the contract would be based on partnership working, with the council contributing agreed resources (such as publicity, depot and bulking space, maintenance services, some working capital) as a condition for the contractor's financial guarantee;
- the social investment trust as the venture capital instrument would provide capital in the form of equity, preference shares, unsecured loans, and (for some types of expenditure) grants, and would also act as guarantor for the financial and performance package to the client authority.

The advantage of this arrangement is that it would remove financial risk and the transitional cost premium from the client authority – both of which have been such barriers to the expansion of recycling. With this on offer, the contractor would be in a position to negotiate use of council assets at a low marginal cost, and at the same time would be encouraged to adopt smart recycling techniques in order to minimize debt.

More generally, while the goals of both the social investment trust and the contracting enterprise would be the expansion of intensive recycling and regeneration, this would be subject to commercial constraints. As the experiences of the social enterprise sector indicate, the combination of social and environmental goals subject to trading disciplines encourages production efficiency. Whereas grant applicants tend to inflate costs in their applications, those receiving a loan have an interest in containing them. The investment model would build in a drive for innovation and efficiency that has often been lacking in grant based organizations.

Another relevant social enterprise lesson is that other investment is attracted by the goals of the organization rather than its profitability. The pressure on large

corporations to observe a triple bottom line has meant that they are increasingly looking for well-managed outlets for support or investment that meet social and environmental criteria. Both the *Zero Waste Investment Trusts* and the new generation of *recycling enterprises* would be attractive to corporate and ethical investors from this perspective.

Initially a Zero Waste Investment Trust would be established nationally and used as an instrument for the placing of funds channelled from the Landfill Tax Credit Scheme and a reformulated Private Finance Initiative (PFI). It would form local trusts – aiming to attract leading entrepreneurs with an environmental orientation from the commercial and community sectors on their board. The Trusts – like the most effective development banks – would employ technical specialists, as well as business and financial managers, to provide advice and support to the recycling enterprises and to the Trust's financial arm.

The overall advantage of this approach is that it would introduce an economic dynamic directed towards Zero Waste. It would not be dependent on a continuing flow of grant funding. Returns from the investments would be channelled back into an expansion of the project. Although its initial focus would be on local authority recycling, it would be expected to diversify and invest in commercial and industrial recycling projects (which commonly have a much shorter payback than the municipal sector).

A supply side Investment Trust would have an interest in promoting training programmes for the management and operation of intensive recycling systems in its area, either as part of existing courses and institutions or as a stand-alone Zero Waste Academy. An Academy, like a *specialist technical school on the continent*, would combine teaching and research on the full range of Zero Waste issues, and act as a catalyst for these issues in other universities and colleges.

With WRAP promoting the demand side, and the Investment Trusts enabling the supply, the UK would have the potential to implement a programme of conversion to intensive recycling which would be economic and innovative, and which would provide a step change in the movement towards a Zero Waste economy.

A new way of seeing

Zero Waste has three distinguishing characteristics:

- its starting point is not the waste sector as such but the systems of production and consumption of which waste forms a part. It is an industrial systems view rather than a view from one (the final) part of the economic chain;
- it approaches the issue of waste and its redefined role from the perspective of the new industrial paradigm – looking at it in terms of the knowledge economy and complex multiple product systems;
- it proposes a different model of environmental policy and of the process of industrial change.

Intensive composting and recycling remain at the centre of Zero Waste as a strategy, but its impact goes beyond that to the contribution of the waste sector to the wider project of industrial redesign.

In this respect Zero Waste has multiple perspectives – of clean production, of atmospheric protection and resource conservation. Taken together they provide a new way of analyzing waste – a new way of seeing. Although it is a contributor to environmental degradation, waste cannot be treated in isolation. It is only the final stage of a much wider chain of production and consumption in which the problems associated with waste are rooted. In this sense waste is a

symptom as much as a cause, a sign of failure in the design and operation of the material economy. It provides an insight into deeper structures, as well as an opportunity for changing them.

For these reasons, while Zero Waste provides the basis for reformulating policies for waste management, it is not just about cutting waste going for disposal, whether landfill or incineration. It has wider horizons. Its aim is the restoration of pre-industrial circuits – the biological circuit of organic materials and the technical circuit of inorganic ones – using post-industrial means. It offers a way in which the negative detritus of an earlier era is transformed – through eco-design – into a positive nutrient for clean production.

Zero Waste is a manifesto for the redesign of the material economy, and at the same time a set of tactics for realizing its principles in practice. In this sense it is both visionary and pragmatic, both long-term and immediate.

It is also a description of what is already happening. Over the past decade a change has taken place in the industrial landscape that has been too little noticed. The change is occurring in two fields – in the way waste is managed on the one hand, and the way it is produced on the other. The first is creating a new waste industry, the second a new industrial approach to materials. Both are part of a wider green industrial revolution.

The unabridged version of this document describes the key features of an intensive recycling economy. It is referred to as 'smart' recycling since it applies the principles of the knowledge economy and flexible manufacturing systems to the recovery and recirculation of materials. In its most challenging sector – municipal waste – it combines in a remarkably innovative way all three spheres of the economy – the household, the state and the market.

When the system is introduced in this way – quite apart from its reduced environmental impact – it is commonly a cheaper way of managing waste than the old disposal system. Although it is necessarily more expensive to run multiple collections rather than one, leading programmes have found ways of restricting the cost increases for separated collections of dustbin waste to as little as 20% above the single mixed waste system. The critical variables are the savings that can be made on residual collections once high recycling is established, the use of low cost/high productivity vehicles and bins for the separated waste, and the capture rate of materials. Against the increase in collection costs are set the savings from disposal on the one hand and the sale of materials on the other. The higher the disposal costs and the higher the sales income, the sooner will intensive recycling systems lead to budget savings.

These can be considerable. Seattle cut its waste budget by 8% in 6 years. In Quinte, Ontario, the savings reached 38% in eight years. In a recent survey of high recycling programmes in the USA, nine of the fourteen for which comparable cost data were available reduced their waste budgets through intensive recycling, and a further four would have done so if the rise in landfill costs had not offset the collection savings. The economics of Zero Waste should be seen as an opportunity, not a constraint.

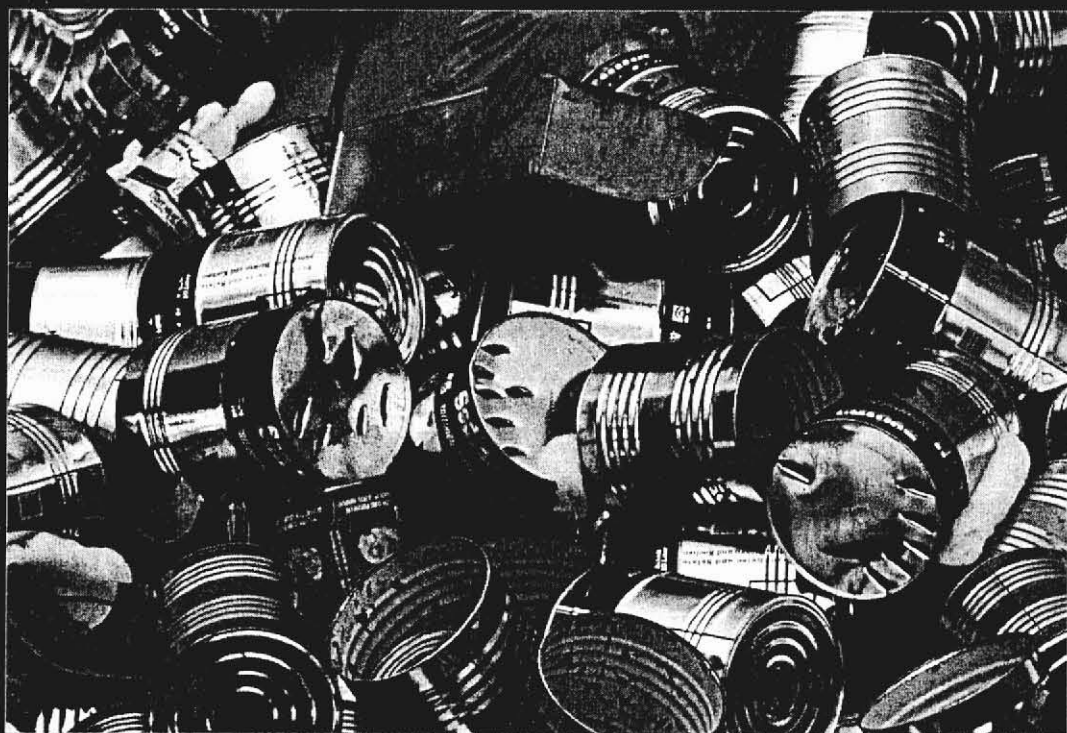
For those at the bottom of the Zero Waste mountain it is hard to believe it can be climbed. There is incredulity that towns and cities, and even countries, are already halfway there, and have saved money in the process. There is no single model, no one set way. But a broad pattern is emerging which makes it easier for those still looking up from below.

For further information about Zero Waste and a copy of the full, unabridged text, please contact:

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As a pollutant, waste demands controls. As an embodiment of accumulated energy and materials it invites an alternative. The one is a constraint to an old way of doing things. The other opens up a path to the new.



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