

A Wasted Opportunity?

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How to get the most
out of Britain's bins

Professor Chris Coggins
and Robert McIlveen

edited by Ben Caldecott



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Contents

	Acknowledgements	4
	Executive summary	5
	List of terms	8
	Introduction	10
1	What are we trying to achieve?	15
2	Local government's key role	19
3	From waste disposal as a public service to a resource management system?	25
4	Resource management: new markets	30
5	How to pay?	39
6	What should be collected and how?	43
7	Implementation	49
	Conclusions and recommendations	53

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Executive summary

Waste is a potentially valuable resource that is being left largely unutilised. This report outlines how to get the most from Britain's bins while cutting household waste bills and removing the hassle people experience from having too many bins and overly complicated waste collection patterns. By getting the local government structure and incentives right, the full potential of the materials we currently throw away can be realised. The UK still puts more than half its waste to landfill, with more than 15.5 million tonnes of household waste being buried and left to rot in 2007-08. This runs the risk of fines of up to £366 million pounds due to missing European targets as well as missing out on the value left untapped in the waste stream.

The reforms proposed in this report could cut household waste bills, currently around £100 per household per year, by up to half. These savings come from realising increased value from waste by enhancing recycling and energy recovery, economies of scale in collection and disposal and the further use of incentives.

Our present system achieves poor results because it is not designed for the challenges we face. On climate change the drive to recycle more has led to more carbon emissions from some materials. Food and biodegradable waste that could help deliver energy security by providing nearly 50% of the gas needed by households in the UK is instead sent to rot in landfill and not used.

This report seeks to balance three principles: environmental standards and resources, economic efficiency and ease of use for householders. At present, the waste system does too much damage to the environment while missing out on the economic value of the waste stream and over-burdening householders with more bins than is reasonable. Our waste system has developed piecemeal over the past 150 years without ever being reformed properly. Now is the time to do so. The system and its infrastructure are unfit for purpose.

The recommendations in this report offer an exciting future. Four groups of recommendations are made. First, getting the structure right is crucial to delivering the waste services Britain needs. The historical legacy of waste services is a hindrance to their future success, making reform essential. Second, consistent incentives are needed to deliver systemic change. At present waste has lots of conflicting incentives for different actors. A credible financial framework for the long term is needed to give adequate incentives to all involved. Third, collection services must be designed that provide excellent services to householders and deliver on quality of separation for recycling. Finally, the potential for food and residual waste as an energy source must be encouraged and developed.

Implementing the following reforms will lead to a waste system which will get the most out of Britain's bins:

Structural Reforms

Abolish the present waste collection and disposal authorities and create single-tier waste authorities in England. By simplifying local governance of waste in many areas, clear incentive structures can efficiently bind in the key actors in the waste system: households, local government and the waste industry. This can also save money.

Abolish recycling tonnage targets for local government. Tonnage targets lead to collecting materials of marginal environmental and economic benefit. Abolishing National Indicators 191, 192 and 193 will, in combination with the new single tier authorities, focus waste services on achieving their environmental, economic and social goals.

Commercial and industrial (C&I) waste from small businesses should be integrated with municipal waste. Throughout most of Europe, commercial and industrial waste similar to household waste is included in the definition of municipal waste. Reforming the legal definition in the UK would increase the economies of scale for local government and the private sector to invest in waste infrastructure. This change should be introduced over time with an opt-out for an introductory period to smooth transition from contracts already signed.

Finance and Incentives

The landfill tax should be reformed into a broader waste tax covering all disposal processes in line with the waste hierarchy. The rates of this tax would reflect the relative damage done to the environment by different processes and incentivise reuse, recycling and energy recovery, including the separation of food waste where possible. By introducing taxation on incineration a clear preference is signalled to reduce, reuse, recycle or compost where possible. To limit uncertainty, escalating rates should be set over a long enough period to encourage investment.

Itemise waste charges on council tax bills as a precursor to direct charging. Waste is politically controversial largely because of the council tax. Demonstrating the relatively small amount each household pays towards waste services in a similar way to police or fire services would enable a shift over time to direct and variable charging. This enables the use of incentives to encourage reluctant households to participate, embedding the householder in the incentive structure found in the rest of the system. Bringing much-needed transparency to how waste services are funded would enable taxpayers to hold their local authorities to account more effectively. Local councils should be free to offer incentives, discounts and other innovations in how waste is charged for, driving down costs and improving value for money.

Collections

Councils should be prevented from forcing an excessive number of bins on households. Councils which require their residents to keep five bins risk overloading householders and generating resentment. Three bins, for food waste, dry

recyclates and residual waste, should be the limit on what householders can be expected to put up with, and government should regulate to that effect. This implies that recyclates should be separated either at a materials recovery facility (MRF) or by kerbside segregation.

Household collections should be standardised over time to around five or six basic collection systems. The variety of detail and combinations of materials collected is a cause of frustration and confusion. Encouraging local government and the waste industry to standardise would reduce these problems and allow for enhanced national level education.

The national deposit scheme proposed in Policy Exchange's report *Litterbugs: How to deal with the problem of littering* should be introduced, resulting in improved removal of materials such as glass, cans and plastics from the waste stream. Diverting containers, especially those made of glass, from recycling would improve the quality of recycling collections and simplify separation.

Food waste should be collected separately. Removing food waste from the residual waste stream could significantly reduce greenhouse gas (GHG) emissions enabling it to be used in anaerobic digestion (AD). It also decreases the need for collecting the remainder of each household's waste and drives up recycling if combined with alternate weekly collections. In areas of high population density and especially high-rise flats, separation is unlikely to be possible and should not be enforced.

Energy

Using waste to generate energy should become a central pillar of government policy in this area. This is currently underutilised in UK waste management. Energy can be extracted from waste through the anaerobic digestion of organic waste (principally food) to generate biogas and through the use of energy from waste (EfW). Both of these are a much better alternative to landfill for residual waste. EfW plants should include combined heat and power (CHP) where possible, so that sustainable, cheap and low carbon electricity and heating can be provided simultaneously for local communities. Together, these changes will help us to reduce our GHG emissions significantly and deliver increased energy security.

List of terms

Alternate Weekly Collection (AWC) – commonly known as fortnightly bin collection, this is the system in which recyclable materials are collected one week with residual waste, ie everything else, collected the alternate week.

Anaerobic Digestion (AD) – a process by which organic matter can be processed biologically to produce biomethane and a digestate. This is already used in the treatment of sewage and farm slurries and is being trialed for treating food waste.

Commercial and Industrial (C&I) Waste – waste generated by businesses rather than households. In the UK waste from small businesses similar to household waste is legally distinct from municipal waste, mainly from households.

CO₂ equivalent (CO₂e) – a measure of the warming effect of mixtures of greenhouse gases, expressed as a standard concentration of CO₂. Thus in 1998 CO₂ concentration was 365 ppm of dry air, but the effects of methane, nitrous oxide and other greenhouse gases in the air at that time were in warming terms equivalent to another 47 ppm of CO₂; the result is a CO₂e of 412 ppm.

Energy from Waste (EfW) – the process of recovering the energy embedded in material through a variety of processes. Traditionally this has meant incineration with energy recovery, but has expanded to include anaerobic digestion, mechanical and biological treatment (MBT) and a variety of other processes.

Greenhouse Gas (GHG) – in the atmosphere, GHGs such as CO₂ trap sunlight as heat, thus contributing to the greenhouse effect which keeps the Earth's surface warmer than it would otherwise be. The six GHGs defined by the Intergovernmental Panel on Climate Change comprise carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆).

Landfill Allowance Trading Scheme (LATS) – one of the financial drivers facing waste disposal authorities, LATS allows those authorities which send less waste to landfill than their allowance to sell rights to the excess to authorities who have exceeded their allowance. The aim of LATS is to ensure that England as a whole meets the landfill directive targets.

Materials Recovery Facility (MRF) – a facility for separating materials for recycling. Typically they would be automated with some manual work to separate paper, cans, plastic and in some cases glass. They are used to sort collections of mixed recyclable materials.

National Indicators (NI) – the means by which local government performance is measured by national government. NIs 191, 192 and 193 relate to waste services.

Residual waste – the remainder of collection after recycling or food waste has been removed.

Waste Collection Authorities – usually district councils in areas with two-tier local government. They are responsible for collecting waste from households before passing it on to the waste disposal authority to process.

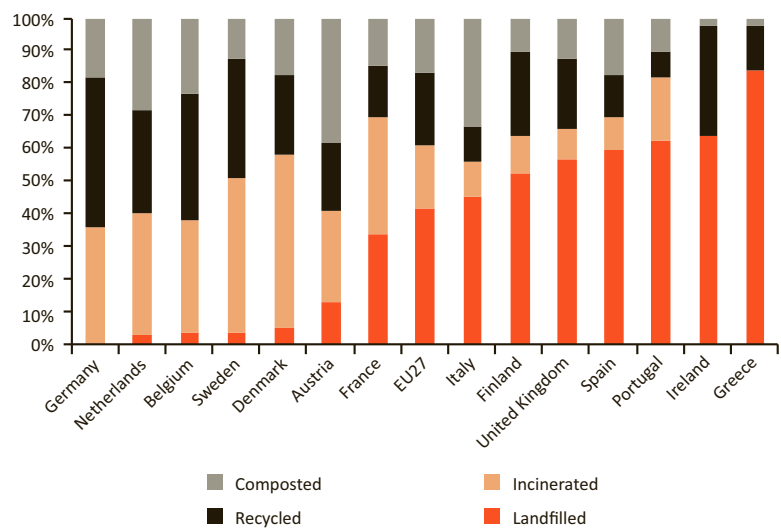
Waste Disposal Authorities – usually county councils but also bodies such as Greater Manchester Waste Disposal Authority or Western Riverside Waste Authority in London. They are responsible for processing waste, sending it to landfill, EfW, composting or recycling.

Waste and Resources Action Programme (WRAP) – the government’s main delivery body which works to reduce waste, increase recycling and develop markets for recycled and recovered products and materials.

Introduction

The UK is doing a poor job of dealing with its waste compared to similar European countries. The UK is much more reliant on landfill, the most environmentally damaging way to deal with waste, than Italy and France, not to mention countries which might be expected to have excellent performance such as Germany and Sweden. Most unimpressively, it is even above the average for the EU27, which includes newer members with very high landfill rates (Figure 1). Recycling and incineration with energy recovery both have room to grow in the UK.

Figure 1: Landfill, incineration, recycling and composting in selected EU states in 2007¹



As well as poor environmental performance, the UK is missing out on the potential value in the waste stream. Recycled materials and energy outputs are potentially valuable; energy from waste (EfW) could meet up to 17% of the UK’s electricity needs.²

There has been almost no progress on reducing total waste arising, and little advance in energy recovery (Figure 2). Recycling is only one way of improving what we do with waste. Expanding energy recovery and making progress on waste reduction are vital to bringing landfill rates down and extracting more value from our waste.

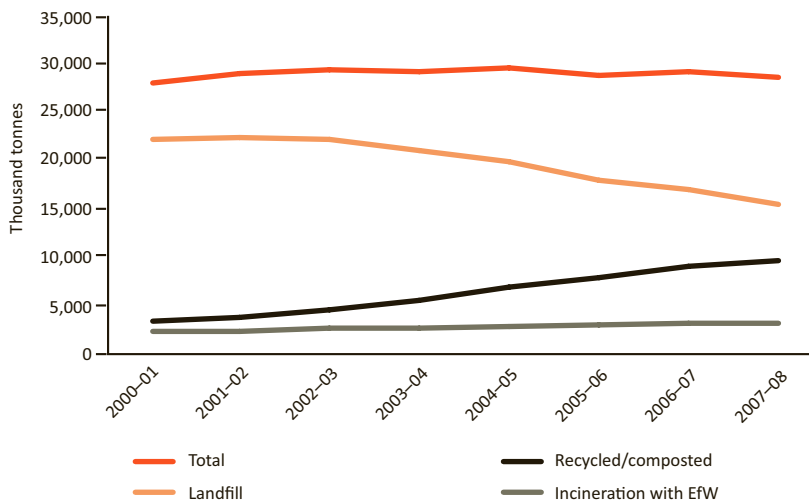
The concept of resource management is central to this report. This approach sees waste as a resource to be recovered rather than a problem to be disposed of.

¹ “Half a ton of municipal waste generated per person in the EU27 in 2007”, Eurostat news release, 9th March 2009

² “Quantification of the Potential Energy from Residuals (Efr) in the UK”, ICE/Oakdene Hollins, 2005, p36

A shift from a waste disposal mindset to thinking about the resource flows that currently end up in landfill is the key to getting the most value and environmental benefit from the waste system.

Figure 2: How much waste we produce and what happens to it (England)³



The history of waste services in the UK

The Public Health Act 1848 established the general and local boards of health and banned the indiscriminate dumping of waste in the streets. This was the first legislation dealing with waste. Collection and removal of waste to open dumps at the edges of urban areas began to occur.

Further Acts extended and reorganised the role of local waste authorities. By 1875 this had developed to the point where every sanitary authority was required to provide for the removal of household waste when required by the local government board, and each householder was obliged to place his waste in a moveable receptacle – the first legal recognition of the dustbin.

In contrast to open dumps, the first municipal incinerators, or “dust-destructors” as they were known, began operations in the 1870s. By 1914 there were 338 municipal destructors in use. Of these, 295 had boilers to recover heat, including 77 which generated electricity.⁴ Incineration was an attractive solution because it offered a hygienic way to dispose of waste that could otherwise pose a threat to health.⁵

The Public Health Act 1936 set the structure for waste policy up to the 1980s, as well as expanding the legal definition of waste. Over the intervening years, piecemeal reforms occurred without fundamentally changing how waste services were organised. The formal separation of waste collection authorities (district councils) and waste disposal authorities (county councils) dates from the Environmental Protection Act 1990 and remains in place today.

There has been some progress on improving recycling rates, but it has been slow. This is largely because of the complexity of how waste is governed. Responsibility is split between district councils, acting as waste collection authorities, and county

³ <http://www.defra.gov.uk/environment/statistics/wastats/index.htm>, Defra 2007

⁴ Herbert L, *The History of the Institute of Wastes Management 1898-1998*, IWM Business Services, 1998

⁵ Cooper T, “Challenging the ‘refuse revolution’: war, waste and the rediscovery of recycling, 1900-1950”, *Historical Research*, 81, 214, 2008, 710-731

councils, acting as waste disposal authorities. The former face targets relating to how much recyclable waste they collect whereas the latter face financial penalties to avoid landfill. These targets do not sit well together for designing services to get the best environmental and economic outcomes.

Waste services and local government have a long history; the public health impact of waste was one of the early drivers of the growth of municipal government. This matters because the organisation of waste services today is a product of their origins in a simple, public health approach to waste disposal. The environmental agenda does not sit well with this because it requires much more investment and much stricter pollution standards.

Waste services today

Waste services are delivered by a combination of local government and private operators. In areas with two-tier local government, the district council acts as the waste collection authority and is responsible for collecting bins and recycling. It then passes the waste on to the waste disposal authority, the county council, for landfill or incineration.

In unitary authorities, the same council does both tasks. In some metropolitan areas boroughs have pooled their disposal functions to mirror the two-tier system, for example Greater Manchester Waste Disposal Authority or the groups of boroughs in London. Waste is an area where securing economies of scale is becoming important, leading to co-operation across local government.

The actual delivery of services is done by private contractors. These are either large national or multinational companies or the former council service privatised to become a direct services organisation.

Three principles for the future of waste

This report will recommend far-reaching changes in how waste services are delivered and what they achieve. It will balance three key principles, creating a framework where the right priorities are used to unleash the potential in Britain's bins. These principles are taken from the basic idea of sustainability – the “triple bottom line” of economic, social and environmental needs.⁶ How these principles interact is crucial because some elements complement each other for the most part, while others conflict.

Environmental requirements are the driving force behind changes to waste management. Waste gives rise to a variety of environmental hazards, such as carbon emissions, land pollution and resource scarcity. Designing a waste system to reduce the impacts on the environment from this essential public service is the primary challenge addressed by this report.

Meeting the economic bottom line is not just a question of minimising cost to households but also of maximising the value recovered from the waste stream. There are lots of potentially valuable materials in the waste stream currently being buried and left to rot. A rational system should seek to exploit the potential value of this waste through well-designed separation and processing. With the right incentives, an economically efficient service can grow within strict environmental standards.

⁶ Elkington J, "Towards the sustainable corporation: Win-win-win business strategies for sustainable development." California Management Review 36, 1994, no 2: 90-100

The final principle is that collection should be easy for householders to use. Some councils require householders to use five bins, which is clearly excessive. How much households can separate their waste will vary, but collection systems should be designed to get the most from everyone. Some element of standardisation is a key aim, to reduce confusion over recycling and to enable national level education and labelling.

Tensions between these priorities are largely centred on simplifying collection. Separation of waste materials leads to increased quality of recyclates and thus higher resale prices. However, the cost of separation in terms of householder time is not insignificant, especially if not subject to incentives. Clever design of collection systems is therefore necessary to make sure easily separable materials are collected together while taking more problematic materials out. The waste industry and local government are well placed to deal with such complexity, but householders should not be expected to.

“ Environmental requirements are the driving force behind changes to waste management ”

Other considerations

Beyond these underlying principles there are a few themes running throughout this report. The importance of commercial and industrial waste (C&I) has been overlooked by focusing exclusively on household waste, yet the two streams are very similar in composition in some cases. There is much missed potential in this sector because local authorities are wary of engaging with waste from businesses and often fail to plan adequately for infrastructure to deal with it.

Generating energy from waste is an exciting area. While generating electricity and heat from incinerating waste is a very well-established technology, it is much less common in the UK than in other European countries, notably those with very low landfill rates. More modern approaches, such as anaerobic digestion (AD) of organic waste and other exciting new technologies, offer opportunities to contribute to decarbonising transport, heating and electricity while reducing the emissions and pollution currently produced by waste.

Planning is a key concern for any infrastructure, and for waste it is a particular challenge. Most waste infrastructure is unpopular with many local residents. Opposition to incinerators has been particularly strong. Transport logistics, air quality concerns and other challenges make obtaining planning permission for new infrastructure very difficult and the Planning Act 2008 does not cover waste infrastructure in most circumstances.

Key questions and methodology

Waste needs reform because the UK is nowhere near hitting its potential environmentally or economically in this area. Reforming the local governance of waste is one key step, as is getting the incentive structure right so that industry and local government are all working to the same goals. Integrating small business waste and household waste offers economies of scale and should be pursued, while ensuring that householders have an appropriate service is paramount. The outcomes of these structural reforms will be significant, with

new infrastructure and technology deployed to get maximum value from waste with minimal environmental damage.

This report covers a wide range of questions regarding waste, including responsibility, technology, finance, incentives and governance. Throughout, the three principles of environmental quality, economic efficiency and household convenience are woven in as the guiding principles. Resource management, which covers the first two, is a key part of the analysis.

In producing this report, a range of stakeholders were interviewed, from industry executives and civil servants to NGOs and independent experts. A surprising level of agreement was found on many issues.

In addition, three roundtable events were held to discuss key issues: AD and incineration; finance, markets and incentives; and service design and delivery. These brought together a range of views, found common ground and also highlighted the points of conflict among the organisations and people represented.

1

What are we trying to achieve?

As it stands, it is difficult to state succinctly what is the ultimate goal of government policy towards waste. The value of knowing the ultimate goal is enormous – a confused strategy with contradictory targets and goals is a major block to getting the most out of the waste stream.

This report seeks to clarify what the goal of waste policy should be, by balancing the three principles outlined previously: an environmentally acceptable, economically efficient and user-friendly service. In practice it is not simple to balance these sometimes conflicting demands. The environmental standards and needs of householders will shape how the economic incentives are played out, and thus what system emerges over time.

Defra's waste strategy aims for "one planet living" as the overall policy goal, and suggests a combination of waste reduction, increased recycling and reuse and energy recovery to get there.⁷ What this does not spell out exactly is the overall goal of waste policy. Should we be seeking to minimise landfill or carbon emissions? Or to maximise the economic benefit from a well-designed resource management system? Or reduce our use of scarce materials? Waste policy as a whole has tended to focus far too much on means and too little on ends.

“ There are three key goals in waste: environmental protection, economic efficiency and quality of service ”

The goals of waste policy

There are three key goals in waste: environmental protection, economic efficiency and quality of service. The right service will maximise the quality of collected materials for recycling or energy recovery while not placing excessive demands on householders or costing too much.

The impact of waste policy on the environment is usually the starting point for deciding what to do with what we throw away, yet any changes to waste policy impact on businesses and homes as well as on other policy areas such as transport, local government and energy. To achieve optimal outcomes from any system it is important to recognise that designing waste services is not an exact science and that the balance between the three will vary in different places.

Defra's "waste hierarchy" ranks the options for dealing with waste in a sensible order, preferring waste reduction and re-use to recycling, before turning to energy recovery and finally landfill.⁸ What this hierarchy does not show is how much one is to be preferred to another – is energy recovery only marginally less attractive than recycling or is it only slightly better than landfill?

⁷ Defra 2007, op cit

⁸ Ibid

What should we recycle and why?

Balancing environmental, economic and service needs should be used to determine what is worth recycling and what is not. There are some materials, for example paper, which have well established recycling markets where substantial energy savings are made from recycling. Most materials can be recycled and, if there is an environmental case, an economic solution will often be found, usually because the major saving is in the difference in energy required to make new or recycle.

The key question is not necessarily what to recycle, but how. Some materials, such as cans and paper, are fine to collect together, being easily separable by automatic means. Some, such as plastic are harder to extract value from but are still worthwhile, especially as infrared technology can sort it increasingly accurately. Glass is very dependent on how it is collected for its value; mixed, broken glass is much less valuable than separated bottles which can be re-used or melted again.

Any waste strategy is inevitably going to involve some trade-offs. Getting the most value out of waste conflicts with environmentalists who oppose EfW plants, while maximising recycling can increase the demands on some householders' time, space and effort unrealistically.

Peterborough's approach

Peterborough City Council has set itself highly ambitious targets when it comes to waste, aiming for a 65% recycling rate which is well above the national average of 35.5%.⁹ In addition, it is developing an EfW plant to deal with the rest of the waste, massively reducing the amount sent to landfill. In spelling out its plans the council follows the waste hierarchy closely, seeking to maximise recycling before considering "what we do with the rest of our rubbish."¹⁰

This approach specifies the means without necessarily making the ends clear. While this is not catastrophic, national policy needs to be clear about why certain goals are selected and how they are ranked by preference. The environmental outcome is the prime concern, not local councils' recycling league table ranking.

Targets and measurement

"Too often the reason for targets is forgotten in the preoccupation to achieve them."¹¹ The Welsh Assembly Government sums up much of the problem with waste policy in this single sentence. The mass of targets and incentives makes it clear that rather than a well-organised, overarching set of goals waste policy is all over the place.

Different actors are measured on different targets and standards. District councils have a tonnage target to meet whereas county councils are exposed to the landfill tax and the landfill allowance trading scheme (LATS). Individuals have no discernible incentives at all beyond doing the right thing, and businesses are being engaged in an ad hoc, sector-by-sector approach.

How to measure the environmental impact of waste is similarly unclear. Tonnage targets have tended to predominate because they are simple, although these have perverse effects on what is collected, with heavy waste preferred to lighter waste that

9 "Municipal Waste Management Statistics, Provisional Quarter 1 2008/09", Defra

10 <http://www.65percentplus.co.uk/What-we-do-with-the-rest-of-our-rubbish>, Peterborough City Council

11 "Future directions for municipal waste management in Wales – proposed targets and actions", Welsh Assembly, 20th January 2009, p2

may have more severe environmental impacts: compare garden waste and batteries.¹² There has been major growth in collections, with the total tonnage of garden waste collected increasing nearly 20 times from 156,000 tonnes in 1995-96 (England and Wales) to nearly 3 million tonnes in England alone in 2006-07. In the same period, glass and paper tonnages have roughly tripled.¹³

There have been suggestions that measuring the greenhouse gas (GHG) emissions of waste would provide a better metric because it would directly measure its impact on climate change. However, the difficulty of pinpointing where emissions are created, as well as calculating the carbon emissions across the whole life cycle of a product, may make this impractical.

Different measures can easily conflict. If maximising the recycling rate leads to transporting waste such distances that the GHG emissions outweigh the savings, there will be a conflict with a goal of minimising emissions. Trying to recycle as much as possible might conflict with maximising the quality and profit from recycling, deterring investment. Consistency in measures and incentives is important if a clear, well-organised system is to emerge from the chaotic jumble of measures, targets and incentives currently in place.

“ There has been major growth in collections, with the total tonnage of garden waste collected increasing nearly 20 times from 156,000 tonnes in 1995-96 (England and Wales) to nearly 3 million tonnes in England alone in 2006-07 ”

Environmental standards

For every process in waste there will be strict standards applied, either from European Union legislation or national policy administered by the Environment Agency. For example, the waste incineration directive seeks to eliminate or minimise the effects on air, soil, surface and groundwater as well as human health from incineration.¹⁴ The Environment Agency monitors emissions from plant in England and Wales and takes action where necessary if the standards are breached.

These minimum standards should rise over time, so new plant has to be more efficient or older plant updated. Waste incinerators either had to close or upgrade due to the 1989 waste incineration directive, and power stations face a similar tightening of standards over the coming decade.

New technologies will require new environmental standards. Establishing what can be done with by-products from processes such as AD will be important, both to establishing markets in those which can be used and also in designing processes to minimise harmful side-effects.

This approach is being followed by the Environment Agency and WRAP (the Waste and Resources Action Programme). Their joint waste protocols project is setting out quality protocols to encourage the development of markets in resources recovered from waste, enabling more efficient use of those materials.

Getting the incentives right for a clear goal

Currently, waste policy is centred on different targets for each actor. In recent years, it has focused on landfill diversion and increasing recycling rates, achieving some

¹² Batteries will be covered by the European batteries directive, which will require retailers (except those who sell less than 32kg of batteries in a year) to take back used batteries free of charge

¹³ Data from <http://www.waste-dataflow.org/> and Defra Municipal Waste Management Statistics

¹⁴ “Environmental Permitting Guidance – The Directive on the Incineration of Waste”, Defra, 2008, p5

success in this. However, less progress has been made for unrecyclable materials or C&I waste, which still tends to go to landfill more often than municipal waste.

A clearer sense of direction is needed. Waste is a complicated area where too many authorities are chasing too many divergent targets. Simplifying the governance of waste and reducing the complex mess of targets is crucial. But so is a clear idea of the overall aim: waste services which minimise environmental damage, maximise resource and economic value recovered through recycling or energy, and provide simple, reliable services to householders. This meets the “triple bottom line” of social, environmental and economic measures at the heart of sustainability.¹⁵

¹⁵ Elkington J, op cit

2

Local government's key role

Recommendations

Abolish the present waste collection and disposal authorities and create single-tier waste authorities in England. By simplifying local governance of waste in many areas, clear incentive structures can efficiently bind in the key actors in the waste system: households, local government and the waste industry. This can also save money.

Abolish recycling tonnage targets for local government. Tonnage targets lead to collecting materials of marginal environmental and economic benefit. Abolishing National Indicators 191, 192 and 193 will, in combination with the new single tier authorities, focus waste services on achieving their environmental, economic and social goals.

The mess of targets and incentives

Table 1 shows the array of incentives and targets that local government face. These fall into two groups: financial incentives for waste disposal authorities and National Indicators (NIs), which measure the amount of waste collected by waste collection authorities, what proportion of that is recyclable or compostable and how much is sent to landfill. The problem with the NIs is that they provide an incentive to maximise how much is collected for recycling and composting, but not to design the best recycling system or produce the best outcome.

Table 1: Current targets/financial incentives

LATS	Landfill Allowance Trading Scheme
Landfill Tax	Landfill Tax
NI 191	Residual household waste per household
NI 192	Household waste reused, recycled and composted
NI 193	Municipal waste landfilled

While the NIs may prove better than the system they replaced, they still encourage authorities to collect materials to hit targets rather than because of their environmental impact or economic value. Glass and garden waste are an easy win for collection authorities but a problem for disposal authorities. Collection

authorities are in a position to shape disposal authorities' activities yet they have little responsibility to deliver the best waste streams for meeting the financial incentives which come into play in disposal.

MRFs: Where perverse incentives run riot

Material recovery facilities (MRFs) are places where disposal authorities separate recyclables which have been collected together. They are usually operated by a private company on a long-term contract with a disposal authority, often under a private finance initiative. MRFs bear the brunt of collection authorities' preferences for heavy recyclates over environmentally worthwhile ones by having to deal with materials that should not be collected together. While some can separate glass by colour and quality, the problems that can occur are a good example of design of collection and processing not matching.

MRFs also operate their own perverse incentives. They have two sources of income: gate fees for incoming waste and selling on of outgoing materials. The more waste they can put through, the more income from gate fees, yet the less they put through the higher the quality of the outputs. Because councils are led by tonnage targets, and because the waste counts as recycled once it arrives at the MRF, there is no incentive for them to ensure quality, while the MRFs have conflicting incentives to charge as many gate fees as possible and to make as much money from selling on the reprocessed waste.¹⁶ This can be avoided by setting the right contracts between the disposal and collection authorities and the MRF operator, to incentivise quality rather than volume.

Separate responsibilities

In May 2006 there were 273 waste collection authorities at district council level, 40 waste disposal authorities, covering county councils as well as areas such as Merseyside and Greater Manchester, and 81 unitary authorities which fulfill both functions.

Under the present arrangements, collection and disposal are provided by different bodies in areas where there is a two-tier local government structure. The major problem with this separation is that the incentives faced by the

waste collection and disposal authorities do not match. Waste collection authorities are measured by the percentage of recycling separated from their waste, while waste disposal authorities are directly affected by the financial instruments (landfill tax and

LATS) used by government. These do not necessarily correlate, especially if heavy materials are less financially viable than lighter ones.

Getting different local authorities to work together is crucial to achieving the best outcome in waste. The outstanding example of local authorities successfully collaborating is Project Integra in Hampshire. By binding all the local authorities in the county into one organisational structure collection and disposal responsibilities have been aligned with the result that new infrastructure can be financed effectively and significant economies of scale achieved.

“ Getting different local authorities to work together is crucial to achieving the best outcome in waste ”

16 "Quality Standards and Efficiency: An International Perspective" presentation from Materials Recovery Forum, WRAP, 8th November 2006

Project Integra

The collaboration between Hampshire County Council, the 11 district councils in the county and the two unitary authorities of Southampton and Portsmouth, is the most prominent example of successful co-operation among local authorities. It was founded in 1994 to deal with the county's rapidly diminishing landfill capacity.

The strategy was to invest heavily in infrastructure to divert waste from landfill. This included significant use of energy from waste, through three energy recovery facilities, as well as driving up recycling rates and focusing on waste minimisation. In 2006-07, 37.2% of waste was recycled with 49.9% of waste which could not be recycled used to recover energy.¹⁷

Project Integra is notable not only for its impressive reduction of landfill but also for the way all the local authorities in the county co-operated with private partners to develop significant infrastructure which would have been beyond their separate capacities.¹⁸ It worked because it was genuinely co-operative, with councils working together and thinking strategically about how to best meet the shared challenge of running out of landfill capacity.

To clarify incentives and structures, it is necessary to reform the relationship between local government and waste. This report recommends replacing waste collection and disposal authorities with single-tier waste authorities and redesigning the incentives faced by the new bodies. This would clear away the anomalies and complexities of waste as it stands and replace them with a clear vision, framework and structure. Abolishing tonnage targets along with waste collection authorities would remove a major perversity in the system as well as promoting economies of scale.

Sorting out the rather confused governance structure in waste is a vital step towards achieving the optimum service under the three guiding principles. The consistent incentive structure discussed above will be best served by institutions designed to achieve the goals set, rather than the present set up of separate bodies with different goals. Waste collection authorities' responsibility to local householders needs to be connected directly with waste disposal authorities' wider responsibilities to taxpayers and the environment. Establishing a direct link between the two under one institution would gear the whole service towards a common goal, bringing in private sector partners and households as well. Balancing economic and environmental concerns within constraints set by households is difficult for a single body, but it is beyond the capability of a messy set of overlapping authorities with different goals.

Joint waste authorities have been proposed by the present government, although with fairly limited take up. Seven groups of authorities, mainly comprising unitary or district authorities, have expressed an interest in forming joint waste authorities.¹⁹ London has long had merged waste disposal authorities covering Western, Eastern, North and West Riverside areas. These are well-established, and represent a good model for borough council level formal co-operation. The benefits of working together are significant. The LGA estimates that savings in the region of £150 million could be delivered for local authorities, as well as improving certainty for contractors.²⁰

17 <http://www.integra.org.uk/stats.html>, Project Integra

18 "Working together on Waste", Local Government Association, 2008

19 "List of authorities who submitted an Expression of Interest in making a JWA proposal in 2008/9", Defra; <http://www.defra.gov.uk/environment/waste/localauth/partnership/documents/jwa-la-interest08.pdf>

20 Local Government Association, op cit, p3

This report's proposal to abolish waste collection authorities and produce single-tier bodies covering larger areas essentially pushes joint waste authorities much further. To get the economies of scale for infrastructure and to drive standardisation, joint waste authorities are essential.

Forcing authorities to merge is politically fraught, as Ken Livingstone's attempt to do so in London demonstrated (see below box). It needs to be clearly explained and not used to grab power. Forcing authorities to merge will require some political courage but will produce a much better outcome without removing democratic oversight.

London Single Waste Disposal Authority (LSWDA)

Former mayor Ken Livingstone called for a single waste disposal authority to replace all of the existing waste authorities. He argued that London's recycling rates were too low and that the only solution to this was for the mayor to effectively take over waste disposal.²¹

This was comprehensively resisted by the boroughs. Bromley, for example, argued that "the Mayor's proposal introduces an additional layer of bureaucracy (and thus cost) into the current system with no quantified financial benefit."²²

The proposal was rejected by Environment Minister Ben Bradshaw, largely on the grounds of cost and diversion of effort already underway.²³ Ironically, the proposal to merge waste under the mayor's auspices succeeded in forcing collaboration among councils – in effective opposition to the proposal.

The proposal for a single waste authority failed due to significant hostility from the boroughs and lack of evidence to support it. The importance of autonomy to local authorities means that they will often resist attempts to remove their powers in a highly visible public service.

Major processing facilities such as EfW, MRFs or AD require economies of scale to operate and, in particular, to finance their construction. Waste disposal authorities and county councils often have the size to develop infrastructure, such as in Staffordshire where there are plans for a second EfW plant, although this plan has relied on Walsall, Sandwell and Warwickshire to ensure adequate tonnages will be available.²⁴ By contrast, unitary authorities may be smaller and not have the scale for such capital-intensive investment. This is where co-operation among local authorities comes into play. A lack of co-operation can increase uncertainty and thus raise the potential costs of investment.

Planning

Delivering new infrastructure requires planning permission. Local government is central to this process, as the arena in which local residents can object to developments, as well as the body which grants permission for facilities to deal with its waste responsibilities.

Waste processing facilities are often seen as big, smelly and disruptive. In a recent survey, public approval of waste facilities was lower than for supermarkets (-53% compared to -14%), and similar to industrial development (-55%). Only quarries, power stations and casinos were found to be significantly less popular.²⁵ Regional differences were evident for planning in general, with better off regions significantly more likely to be opposed to development than poorer parts of the UK.²⁶

21 <http://www.london.gov.uk/mayor/environment/waste/lswa/index.jsp>

22 "Review of GLA Powers – Summary of Waste Issues", Bromley Borough Council, p2

23 "Environment Minister rejects calls for a single waste authority", London Councils <http://www.londoncouncils.gov.uk/media/current/pressdetail.htm?pk=148>

24 <http://www.staffordshire.gov.uk/news/fourashes2.htm>

25 "2009 Saint UK Index – Headline Results", Saint Consulting Group; <http://tscg.co.uk/survey/summary.html>. Figures are % approving such a development, % opposing it

26 *ibid*

Securing planning permission for large waste infrastructure is a major challenge. As the experience of the incinerator now being built at Belvedere shows, it can be an agonisingly slow process full of political difficulty. Finding suitable sites, receiving planning permission, getting local acceptance of new infrastructure and then financing its development are all difficulties facing local authorities and the waste industry.

Planning nightmare: Belvedere's 12 Years²⁷

Cory Environmental's Riverside Resource Recovery Facility at Belvedere on the south bank of the Thames in Bexley illustrates the obstacles to developing large waste infrastructure. It is being built on the site of previous industrial development and is next to a sewage treatment plant and a sludge incinerator. This should be an optimum site, with no nearby residential development and a riverside location that allows waste to be shipped in by barge, minimising road traffic disruption.

Plans for the plant currently being built were submitted in 1999, although an earlier proposal was made in the mid-1980s. Opposition from Bexley council, the former Mayor of London and local groups resulted in a lengthy public inquiry. Permission was finally granted in 2006, although a legal challenge by the mayor and two judicial reviews delayed it until February 2007. Construction is expected to be complete by mid-2011, 12 years after initial planning proposals were submitted. The element of planning risk for such projects is enormous: Cory Environmental and three financial institutions have invested £550 million and funding was finalised only in 2008.

One senior executive from a waste company drew attention to the changing nature of objections to waste infrastructure. These used to be based on emissions and smells but are now largely focused on traffic. Waste facilities such as EfW plants or large recycling centres are quite similar to industrial development, which few would choose to site in residential areas.

However, facilities to process municipal waste have to trade off minimising the distance travelled by the waste against residents' opposition to having a large plant located in their neighbourhood – many people would rather ignore the fact that it also provides a public good.

Site selection was highlighted as the most important factor in gaining planning permission by experts and industry figures. Good site selection should optimise the trade-off between proximity to waste and distance from residential areas. This is even more the case when considering any plant with combined heat and power, which relies on nearby uses for the heat generated. Good design, in particular with regard to traffic flows, is essential to get a project through planning, while architecture of new plants has been radically improved.

The other consideration, which also affects finance, is technology choice. One interviewee said proven technologies are much more likely to gain approval because of risk aversion on the part of councils. This is also widely held to be a problem with financing, because of the risk attached to new technologies or those not developed to scale.

The Planning Act and waste

The Planning Act 2008 reformed the way in which big national infrastructure projects are granted planning approval. Waste facilities have a slightly ambiguous position

²⁷ All information from <http://www.coryenvironmental.co.uk/page/RRRcasestudy1.htm>

in the Act, being excluded from the specific list of projects that can constitute such infrastructure but included in the areas where the Secretary of State may order that a project be listed.²⁸ This could apply to waste infrastructure above a certain size, for example, or a network of infrastructure. Electricity generation above 50MW is included in the definition, meaning that a large EfW plant would fall under this definition.

Interestingly, most interviewees were not keen on the idea of using National Policy Statements under the Planning Act. They felt that the current system was adequate: it required them to engage local opinion thoroughly and, most important of all, design and locate the proposed facilities well. Given that waste infrastructure is generally much closer to residential areas than power stations or gas pipelines, the need to gain local support is important. The Community Infrastructure Levy, which replaces section 106 agreements in planning, will formalise the trade-off process by paying for other facilities for local residents as part of the planning permission. Using the Planning Act as a sledgehammer to crack the nut of local consent is not attractive for an ongoing service paid for by local taxpayers.

Planning is a sensitive subject, and has recently been reformed. Because of the importance of local consent this report does not recommend making it easier to railroad through waste infrastructure. Including waste in the Planning Act list of projects may be necessary in the future but as yet the case is underwhelming.

The key role of local government

Councils, whether alone or in co-operation with each other, can have a vital strategic role to play. There is also potential for regional leadership. The West Midlands Regional Development Agency, for example, is running an innovative project to identify potential sites for waste infrastructure. They are judged on a range of criteria, such as prioritising sites close to existing points of high demand for energy or fuel. Rather than detailed micromanagement from Whitehall, setting up a framework and allowing the private sector and local authorities to deliver solutions for their area presents an opportunity to find exciting new possibilities in waste.

London Waste and Recycling Board (LWaRB)

Boris Johnson, Mayor of London, launched the London Waste and Recycling Board (LWaRB) in September 2008. It differed from the previous proposals for a single waste disposal authority by bringing in the boroughs rather than seeking to take over their powers in waste. Its strategic approach identified and ranked priorities for processes and materials.²⁹

The board has a £84.4 million fund to cover the period to 2012, to spend on research, funding facilities or services.³⁰ Its first tender for projects attracted 142 expressions of interest, which according to one source were of greater value than the entire fund.³¹ The board has now planned to seek extra match funding from European sources to take advantage of the obvious potential demand for support.

The LSWDA and LWaRB demonstrate the importance of getting the politics and organisation right. That the LWaRB has seen considerable success so far is largely down to its strategic-level approach, which was developed with the boroughs, unlike the attempt to merge waste under City Hall. By setting an appropriate framework and making funds available for well-designed projects, the LWaRB has demonstrated the potency of the private and community sectors.

28 Planning Act 2008, 14 (3)

29 "2009/10 Business Plan", London Waste and Recycling Board, 2009, p10

30 *Ibid*, p8

31 London Waste and Recycling Board; <http://www.londoncouncils.gov.uk/Transport/lwarb/londonwasteandrecyclingboardwelcomeshugeresponsetofunding-call.htm>

3

From waste disposal as a public service to a resource management system?

Recommendation

Commercial and industrial (C&I) waste from small businesses should be integrated with municipal waste. Throughout most of Europe, commercial and industrial waste similar to household waste is included in the definition of municipal waste. Reforming the legal definition in the UK would increase the economies of scale for local government and the private sector to invest in waste infrastructure. This change should be introduced over time with an opt-out for an introductory period to smooth transition from contracts already signed.

Abandoning the waste disposal paradigm

Waste disposal is a mindset and one that is deeply ingrained in present infrastructure and practice. Councils have long had a duty to collect and dispose of waste, and this is still the case in law: councils are either waste collection authorities, waste disposal authorities or, in the case of unitary authorities, both.

A shift from waste disposal as a problem, where the emphasis is on the best way to get rid of waste, to resource management is essential. Resource

“A major problem is the term “waste” itself”

management focuses on making the best and most efficient use of materials over their lifespan. This would achieve better results for the environment and have a beneficial economic impact through developing new industries and recovering valuable resources that we currently discard.

A major problem is the term “waste” itself which is enshrined in legislation as “any substance or object... which the holder intends to throw away.”³² The 2008 revised waste framework directive retains the original definition of waste because a series of European Court of Justice rulings have made it difficult, if not impossible, to change it.

The EU has, however, attempted to clarify when certain types of waste can be regarded as non-wastes. This includes the identification of by-products and “end-of-waste status”, which is when a recovery operation has taken place turning the waste into a resource. The waste protocols project is seeking to do precisely this,

32 Directive 2006/12/EC of the European Parliament and of the Council, 1(a)

finding ways to reclassify wastes as by-products which can then be used in other processes.³³

The current waste disposal paradigm sees waste as a problem to be solved. Decisions made long before recycling, resource scarcity and climate change rose up the agenda have shaped the waste infrastructure the UK has today. Systems have been built for waste disposal, not resource management. Similarly, how households and businesses deal with their waste has been learned over a long time and can be hard to change.

A paradigm shift is needed to focus on resource management rather than waste management, and develop policies to tackle the whole resource chain from initial design through to recycling, reuse or disposal. Waste prevention starts with resource choice: choosing less hazardous waste to make goods and choosing fewer and less hazardous resources overall. The next step is resource efficiency during the manufacturing process, and this may involve using fewer resources per unit of output or using less energy. Finally, there is a need to recognise wastes as resources in the wrong place, in the wrong quantity and of the wrong quality.

Resource management's potential

Resource management is an explicit rejection of the idea that the cheapest approach is always the best, and of its opposite that environmental concerns always override economic ones. Landfill used to be cheap and have few apparent environmental drawbacks. Now that it is seen as environmentally unacceptable, the price has been raised, changing its previously favourable position.

The interaction of economic and environmental benefits from this shift highlights the need for “a proper market for materials.”³⁴ This involves the private sector maximising value within government-set environmental requirements and tax framework. The different actors all operate to balance the three guiding principles, with the government setting demanding environmental standards but letting the private sector innovate with local authorities to deliver a user-friendly service with maximum economic value.

A resource management economy has the potential to combine the benefits of effective use of materials with the potential for substantial economic development in associated industry. Presently, large amounts of potentially valuable resources are disposed of, with costs for all concerned. By establishing favourable conditions for an industry to grow and extract value from this at a profit, the environmental benefits of avoiding waste will be matched by economic benefits of job creation, profit and development.

The drawbacks of the waste disposal mindset, and the framing of waste policy in terms of avoiding landfill, is reflected in the treatment of glass. If there is a preference established to do anything other than landfill, perverse effects can come into play. The potential uses of glass include those which are entirely worthwhile, such as closed-loop recycling back into glass for packaging, the most energy efficient option. Glass is also used as road aggregate, which takes 15% of recycled glass mainly made up of lower quality collections that cannot be used for more valuable products. In terms of GHG emissions, this is actually worse than disposing of the excess glass in landfill,

³³ “Waste Protocols Project”, WRAP; http://www.wrap.org.uk/manufacturing/projects/waste_protocols_projects/

³⁴ “How to Deliver a Resource Management Strategy”, Institution of Civil Engineers and Institution of Mechanical Engineers, 2007, p1

producing two kilograms of carbon dioxide equivalent (CO₂e) more per tonne.³⁵

Perverse incentives

Why have we not already shifted away from a waste disposal paradigm to resource management? The imperative to reduce landfill is relatively recent and, with waste infrastructure geared to disposal, the treatment of recycling as one more method of waste disposal is understandable. It also reflects the role of local councils, which historically have been responsible for disposing of waste and must now meet recycling targets transposed from European directives.

Contracts, infrastructure and habit are all established in a waste disposal programme. The legal description of waste disposal authorities clearly embeds the idea that their job is to dispose of waste, not to extract maximum value from the materials we use. Tied to this is the effect of the incentive structure involved in recycling. District councils are subject to considerable pressure to recycle as much as possible, more as a part of the dash from landfill than an attempt to reach an environmentally and economically efficient approach to material use. This is reflected in their tendency to be prescriptive in tenders for collection but less so for disposal.

A resource management approach to improving quality would take several steps. Increasing separation before processing should drive up quality and thus resale price. Changing the incentive structure on local authorities to reflect the value of material extracted from waste rather than the tonnage delivered to MRFs would have a huge effect on how waste is collected and processed.

Recycling is, other things being equal, a good thing to do with materials that would otherwise be wasted. However, to be a rational, long-term solution, recycling needs to be part of the wider economy on its own merits rather than a response to a government drive to reduce landfill. A “proper market in materials” is not the same thing as a flight from landfill driven by government targets. Developing closed-loop recycling systems within the UK will be an important part of the low carbon economy, and presents a major opportunity for new jobs and opportunities.

The premise that resource management can flourish in a proper market raises the question of the role of government. A proper market would not rely on recycling targets, currently one of the Government’s preferred tools to drive up landfill avoidance. Environmental regulation is inevitably central to the shape of the market, because the environment is a public good.

The other tool to create and shape the resource management economy is tax. Governments tax a wide variety of things, and can use the tax system to encourage some behaviour over others as well as simply to raise revenue. By placing a value on materials, or a cost on processes with damaging environmental outputs, governments can shape markets. The example of Flanders, discussed in the box below, shows the potential of using the tax system to send clear signals to local government and private sector partners.

By setting the right incentive framework, government can let the actors who actually serve the customers decide on the most appropriate solution in each case, on its merits. Financial incentives leave much more scope for innovation and choice than straightforward targets.

35 “The case for a resource management strategy”, Institution of Civil Engineers/Institution of Mechanical Engineers, 2006, p10

The Case of Flanders

Flanders in Belgium imposed taxes on landfill and EfW, to encourage recycling; landfill is taxed at a higher rate as the least desirable option. Flanders has 22 different taxes covering different products and disposal methods.³⁶ For example, landfill for recycling residues is taxed at €7.73/tonne and landfill for household waste on a “bog standard” site at €61.82/tonne.³⁷ The level of detail in the Flemish taxes may seem overly complex, but they make very clear which practices are approved of.

Flanders also offers a range of practical solutions to minimising waste, all based around price. They have established a chain of “re-use” centres, where disposed of white goods can be repaired and sold at a price below the cost of scrapping them. Flanders’ recycling rates are a very impressive 73%.³⁸ This is a long way ahead of England, where leading district councils have achieved about 55% of municipal waste.³⁹

In addition to price signals through taxation, Flanders charges households different tariffs for different wastes. It has also gone as far as to ban landfill or incineration of some waste. As well as giving a financial incentive to sort waste the tax system overall encourages waste reduction, enabling Flanders to improve its waste, recycling and energy recovery system significantly.

“ Flanders has 22 different taxes covering different products and disposal methods ”

Taxes and payments are very different ways to pay for services. By their very nature taxes are political, and council tax is notably controversial. The lack of

a clear link between the tax paid and the service provided is a problem in a utility-like service. Direct charging requires an element of personal responsibility and the financial implications of that include the ability to cut your bill through recycling.⁴⁰

Commercial and industrial waste

Waste services for the commercial and industrial (C&I) sector are provided by private contractors who collect and deal with waste from each business individually. While some of this waste (chemical, construction etc) is very different from household waste, the reason for separating commercial from household waste when they are compositionally similar rests only on historical practice.

Small businesses (SMEs) in particular might benefit from local councils taking over their waste in many cases. By merging the two, councils would achieve greater economies of scale and be forced to plan for commercial waste. At present councils often try to avoid taking on waste from this sector, seeing it largely as a cost. By placing a duty on them to collect commercial waste from small businesses at a comparable rate to households, councils will enter the market properly. As businesses will have existing contracts, they should be able to opt out if they so wish.

Integrating C&I and household waste over time should yield efficiency savings, although the different types of contracts mean that substantial changes in how household waste is paid for and collected would be necessary to achieve a single market. Redefining municipal waste to include business waste similar to household waste would be a small change with far-reaching effects by eroding the barriers between these two segments of the market.

36 OECD/European Environment Agency database on instruments used in environmental policy, <http://www2.oecd.org/econinst/qseries/index.htm>

37 “Belgium Ecotax Rates”, in *Green Budget Germany*, FOES, 2009, p9; <http://www.foes.de/pdf/Belgium%20Ecotax%20Rates.pdf>

38 “An International Survey of Zero Waste Initiatives”, Green Alliance (not dated), p10

39 “English League Tables 2006/7”; <http://www.letsrecycle.com/councils/league/2006/index.html>

40 Berney M, Lummis D and Psaila M, “Direct and variable charging for household residual waste – an overview” Gordon Mackie Associates, for the Chartered Institute of Waste Management, 2007, p10

The role of business

While households are the ultimate users of products that end up as waste, the producers of those products have in recent years come under consideration. Consumers regularly point to the amount of packaging as a major source of waste and one that they find particularly hard to minimise.⁴¹

The EU recognised the importance of producer responsibility and packaging in the 1994 Packaging Directive. This introduced the idea of shared responsibility, with key sectors being allocated responsibility for their packaging. This was extended in 2004 and set higher targets for material recovery, and again with the Packaging Strategy launched by Defra in 2009.⁴²

The responsibility of producers to minimise waste is one part of the equation, and one many of them are taking seriously. Much pressure has been brought to bear on the supermarket sector to reduce packaging, with good results (see box). The other part is managing the waste derived from their products, which is an emerging area for producers of goods. Responsibility to take back waste from products such as packaging or the product itself at the end of its life are a potential growth area for resource management.

A special role for supermarkets?

A good example of the sector-by-sector approach is the Courtauld Commitment. This agreement between WRAP, the Government and major retailers has successfully tackled the growth in food packaging. In 2008 WRAP cited zero growth in packaging waste and has target to reduce it by 2010. It also aims to reduce food waste, again with a target for 2010.⁴³

Supermarkets have large amounts of food waste, such as food which is out of date that must be disposed of. One supermarket has announced plans to divert its food waste to AD, which produces methane that can be used to generate heat or electricity. This will reduce its landfill use by around 87 per cent.⁴⁴ The scale of supermarket businesses makes such in-house resource management viable. It could also be applied to the packaging of supermarket produce, which is often cited as a major source of waste that consumers are concerned about.⁴⁵

In addition to their producer responsibilities, supermarkets also occupy a potentially important place in household recycling. They already provide locations for recycling banks for items such as glass, paper and textiles in many store car parks. This enables them to fill gaps in kerbside recycling. Smaller items such as batteries which are not economical to collect separately at the kerbside could also be recycled through retailers, as happens in many European countries. With the inclusion of the deposit scheme for bottles and cans (outlined in *Litterbugs: How to deal with the problem of littering*), supermarkets would have a crucial role to play.

The combination of producer responsibility, legislation and market incentives could radically transform how producers of waste and retailers, in particular supermarkets, can contribute to reducing landfill. In the context of a market for high quality waste-as-resources, it is not just a matter of corporate social responsibility but one of profit.

41 "Food Behaviour Consumer Change: Quantitative Phase", WRAP 2007

42 European Parliament and Council Directive 94/62/EC of 20th December 1994 on packaging and packaging waste; <http://www.defra.gov.uk/environment/waste/topics/packaging/strategy.htm>

43 "Courtauld Commitment", WRAP; http://www.wrap.org.uk/retail/courtauld_commitment/

44 "Waste leads £30bn energy revolution", *Sunday Times*, 11th January 2009

45 WRAP, 2007, op cit

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Resource management: new markets

Recommendations

The landfill tax should be reformed into a broader waste tax covering all disposal processes in line with the waste hierarchy. The rates of this tax would reflect the relative damage done to the environment by different processes and incentivise reuse, recycling and energy recovery, including the separation of food waste where possible. By introducing taxation on incineration a clear preference is signalled to reduce, reuse, recycle or compost where possible. To limit uncertainty, escalating rates should be set over a long enough period to encourage investment.

Using waste to generate energy should become a central pillar of government policy in this area. This is currently underutilised in UK waste management. Energy can be extracted from waste through the anaerobic digestion of organic waste (principally food) to generate biogas and through the use of energy from waste (EfW). Both of these are a much better alternative to landfill for residual waste. EfW plants should include combined heat and power (CHP) where possible, so that sustainable, cheap and low carbon electricity and heating can be provided simultaneously for local communities. Together, these changes will help us to reduce our GHG emissions significantly and deliver increased energy security.

Green taxes, green markets

Tax is a powerful tool to shape markets. To do this, the government should set a tax and regulatory regime which clearly establishes preferences over how waste is treated and let the private sector deliver. This includes setting appropriate taxes throughout the waste hierarchy, with the highest rate for the least preferred option, landfill. The long term aim should be to divert waste from less-preferred processes to more-preferred ones, such as from landfill to energy recovery or from energy recovery to recycling.

By establishing this over a long enough term to bring certainty, the government would enable the private sector to respond to the signals given by the government through the tax framework. This has happened to an extent with the landfill tax annual Escalator but would be much more effective with more certainty over rates over the long term and without the complicating influence of two-tier authorities with conflicting or perverse incentives.

The landfill tax annual escalator appears to have been effective in diverting waste from landfill despite applying only to “active” waste, and thus being a rather blunt instrument. A restrained and well-designed reform of the landfill tax could maximise the potential of resource management. There would be benefits from disaggregating the rates different materials are taxed at rather than a blanket rate as is the case now. For example, landfilling leftover residues from recycling processes should clearly cost less than landfilling household waste directly. Given the damaging emissions from biodegradable waste in landfill, it would make sense to charge less to landfill collections which exclude food waste than those which collect everything. While some residents may continue to put food waste in their residual waste, this would create an extra incentive for separate food collections, significantly reducing the number of authorities collecting food waste in the residual collection.

Table 2 shows illustrative rates for a comprehensive waste tax based on 2013/14 Landfill Tax rates. This would be a suitable time to introduce the reformed waste tax because the landfill tax has not yet been set beyond it. This would give time for proper consultation and preparation.

By incentivising EfW over landfill, but still providing an incentive to recycle rather than incinerate, the tax structure mirrors the waste hierarchy closely. Introducing a tax on EfW should act as a clear incentive to recycle where possible but also provides a clear signal that energy recovery is preferable to landfill. This should be introduced at a low rate so as not to compromise existing projects. However, if EfW starts to impinge on recycling in the future the tax rate could be raised. This will be particularly relevant if landfill is successfully reduced to almost zero.

Table 2: Illustrative tax rates for waste treatments based on 2013-14 Landfill Tax rates

Landfilling unsorted waste	£70/tonne
Landfilling residual waste from rounds with separate food collection	£65/tonne
Incinerating unsorted residual waste	£10/tonne
Incinerating waste from rounds with separate food collection	£5/tonne
Landfilling post-processing wastes	£2.50/ tonne
Landfilling inert waste (i.e. construction etc)	£2.50/tonne

Bringing EfW within the scope of a reformed waste taxation regime is important because landfill may end up diverted to EfW rather than recycling otherwise. Given that in high-density areas much waste will continue to be collected weekly with little separation, generating energy from this waste is sensible and should be preferred to landfill.

Because EfW is eligible for Renewables Obligation Certificates (ROCs) when it has sufficient renewable CHP, and fits within the 2008 EU Waste Framework Directive of high efficiency, this tax would interact with the ROCs regime. This will encourage local authorities and businesses considering building an EfW plant to steer strongly towards CHP. It will also present a strong incentive towards the most efficient plants. Policy Exchange has recommended reform-

ing the ROCs regime due to its excessive complexity and cost, so the detail of the interaction between the waste tax and ROCs will need to be examined more closely.

The future of the landfill tax

The landfill tax was introduced in 1996, and has played a central role in driving change in the waste industry by raising the cost of landfill. In the 2009 Budget, the landfill tax escalator was extended, increasing at £8 per year up to 2013.⁴⁶ This is the rate it has increased by since 2007, meaning it will reach £72 per tonne in 2013. Giving a large financial incentive to divert waste from landfill appears to have worked with municipal waste: landfill rates have fallen sharply with the rise in the tax.

Because of the central importance of the landfill tax for investment decisions, there is an urgent need for certainty. The 2009 Budget extended the timeframe from 2010 to 2013, but given the lengthy process of gaining approval and building recycling or energy recovery plant, any new plants would be unlikely to be operational before 2013. If it is the case that a tipping point is soon going to be reached where further increases will have little effect, getting more out of the industry is much more difficult than simply extending the £8 per year rise. Similarly, if a more over-arching tax structure is to be used to replace non-financial

targets, any increase in complexity must be spelt out clearly and projected over the medium to long term.

As one senior executive put it, “landfill will always win” in the absence of a tax regime in waste, simply because the

infrastructure costs of alternatives are so high. By injecting a financial incentive into waste, the landfill tax has become the best tool available to government for shaping the waste industry and will continue to be so. The landfill tax is recognition that disposal is “the least desirable of the waste management options” and, by extension, that it gets less desirable over time.⁴⁷

“landfill will always win” in the absence of a tax regime in waste

Recycling markets

Recycling as part of this proper market must be economically as well as environmentally sound. During the early months of the recession, recycling markets were reported to have collapsed. The closure of 80% of China’s recycling industry in 2008 was taken as evidence that recycling was on the brink of collapse.⁴⁸ Confidence in recycling is easily undermined when it is done out of sight of householders who dutifully sort their waste and then read that it may nevertheless go to landfill due to the collapse of the market.⁴⁹

This panic over the viability of recycling is refuted by many in the industry. Discussions with the Environment Agency and Chartered Institution of Wastes Management revealed a much more nuanced picture, with well-sorted, high quality waste continuing much as normal but low quality waste struggling to find buyers except at near or below-zero prices. That the market appears to be returning to normal at the start of 2009 suggests that it is more robust than many commentators feared.

⁴⁶ Budget 2009, HM Treasury, p9

⁴⁷ “Modernising landfill tax legislation”, HM Treasury, 2009, p12

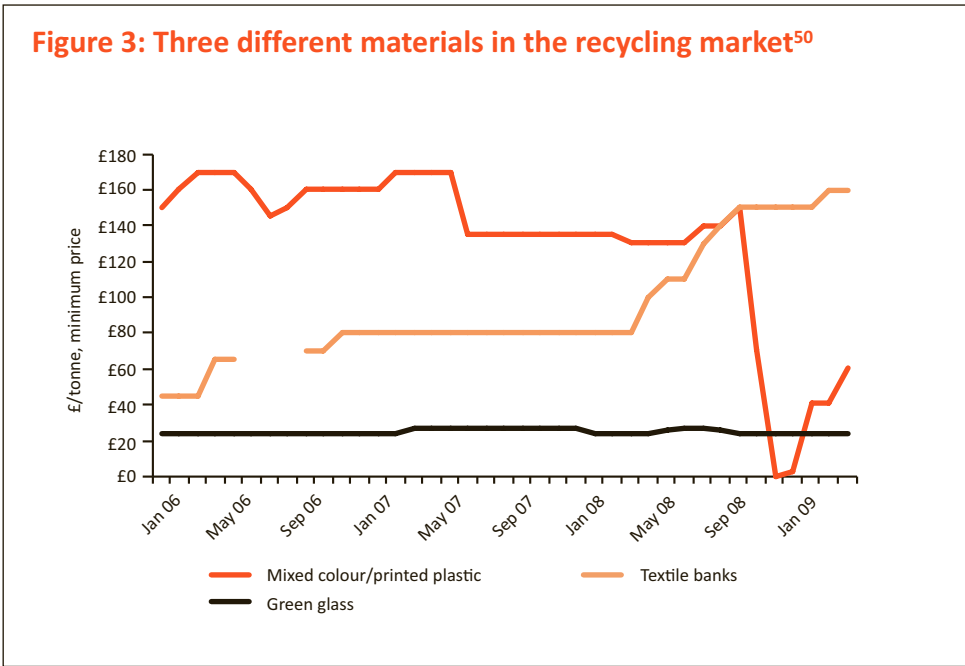
⁴⁸ Branigan T, “From East to West, a chain collapses”, *Guardian* 9th January 2009

⁴⁹ Hencke D, “Recycled waste could end up in landfill sites, warns watchdog”, *Guardian*, 14th January 2009

Not just one recycling market

Different materials have been affected differently by the recession. Recycling markets are very diverse, with different materials and categories of collections varying significantly. A good example is textiles: the price has increased fourfold since 2006 and has not dropped in a similar manner to other materials. This contrasts with mixed plastics, where the bottom fell out of the market at the end of 2008, followed by a small recovery in early 2009. Green glass, which unlike plastics is a largely domestic market, showed almost no price change over the entire period, never moving away from £24-27/tonne.

Figure 3: Three different materials in the recycling market⁵⁰



The three different materials show how claims that “recycling markets have collapsed” conceal more than they reveal. Export markets were hit harder than domestic markets, and the relationship between quality and price is crucial. Glass recycling is not dominated by exports, whereas mixed plastics largely go to Asia for reprocessing.

Government and market

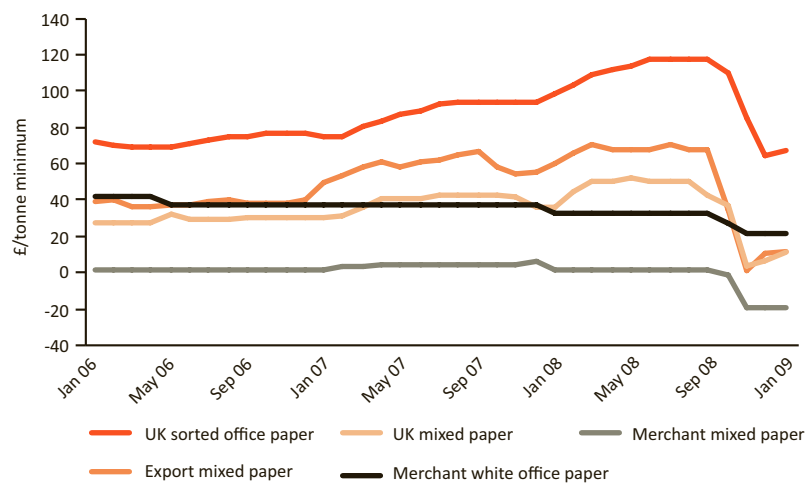
Central and local government have focused on recycling as the best way to reduce landfill, with significant increases in the recycling rate. However, this strategy has been exposed to a severe contraction in recycling markets, especially for materials which are largely exported. In searching for an economically as well as environmentally efficient way to get the most out of waste, relying on one industry is risky. The contrast between exported plastics and domestic industries such as glass also suggests that relying on export markets is a particularly fragile strategy.

⁵⁰ www.letsrecycle.com, missing data for textiles

Not just one recycling market

The Figure below shows the minimum price paid for different categories of paper in three different markets: UK paper mills, export and at merchant collection sites. While the trend in prices in the last quarter of 2008 is consistent, the extent of the plunge in prices is not. Sorted office paper for use in UK mills is clearly still attracting a good price; in fact it has not dropped much below its prices from only two years ago. By contrast, the mixed paper for export has suffered more. This emphasises the importance of collection and separation for the economics of resource management; higher quality, better separated materials are much more resilient than mixed or lower quality supplies.

Figure 4: Price for selected paper types in different markets⁵¹



Because the Government’s strategy for reducing landfill rests almost entirely on diverting waste to recycling, the market in recyclates is crucial. The severity and speed of the downturn in recycling markets is worrying because it exposes the fragility of the market and its dependence on exports, even if it was not as apocalyptic as reported.

Value through energy recovery

An often overlooked part of the waste hierarchy is energy recovery. For parts of the waste stream that cannot be recycled, either due to how they are collected or their content, energy recovery is widely seen as preferable to landfill. There are various forms of energy recovery, from well-established incineration to newer technologies, especially biogas derived through AD. Using food waste to generate a vital, scarce resource is incredibly attractive because it helps satisfy both waste and energy requirements.

Given the challenging situation the UK finds itself in with regard to energy, anything which offers a contribution to security of supply, decarbonisation and

⁵¹ www.letsrecycle.com

insulation from volatile global energy markets is welcome. The contents of our bins can make a contribution to reducing exposure to oil and gas price shocks and partially compensate for the decline in North Sea gas production. We can get a huge amount of value back from what we currently throw away.

The potential energy contribution of waste is not insignificant. The Institution of Civil Engineers estimates that 17% of electricity generated in the UK could come from waste, through a mix of incineration and reprocessing waste into Solid Recovered Fuel.⁵² While this is an optimistic estimate, this is potentially an important source of energy for the UK's future in a context of volatile gas imports, closing power plants and challenging renewables targets.⁵³

Although recycling will almost always offer a better solution for materials from a carbon and financial perspective, energy recovery is an important part of the solution for unrecyclable materials and collections. Many households and neighbourhoods will be unable to separate their waste, and this sort of waste should normally be incinerated rather than sent to landfill.

“ The Institution of Civil Engineers estimates that 17% of electricity generated in the UK could come from waste, through a mix of incineration and reprocessing waste into Solid Recovered Fuel ”

Energy from waste

EfW has been part of waste management for more than a century, yet remains very controversial. The first EU waste incineration directive in 1989 set tighter emission standards, leading to the closure of 29 plants by December 1996. Several, including Sheffield (see box) were upgraded to meet the new standards and a number were eventually built to replace ones that had closed, although no new incinerator was built between 1979 and 1994.

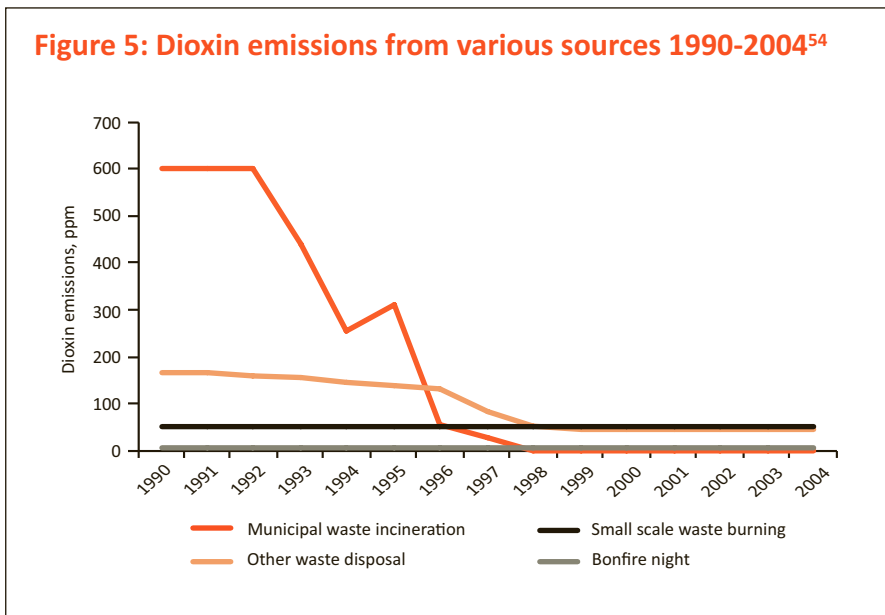
EfW: Sheffield

Sheffield has probably the most efficient incinerator in the UK, providing heat and generating electricity. The heat pipeline network was substantially extended after 1988 and supplies 140 buildings including two universities, a number of residential developments and public and private buildings in the city centre. The incinerator opened in 1975 but had to be upgraded after 1996 to meet the new emission limits under the waste incineration directive, reopening in 1999 with a capacity of 125,000 tonnes. In 2002 Onyx (now Veolia) won the contract to be the private waste management partner to the city and embarked on a new combined heat and power (CHP) plant adjacent to the old one. The new plant opened in 2007 with a capacity of 225,000 tonnes.

There is a perception that incinerators cause major emission problems, largely based on research into the older plants. But the reality is that incinerators now account for a small fraction of dioxins as shown in the following Figure. GHG emissions are, however, an issue with this approach.

⁵² ICE/Oakdene Hollins, op cit, p36

⁵³ Caldecott B and McIlveen R, *Knowledge is Power: Securing Transparency in Britain's Liberalised Energy Markets*, Policy Exchange, 2009



Currently in the UK there are 19 operating incinerators, with three under construction and seven granted planning approval. There are at least a further 30 proposed, mostly as part of PFI applications. Defra’s Waste Strategy for England 2007 projected that energy from waste would account for 25% of municipal waste by 2020, up from 10% in 2007, demonstrating the Government’s hope that this approach could complement recycling as a method of landfill diversion.⁵⁵ However, it is worth noting that in 2000 it was projected that EfW would account for 34% of municipal waste by 2015. Given that the proportion of waste sent for EfW has remained largely static (Figure 2) this is clearly not going to happen under the present policy regime.

Anaerobic digestion

AD takes organic materials and uses biological processes to convert them into methane, which can be used as a fuel, and digestate, which can be used as a soil conditioner or fertiliser. Historically, AD has been more common using agricultural manures and slurries, but in these cases the methane generation is relatively low due to the lower concentration of organic materials. More recently, AD has come to be seen as a technology to process food wastes.

There were 23 AD plants generating electricity in the UK in May 2008, most taking animal slurries, two taking household food waste and two taking food processing wastes.⁵⁶ As of 2007 planning approval was in progress for a further 25 plants using farm waste and 36 designed to take farm waste with other feed-stocks. Waste water AD plants number over 1,000, but only 13 of these use CHP. Commercial-scale projects are being rolled out (see box) and if successful could herald the much wider use of AD for municipal food waste.

Developing AD into a major part of the UK’s waste infrastructure will require further development and investment to make it commercially attractive above farm scale. £10 million was offered through WRAP in 2008, aiming to fund three to six plants under the AD Demonstration Program, which is being

⁵⁴ UK National Atmospheric Emission Inventory; www.naei.org.uk/

⁵⁵ Defra, op cit, 2007, p15

⁵⁶ “The evaluation of energy from biowaste arisings and forest residues in Scotland”, Report for SEPA, AEA Energy & Environment, 2008

jointly funded by Defra and DBIS through the Environmental Transformation Fund. In the 2009 Budget a further £10 million was announced to support businesses to deliver AD and in-vessel composting infrastructure to divert 316,000 tonnes from landfill, reducing government and business waste disposal costs.⁵⁷

AD: Sainsbury's and BiogenGreenfinch

In March 2009 Sainsbury's signed a deal with AD specialists BiogenGreenfinch to invest in a new AD plant being built at Westwood in Northamptonshire. The plant is expected to use about 45,000 tonnes of organic material a year as a feedstock to produce enough power for around 2,000 homes.⁵⁸

A Sainsbury's depot in Northampton is already sending small amounts of food waste to BiogenGreenfinch's existing AD plant at Twinwoods, Bedfordshire, on a trial scheme. The new Northamptonshire facility will take food from the company's Northampton distribution centre, which is linked to 38 stores, and will also be available to turn waste from Sainsbury's suppliers into energy.

The deal involves an undisclosed investment in the multi-million pound plant, which is now at an "advanced stage" of construction and will be commissioned in mid-2009. However, the supermarket is understood to have plans to invest around £9 million in up to five AD plants to realise its plans to cut its landfill use. The two companies said the deal was the first step in a planned joint venture that could involve similar projects elsewhere in the UK.

National Grid estimates the cost of establishing AD infrastructure to derive biogas from food waste as about £10 billion, in addition to the cost of new waste infrastructure which will be needed in any case. They also estimate that biogas could provide up to 50% of the UK's domestic gas needs, increasing energy security and reducing CO₂ emissions significantly.⁵⁹ This technology can satisfy energy and waste policy goals simultaneously at a profit.

“National Grid estimates the cost of establishing AD infrastructure to derive biogas from food waste as about £10 billion”

Advanced technologies

Beyond AD and EfW there are lots of “advanced” technologies which have yet to become established in the UK. These include pyrolysis/gasification, mechanical heat treatment, autoclaving and plasma arc gasification. In order to promote and demonstrate the potential of such technologies Defra established the New Technology Demonstrator Programme (NDTP) in 2003.

The projects involved in the NTDP are to submit final reports so that Defra can conduct a full assessment of the programme and the technologies involved. The intention was to fund ten projects and £30 million was made available. In the event, only nine projects were commissioned using £19.56 million of Defra funding. Of these, four were able to meet the contractual obligation to be operational for 8,000 hours, including two in-vessel composting facilities, an AD plant

⁵⁷ Budget 2009, HM Treasury, p148

⁵⁸ “Waste leads £30bn energy revolution”, Sunday Times, 11th January 2009

⁵⁹ “The Potential for Renewable Gas in the UK”, National Grid, 2009

and a mechanical thermal treatment plant. A further three facilities are operational, but have not completed 8,000 hours. Two gasification facilities were withdrawn from the programme.

Many of the companies involved in the NTDP have plans to build further plants, although the impact of the recession does raise the bar for investments with a substantial element of risk.

5

How to pay?

Recommendations

Itemise waste charges on council tax bills as a precursor to direct charging. Waste is politically controversial largely because of the council tax. Demonstrating the relatively small amount each household pays towards waste services in a similar way to police or fire services would enable a shift over time to direct and variable charging. This enables the use of incentives to encourage reluctant households to participate, embedding the householder in the incentive structure found in the rest of the system. Bringing much-needed transparency to how waste services are funded would enable taxpayers to hold their local authorities to account more effectively. Local councils should be free to offer incentives, discounts and other innovations in how waste is charged for, driving down costs and improving value for money.

Waste services are funded from local government budgets, and are therefore associated with the council tax. A shift towards a resource management economy would alter the economics and incentive structure of waste services if householders are brought along with the changes. This opens up the question whether council tax-funded services can be sustained in the future of waste.

The cost of waste management tends to be small when compared to those of education, health, the police and other social services. Government figures indicate that local authority spending on waste management (including recycling) increased slightly from 1.45% of total expenditure in 1999-2000 to 1.51% in 2003-04. It is estimated that local authorities spend £1.6-£1.8 billion on municipal waste management per annum.⁶⁰ This works out to around £100 per household per year for collection and disposal.

Resource management, tax and charges

Current debates over paying for waste tend to revolve around the council tax and suggestions to levy additional taxes or charges on households. This has generated controversy and opposition around the perception of charging as a stealth tax. The use of financial incentives has had strong effects on the behaviour and strategy of local authorities, resulting in a rise in recycling rates over recent years.⁶¹

The potential in a shift to a resource management economy is to get maximum value without having to rely on enormous financial penalties from Westminster

60 2003-04 figures

61 "Well Disposed: responding to the waste challenge", National Audit Office, 2008

or Brussels. The fear of a £150/tonne fine for waste exceeding a waste disposal authority’s landfill allowance is a powerful driver up to the point at which the council is within the allowance. However, once the target has been met the incentive disappears. While government could impose yet stricter targets, relying entirely on threats to local government does not appear to be a self-sustaining approach to reducing landfill.

Waste is in a slightly odd position compared to the other public services, which have been transformed into more market-like sectors. There is already thriving competition in waste, from compulsory competitive tendering. However, none of this is reflected in householders’ direct use of the service because it is negotiated with the local council.

The principle of transforming waste from a rigid, local council-contracted public service into a more flexible, market-orientated and innovative sector of the economy is one that is worth pursuing. Direct charging and incentives are extremely controversial for local councils, largely because people suspect that they are stealth taxes. Transparent and competitive pricing should be more palatable from companies or arms-length organisations such as Project Integra, if only because the prices are not imposed just as an opaque tax.

The impact of gate fees

All processing options involve gate fees, charged by facilities such as landfill sites or incinerators to take waste from collection services and which include taxes levied on waste. Gate fees for landfill, EfW, MRFs and other treatments differ significantly, driven by the tax regime and the value of the output set against the cost of the infrastructure. The cost of the gate fee is one of the main components of the overall cost of waste services and is passed on indirectly to householders and businesses.

Table 3: Typical gate fees for a variety of treatments⁶²

Landfill (inc landfill tax)	£60/tonne
EfW by incineration	£70-80/tonne
MRF	£21-28/tonne
In-vessel composting	£40/tonne
AD	£50-60/tonne

The gate fee for landfill is strongly shaped by the landfill tax, with an annual escalator adding £8 per tonne per year to the fee up to 2013. This is crucial to encouraging other processing options because the economic incentive is more direct, and probably stronger overall, than environmental goals. Given a gate fee for anaerobically digesting food waste that is lower than that for incineration or landfill, there is an incentive to separate out food collection, especially as it allows less frequent residual collections due to lower volumes of waste which does not degrade, roughly cancelling out the cost of the extra collection.

62 “Decentralised Energy: business opportunity in resource efficiency and carbon management”, UK Government’s Business Taskforce on Sustainable Consumption and Production, 2008; and “Comparing the cost of alternative waste treatment options”, WRAP, 2008

What role is there for bin taxes or some form of variable charging?

Defra's pilot of incentives demonstrated the limits of many forms of incentives, which often reward those who already recycle, leading to little extra recycling overall.⁶³ Financial incentives have been called for by the Local Government Association for several years, although this requires a change in legislation to permit discounts from council tax.⁶⁴ Such incentives would have implications for how local government is financed that go well beyond waste. However, allowing councils to innovate is vital to achieving the best service.

The suggestion that households should be taxed or charged for waste collection on top of their council tax is

one of the major reasons bin collection has become a politically controversial subject. Under the current system collection is paid for directly out of council tax and indirectly via general taxation; introducing charging would be equivalent to a tax rise which is, unsurprisingly, unpopular.

Populus, the pollster, has found scepticism regarding the motives for introducing green taxes – 62% of people believe that green taxes are designed to raise revenue rather than improve the environment. There was also concern about the impact of green taxes on the poorest – 69% agreed that green taxes would hit the poorest hardest while having little effect on the behaviour of the rich.⁶⁵ This might especially be the case for a service which has not been directly charged for before, with some people receiving the service without paying the tax.

Blaby District Council in Leicestershire is one of the few local authorities to have introduced a type of direct charging. It switched to wheeled bins in 2001, using powers under Section 46 of the Environmental Protection Act 1990 to charge for 140 litre wheeled bins for residual waste, together with a 140 litre green-lidded wheeled bin for recyclables on request (recyclables are collected on alternate weeks). If the residual waste wheeled bin is filled before the end of the week, households can buy refuse sacks from the council or have a 240 litre wheeled bin for an annual rental fee. Of the 37,550 properties served, only 7% were renting the larger bin or buying refuse sacks. During the first year the amount of recyclables rose by 55%.⁶⁶ This is an interesting hybrid of the traditional public service at a minimum level, plus a cost for further collection to discourage sending more waste to landfill.

The status of waste management as a public service, funded through local taxes for as long as it has existed, underpins all of the debate about direct, variable charging. The status quo has the effect of making charges for waste collection a form of tax, meaning that levying additional charges is effectively a stealth tax.

Direct, variable charging could be a powerful way to change behaviour. In some areas with low recycling rates it might be a very effective way to encourage people who would otherwise not recycle to do so. Its implementation would be easier if waste is itemised on council tax bills before the introduction of separate billing. To be successful, direct charges must be transparent and actually represent an incentive rather than an extra cost or tax. Local government should be free to introduce new incentives within direct charging, passing the benefits of more efficient services back to householders.

“62% of people believe that green taxes are designed to raise revenue rather than improve the environment”

63 Defra evaluation of household incentives

64 “Pay as you throw – financial incentives for recycling – get the facts”, Local Government Association; <http://www.lga.gov.uk/lga/core/page.do?pageId=300742>

65 BBC *Daily Politics* poll, Populus 2006; http://www.populuslimited.com/uploads/download_pdf-031106-The-Daily-Politics-Green-Taxes.pdf

66 ENDS Report 332, September 2002

Householders' responsibilities and expectations

Charging directly for waste services would change householders' interactions with the waste system. At present they have little choice over the service they receive or how it is funded. Unleashing the potential of householders as customers rather than taking the service they are given without question is potentially very powerful.

Different people will respond to different actions, with some needing reassurance that other people will also take part and others needing information or encouragement.⁶⁷ Social norms seem to be much more powerful than material

“ Defra's pilot study of incentives produced minor improvements at significant cost in many cases ”

incentives in encouraging recycling. Defra's pilot study of incentives produced minor improvements at significant cost in many cases.⁶⁸

Social responsibility is a major factor in recycling; people seem prepared to take responsibility if others around them do so too.⁶⁹ How to develop a sense of personal responsibility in areas where there is less social cohesion or the local environment is already compromised is a challenge. Giving financial incentives, such as in the RecycleBank scheme, is an approach that has not been rolled out on any scale in the UK but offers a way to bring people into recycling who presently are not doing it.

RecycleBank

RecycleBank is an innovative scheme in the United States which has recently been launched in the UK. It offers rewards such as shopping vouchers to households who recycle.⁷⁰ Interestingly, its use of chips in bins to identify the owner is central but relatively uncontroversial because it is linked directly to the rewards for recycling, in the form of discounts and shopping vouchers.

Recyclebank has begun a trial with Windsor and Maidenhead council. While this is a small pilot limited to garden waste, it will be interesting to see if it replicates Defra's findings – that incentives tend to reward those who are already recycling – or if it does drive up composting rates, as RecycleBank's American experience would suggest.

Incentives have the potential to be a key part of waste and recycling, if cleverly deployed. The right incentive for the targeted households and communities could be a very effective driver of recycling and separation, although the devil will be in the detail.

Paying for waste

Waste services will, for the foreseeable future, have to be paid for even if the value of the materials is fully realised. While the shift to resource management will change the nature of the waste system, the infrastructure alone will require billions of pounds of investment that will eventually be recovered from consumers' bills. Transparency in billing is vital to avoid any charges being seen as a stealth tax.

Itemising the cost of waste services on council tax bills will have several benefits. Demonstrating how small a proportion of the bill goes on waste will make any future changes to the service easier to accept. As always, transparency in where public money is spent is essential to public confidence.

67 "A Framework for Pro-environmental Behaviours", Defra, January 2008

68 "Evaluation of the Household Waste Incentives Pilot Scheme", Defra, July 2006

69 "I will if you will", Sustainable Consumption Roundtable, 2006

70 "Background to RecycleBank", RecycleBank

6

What should be collected and how?

Recommendations

Councils should be prevented from forcing an excessive number of bins on households. Councils which require their residents to keep five bins risk overloading householders and generating resentment. Three bins, for food waste, dry recyclates and residual waste, should be the limit on what householders can be expected to put up with, and government should regulate to that effect. This implies that recyclates should be separated either at a materials recovery facility (MRF) or by kerbside segregation.

Household collections should be standardised over time to around five or six basic collection systems. The variety of detail and combinations of materials collected is a cause of frustration and confusion. Encouraging local government and the waste industry to standardise would reduce these problems and allow for enhanced national level education.

The national deposit scheme proposed in Policy Exchange's report *Litterbugs: How to deal with the problem of littering* should be introduced, resulting in improved removal of materials such as glass, cans and plastics from the waste stream. Diverting containers, especially those made of glass, from recycling would improve the quality of recycling collections and simplify separation.

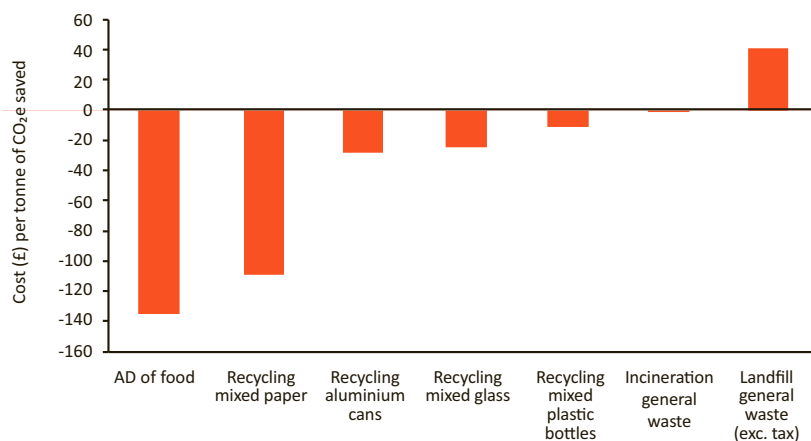
Food waste should be collected separately. Removing food waste from the residual waste stream could significantly reduce greenhouse gas (GHG) emissions enabling it to be used in anaerobic digestion (AD). It also decreases the need for collecting the remainder of each household's waste and drives up recycling if combined with alternate weekly collections. In areas of high population density and especially high-rise flats, separation is unlikely to be possible and should not be enforced.

Balancing economic and environmental imperatives is useless if it results in householders being overstretched and refusing to comply with the needs of an over-complicated system. Collection services do not have to be complicated to present opportunities for valuable processes, but they do need to be designed with economic and environmental needs in mind. The goal should be easy-to-use services that produce efficient and environmentally acceptable outcomes, not massive complexity that deters people from doing the right thing.

Comparing the costs of emission reductions

Recycling is an industry with a long history for some materials. Metals and paper were economically viable to recycle even before recycling became an environmental imperative. The benefit of recycling some materials rather than sending them to landfill is significant, as shown in figure 6. The cost per tonne of CO₂e saved is negative for recycling aluminium, glass, mixed plastics and paper, meaning that recycling it makes a profit. Landfill presents a large net cost, but incineration shows a small net saving if it is highly efficient and used for CHP rather than just electricity generation.

Figure 6: Cost (£) per tonne of CO₂e saved for different waste materials and processes⁷¹



These results support the findings made throughout the report that landfill is clearly the worst option and should be reduced as far as possible. It also supports the view taken here that incineration is acceptable with highly-efficient plants and CHP and recycling is profitable for many materials with the right collection system.

It should be noted that Figure 6 should be taken as illustrative only. Assessing cost per tonne of CO₂e saved for different waste materials and processes is methodologically difficult. The efficiency of incineration or recycling and how materials are collected and processed, amongst other things, make direct comparisons imperfect.

What to collect

Separation is a key concept in extracting value from waste. The quality of materials for recycling is very important for the price they achieve. Under the Household Waste Recycling Act 2003, local authorities are required to collect “at least two types of recyclable waste together or individually separated from the rest of the household waste”.⁷²

What those should be is an important question. Most authorities collect paper, card, plastics, glass and cans, as well as garden waste and in some cases food waste. As discussed earlier, in many cases materials are collected for their weight

71 Virtanen, Y, Nilsson, S (1993) “The environmental impacts of waste paper recycling.” IIASA, Luxembourg; USEPA (2002) Solid Waste Management and Greenhouse Gases. “A Life-Cycle Assessment of Emissions and sinks” 2nd edition EPA530-R-02-006, May 2002; Plastretur AS and Stabburet AS (not dated) “Life Cycle Assessment of Different Scenarios for Waste Treatment of a Plastic Bottle Used for Food Packaging”; Smith A, Brown K, Ogilvie S, Rushton K and Bates J, 2001, Waste Management Options and Climate Change; Laurence Dolan, Life Cycle Assessment. WRAP 2008 “Comparing the cost of alternative waste treatment options” and www.letsrecycle.com. Recycling prices are the latest minimum price.

72 Household Waste Recycling Act 2003, 1 (3)

and therefore contribution towards tonnage targets. Some materials would be better dealt with outside the normal waste stream, for example glass.

There is an ongoing debate about how much to separate and who should do it. Source-separated collections, where households separate their waste before collection, kerbside sorting by collection staff, and co-mingled, where all the recyclables are mixed, each have benefits and drawbacks. Collecting food waste separately has been tested but not implemented widely, while the debate over AWC or weekly collections flares up in different authorities over time. Different areas will have different systems, but where things can be separated without overburdening householders they should be. AWC tends to lead to higher recycling yields and, with separate food collection, can work very well; however, in some areas it is not practical.

The other key question is what to separate. There are two waste streams which can be particularly problematic in processing, glass and food. Food waste, when combined with dry recyclates such as paper, is unrecyclable, while glass can damage paper mills and other expensive equipment.

“Low to medium density housing in areas with little deprivation produced high yields and participation rates of over 70% of households”

Food

There would be a considerable potential added benefit to collecting food separately. As it is biodegradable, food waste releases large amounts of GHG when it rots in landfill. Collecting it separately from other waste produces a feedstock for AD, a proven technology utilised on a relatively small scale so far in the UK. If food is stripped out from residual waste it can be used productively, give off fewer emissions than in landfill and help to diversify the UK's energy supplies.

WRAP has done extensive trials of separate food collections. Low to medium density housing in areas with little deprivation produced high yields and participation rates of over 70% of households. There was some reduction in home composting as a result. This mirrors recycling closely, suggesting that a switch to food collections would be easily managed in areas like this.⁷³

There remains the question of whether to mix kitchen and garden waste. Participation was greater and the capture of food higher in food-only collections in trials run for Defra. This is particularly the case with meat, which can be anaerobically digested but not composted.⁷⁴ The major disadvantage of mixing food and garden waste is the missed opportunity to generate the most value. This sort of waste has to be composted in-vessel to comply with the Animal By-Products Regulations which seek to prevent diseases such as BSE. This is more expensive than ordinary composting and its output far less valuable than AD. It makes very little sense economically or environmentally to mix the two – unless the priority is meeting tonnage targets.

As in all recycling, higher density areas present difficulties for food collection. Flats are particularly hard to collect from; the yields in WRAP's trials in high density areas are about a third to a quarter of those in lower density areas.⁷⁵ This is a major limitation on how much can be achieved with waste, since almost nothing can be done about it. The other key finding was that areas with fortnightly collection produced higher yields. In terms of designing the collection, using liners made from corn starch for food bins significantly improved the service, with almost no problems at all and increased satisfaction among households.⁷⁶

73 “Food Waste Collection Trials – weekly collections of food waste in low & medium density housing areas”, WRAP

74 “DEFRA: Enhancing participation in kitchen waste collections”, Brook Lyndhurst, 2008

75 “Evaluation of the WRAP Separate Food Waste Collection Trials”, WRAP

76 “Food Waste Collection Trials – use of liners for kerbside containers and kitchen caddies”, WRAP

Glass

Glass exemplifies the trade-off in separation – mixed glass being easier for households but sorted glass much more valuable. Because there is much more demand for clear glass in the UK, but greater supply of green glass, mixed collections are potentially missing out on the value in the waste stream.⁷⁷

Technology to separate mixed colour glass is developing, which could solve the problem of mixed collections in the long term. However, there is another problem with glass: contamination of paper. It can also present a hazard to manual collectors once smashed. The chief executive of SITA UK has argued that "Separating glass from other recyclables, via bring-banks or kerbside collections, leads to a vast improvement in the quality of the material for reprocessing. And quality is improved further when the glass is separated into individual colours."⁷⁸

Beyond reducing glass consumption, re-use and melting into new glass packaging are the most carbon-efficient ways to make the most of glass.⁷⁹ It should be a priority to split glass out of the waste stream to drive up quality of collection of all materials.

How to collect it

Keeping waste services appropriate to households' needs and capacities is important. Public support for recycling and the need for co-operation with collection services are both paramount to achieving environmental and economic goals. This is where the trade-off between quantity of recovered material and the quality of separation and outputs is at its most acute. This trade-off needs to be solved across a range of neighbourhoods, housing and people, needing well designed and well explained services.

With glass and food stripped out, co-mingled collection becomes much more attractive, with fewer contamination problems and the benefits of ease of use for householders. Co-mingled

collections can either be sorted at an MRF or by collecting staff at the kerbside. In either case, stripping food and glass from the waste stream makes this a simpler task. It would also make separation by householders simpler. WRAP found that there is little variation in yields from the main types of kerbside collection in terms of cost, making co-mingled collections without food or glass no more expensive than collections which include them.⁸⁰

With food separated out, the urgency to collect residual waste frequently diminishes. A weekly collection of food waste would reduce the residual or left-over waste by about a third but also deal with the "yuck factor" of fortnightly bin collections.

The combination of food collections and AWC presents an opportunity to improve services significantly with added separation. In research by MORI, opposition to AWC dropped significantly when respondents were asked if they would support a change in their collection if a weekly food collection were introduced. While there was still some opposition, 48% did support the idea.⁸¹

“ In research by MORI, opposition to AWC dropped significantly when respondents were asked if they would support a change in their collection if a weekly food collection were introduced ”

77 <http://www.letsrecycle.com/materials/glass/>

78 "Waste giants endorse use of bring banks", LetsRecycle.com, 19th February 2009. The term "bring bank" is itself controversial, implying a journey specifically for dropping off waste. The term "drop-off points" is much more attractive because it discourages such journeys

79 Institution of Civil Engineers and Institution of Mechanical Engineers, 2006, op cit, p11

80 "Kerbside Recycling: Indicative Costs and Performance", WRAP, 2008, p3

81 "Weekly or Fortnightly?", Ipsos MORI

The other main finding from this poll was the significance of household size. Families with young children or mixed households with five or more members found it harder to cope with AWC than smaller households. There were particular problems with the size of the bin or recycling container, but these households also had the greatest problems with smells and flies.

Perhaps the most important lesson for policymakers from MORI's polling is public opinion on the motives for changing to AWC. A large majority of those who still have weekly bin collection believe a shift would be primarily for the council's financial benefit (68%). Although more who have AWC believe in the environmental motive (44%), a similar proportion (43%) sees money as the main cause of their council's policy. This reinforces the importance of communicating well with households about why their service is changing and what the environmental benefits are.

Opposition to waste services tends to focus on the complexity of collection and the number of bins. That some councils require residents to use five different bins for different materials is ludicrous. With the changes in the waste streams outlined above no more than three bins should be used. Government should protect householders from over-zealous councils by banning local authorities from forcing more than three bins on any household.

“A large majority of those who still have weekly bin collection believe a shift would be primarily for the council's financial benefit (68%)”

Variety or standardisation?

Public services are often assumed to be universal and uniform. A “postcode lottery” in waste is not a terribly attractive prospect to policymakers, but different neighbourhoods are likely to have different optimum services. WRAP's guidance states that “AWC is not suitable for all authorities,” a sentiment which could be applied to any waste system.⁸² Suburban or rural areas are much more likely to cope with AWC than high-density neighbourhoods. Similarly, the extent to which people can separate their waste for recycling is going to vary because of spatial constraints in dwellings and for collection.

Defra-funded research identified groups of people with differing attitudes to waste and recycling. “Positive Greens” made up 18% of respondents, while the “Honestly Disengaged” made up exactly the same proportion.⁸³ Recognising that people vary in their ability and willingness to participate demands sensitive design of services to get the most out of each household. Failure to take account of the differences in capability and opportunity to recycle risks setting the bar too low for the most engaged, while alienating those who are currently not recycling much.

It is inevitable that waste services will vary across local authorities. It is not, however, inevitable that within the same authority a single service will work. Authorities with an urban and rural mix will be unlikely to find that the same service will suit both parts of the area. High-density housing presents a different challenge to suburban areas, and there are many authorities with a mix of both.

A common theme of discussion with senior executives in the waste industry is standardisation. Because local authorities specify the service offered, there is a

⁸² “Alternate Weekly collections Guidance”, WRAP, p7

⁸³ “A Framework for Pro-Environmental Behaviours”, Defra, 2008, p8

bewildering array of slightly different schemes. As well as assisting industry to achieve economies of scale across different authorities, standardisation could offer benefits wherever there is a marked turnover of population.

One senior executive raised the lack of standardisation as a disadvantage because it precluded national level education on recycling. A lack of clarity over what goes into recycling, for example whether things should be rinsed, is potentially a problem if it has an impact on quality of separation or on public enthusiasm.

quality of separation or on public enthusiasm.

An executive from another waste company pointed out the benefits of standardisation for investing in infrastructure. Large projects, such as EfW

“Positive Greens” made up 18% of respondents, while the “Honestly Disengaged” made up exactly the same proportion”

plants, typically take waste from several authorities. Standardising collection systems would be particularly important for more sensitive technologies such as AD, which cannot take the garden waste that is often included in organic waste collections.

Introducing standardisation would significantly increase the role of government. It would change Defra’s relationship from one of setting general direction to restricting combinations of materials that can be collected. This would overstep the boundary of appropriate government intervention. Standardisation by the industry would be preferable, although with a fragmented market it would be difficult. Government should take a lead in bringing together local government and the waste industry to encourage standardisation over time.

Establishing a proper market in materials offers a market mechanism for standardisation. If there were greater market incentives it is likely that there would be consolidation in the industry and also that firms could gradually standardise across different areas and customers. It would not be inappropriate for government agencies to push for standardisation to some extent to enable national level information campaigns and labelling. Whether bottle tops can be included in recycling, or whether to rinse out food containers thoroughly are examples of small details which can be frustrating to householders and which could be standardised easily. Standardising collection will be less easy, but even here a small number of basic patterns could be encouraged to emerge from the new waste authorities.

7

Implementation

The recommendations made in this report, if implemented will result in a better service for householders, with much improved environmental outcomes at lower cost and with potential for economic development. By getting the frameworks and incentives right, the value of Britain’s bins can be unleashed, householders can receive the service they need and industry can make money while protecting the environment. All of this will reduce the cost to government.

Implementing an ambitious reform programme is more challenging than recognising the need for one. This chapter outlines how to arrive at the right balance between local government autonomy and national strategic direction while obtaining all the benefits for householders, energy security and the environment. Doing so in a reasonable timeframe is important if we are to seize the benefits of the reforms.

The politics and timing of implementation

A “big bang” in waste would see both the institutional structures and incentives radically simplified. Abolishing the distinction between waste collection and disposal authorities and forming joint waste authorities presents a major opportunity to design better services, make efficiency savings and improve environmental performance. Using the idea of resource management, economic value can be maximised while GHG emissions are minimised.

These reforms necessarily involve trade-offs, between the three principles running through the report and between key actors. Strategic, centralised decisions are necessary to set the framework, encourage standardisation and deliver the major infrastructure that is needed. However, local authorities need freedom to innovate and design the right services for their residents and businesses. Removing certain targets imposed from the centre as proposed will allow district councils to innovate more than they do at present under tonnage targets. This effectively puts environmental priorities at the heart of decisions rather than targets, even if they are intended to drive environmental improvement.

The reform of waste governance will tie collection much more closely to disposal, resulting in improved performance and efficiency savings as well as standardisation across neighbouring districts. At a national level, the Government will be more likely to hit its GHG emissions targets under these reforms, while changing the terms of the debate on bin collection. Householders will have the reassurance that they will not be overwhelmed by bins while seeing reduced bills.

The knowledge of how much they are paying for waste should also help to gain acceptance for direct charging with incentives that will improve the recycling rate.

The timing of reforms is important. Local authorities need to have enough time to reorganise themselves into new waste authorities, work out the contractual details of such a reorganisation within the new authority and prepare for the new framework of incentives. These all require time. Contracts for collection typically last three to seven years, meaning that the roll out of new authorities should be completed at the latest by 2017.

The important external constraints are the 2013 and 2020 European directive targets on diverting biodegradable waste from landfill. Given that waste infrastructure takes time to develop and that the landfill tax is set up to 2013, this reform should be aimed at hitting the 2020 target, a 65% reduction in biodegradable waste going to landfill compared to 1995. With separate food collections and the roll out of AD, this is easily achievable, with all the energy, climate and economic benefits added in. Without these changes this target is in danger of being missed, as is the opportunity to deliver better treatment of food waste.

Structural reforms

Changing the governance of waste presents opportunities for simplification, efficiency savings and better design of services. The Local Government Association (LGA) estimates that savings in the region of £150 million can be found through local government co-operation on waste services.⁸⁴ By bringing together the governance of waste, this could be exceeded, as administration and bureaucracy can be slimmed down even further than the LGA's estimate suggests.

As collection contracts run for between three and seven years "shadow" waste authorities should be established out of the existing authorities until the existing ones cease to exist as their contracts expire, in a similar process to local government reorganisation.⁸⁵ This will ease in co-operation between councils before their waste services are formally merged, as key officers and councillors get used to the new arrangements. In many cases the shadow authority will be made up of the present waste disposal authority plus representatives from the collection authorities it serves. In these cases, the disposal authority will effectively take on collection responsibilities as contracts for collection authorities expire.

To give suitable notice and to allow contracts to run out, the phasing-in period of these reforms should be roughly 2013-17. This allows time for collection contracts to run out and be renegotiated with the new authorities and for waste disposal authorities to work on infrastructure needed after 2013 with as little uncertainty as possible.

Bringing C&I waste within the scope of municipal waste offers another route to significant economies of scale. Where this waste is similar to that from households, there is no reason to separate it on the basis of where it has come from. The legal reform could be enacted extremely quickly, the only requirement being a change in the definition of such waste. It may take some time to be delivered on the ground depending on existing contractual obligations between businesses and their current waste services.

⁸⁴ "Working together on waste", Local Government Association, 2008, p3

⁸⁵ Statutory Instrument 1994 No. 867, The Local Government Changes for England Regulations, 1994

Financial incentives

The reform of the landfill tax into a broader, more nuanced waste taxation regime is intended to change behaviour rather than raise revenue. The introduction of a small tax on incineration would initially raise some revenue for the Government and increase costs for disposal. However, by giving certainty over rates for the medium to long term it will reduce uncertainty for investment in the infrastructure needed to better manage waste. This will decrease the amount sent for landfill, avoiding the highest rate of tax paid by disposal authorities to government and thus reducing bills for householders.

The current policy framework is not delivering enough to be confident of meeting the landfill diversion targets in the waste directive. Meeting the target depends on infrastructure being delivered and this is not happening quickly enough.

The National Audit Office (NAO) estimates that with lower than expected delivery of infrastructure projects, fines payable for missing the targets by 2013 could reach £366 million.⁸⁶ While the NAO report does not make similar estimates for the 2020 targets, without much better recycling, waste reduction and infrastructure delivery there must be concern that these targets are also at risk of being missed.

Itemising waste charges on council tax bills would have little financial effect but would give much better information to council taxpayers about what their money is spent on. Demonstrating how little as a proportion of typical households' council tax is spent on waste, typically £100 per household per year, should give more freedom to reform the service, as well as making the introduction of direct charging with incentives for householders easier. Public knowledge of the cost of waste services should draw the sting of many of the debates about it, as well as exert pressure for value for money in waste services.

Our proposals give clear incentives to reduce environmental harm, especially landfill. Depending on how much waste is diverted to EfW, recycling or AD, household waste bills could fall by around 20% by 2012-13.⁸⁷ If the new waste authorities use powers to offer incentives as proposed in this report, the effect on household bills could be even more dramatic. While the specific details of those incentives should be left open to the new authorities to develop, incentives can have a significant effect on householders, especially those not currently recycling. Combined with a drop in national landfill rates due to the reforms suggested in this report, waste bills would fall by nearly half for the best performing households.

“ fines payable for missing the targets by 2013 could reach £366 million ”

Collection

Simplification of collection services for households will improve the relationship of householders with their waste services. Councils have tended to overburden households with bins for separation, which can be better achieved by kerbside sorting or the use of MRFs. Simplifying and standardising collection as contracts are renewed would have negligible costs.

District councils in one county merged their waste services in a similar way to the recommendation made in this report and made an annual saving of £2 million on collection alone, around £8.60 per household per year.⁸⁸ When

⁸⁶ National Audit Office, *op cit*, p7

⁸⁷ Assuming some waste reduction, diversion from landfill to EfW and recycling and economies of scale from collection

⁸⁸ Cited by one expert

combined with increased value recovered from the waste stream, economies of scale from merging C&I with household waste the potential savings are much higher. The savings made from improved services should approach or even exceed the cost of replacing and upgrading the UK's waste infrastructure, estimated at

“ District councils in one county merged their waste services in a similar way to the recommendation made in this report and made an annual saving of £2 million on collection alone, around £8.60 per household per year ”

£18.60 per household per year for 20 years.⁸⁹ Given the right incentives and regulation, new, better infrastructure can more than pay for itself.

More efficient collection services should be an outcome of redefining commercial and industrial waste that is similar to household waste, because collection vehicles can be used for more rounds throughout the day. This change

would also generate economies of scale for infrastructure, generating further savings. This is common practice throughout almost all of the rest of Europe.

The national deposit scheme proposed in *Litterbugs: How to deal with the problem of littering* has a potentially significant impact. Waste services would benefit from the removal of glass, and the deposit scheme would benefit from the transfer of glass and cans. A similar scheme in New York State recycled 90 billion containers over 25 years, saving an estimated 200,000 tonnes of GHG emissions per year.⁹⁰ While the deposit scheme would be unlikely to replace all glass collection, it would present a substantial reduction in the amount of glass collected as waste while improving the quality of separation of that which is collected and reducing costs of separation by hand or at MRFs.

Separate food collection should have no added costs, given that it allows less frequent collection of residual waste. As long as the food waste is put to good use in AD, it will represent a net saving in GHG emissions. The valuable energy outputs of AD and carbon emissions avoided by not landfilling biodegradable waste represent financial savings as well.

Energy and GHG emissions

The benefits of energy security and decarbonisation are potentially worth hundreds of millions of pounds. By combining a pragmatic, even-handed approach to EfW with enthusiasm for AD, waste can make a significant contribution to the UK's energy needs. Taking National Grid's upper estimate, 18% of total UK gas demand could be met by producing biomethane. As this replaces natural gas it can secure GHG emissions savings of nearly 12 million tonnes of CO₂e per year, worth nearly £9 billion up to 2050, calculated using the government's shadow price of carbon.⁹¹

There would be significant savings in GHG emissions from diverting waste from landfill. Taking 2007 data and prices, the UK emitted 21.2 million tonnes of CO₂e from waste.⁹² At the shadow price of carbon for that year, the cost of these emissions is more than £530 million.⁹³ This could cumulatively cost up to £20 billion by 2050, when UK GHG emissions are legally mandated to be reduced by 80%. Given the large potential carbon savings from improved waste management, the financial savings are immense. WRAP estimates that at least 15 million tonnes of CO₂e could be saved by better management of food waste alone.⁹⁴ If this were achieved, it would be worth nearly £400 million per year, reducing the potential cost by £13 billion up to 2050.

89 £30 billion cost split between C&I and domestic waste by proportion of waste stream, spread over 20 years.

90 Lewis A, Turton P and Sweetman T, *Litterbugs: how to deal with the problem of littering*, Policy Exchange, 2009

91 "Environmental Accounts: Emissions, Greenhouse Gases, 93 sectors", UK National Statistics; <http://www.statistics.gov.uk/statbase/ssdataset.asp?vlnk=5695>. "How to use the Shadow Price of Carbon in policy appraisal", Defra. 18% of 6263000 tonnes of CO₂ equivalent per year from gas distribution and 58,951000 tonnes from electricity generation at £25.50 per tonne shadow price of carbon from 2030 to 2050, plus half of that for the period between now and 2030 to allow for developing capacity

92 "Environmental Accounts: Emissions, Greenhouse Gases, 93 sectors", UK National Statistics, <http://www.statistics.gov.uk/statbase/ssdataset.asp?vlnk=5695>

93 21,169 thousand tonnes at £25.50 per tonne. "How to use the Shadow Price of Carbon in policy appraisal", Defra

94 "Household Food Waste", WRAP; http://www.wrap.org.uk/retail/food_waste/index.html

Conclusions and recommendations

Waste policy has a variety of shortcomings at present which, when taken together, produce an outcome far below what could be achieved. Structural shortcomings, such as the split in local government arrangements in some areas, combine with confused incentive structures to produce sub-optimal outcomes, such as the prioritisation of weight over environmental or economic impacts of waste.

The three principles outlined at the start of this report shape its recommendations. Where the present system is failing on the environmental, economic or ease-of-use fronts, our recommendations will bring significant improvements. Where different initiatives, incentives or policies are actively conflicting they need to be clarified and prioritised.

Environmental standards are of critical importance. Shaping the available choices and understanding the social costs of different treatments and services is crucial to achieving the right system. Designing waste services according to central government targets that are easy to measure but environmentally irrelevant is entirely pointless.

Within the limits of environmental acceptability, economic efficiency and development are important. The reward for designing an excellent service is profit, not virtue. Paying for waste infrastructure and using economic incentives to reflect the environmental costs of treatments leaves lots of scope for innovation and seeking value. Getting the most out of Britain's bins is an economic as well as material goal because there are significant resources literally going to waste. In terms of economic development, doing more can be done with waste for a profit. Whether by reducing energy bills, providing business opportunities or saving money from local taxation, waste has value waiting to be extracted.

Providing a suitable service to households is essential for achieving environmental and economic goals. Householders are easily forgotten when designing ideal waste systems but they must be borne in mind as an integral part of that system. The politics of waste largely centres on household collections and the controversies of fortnightly collections. With high levels of landfill avoidance and creative use of incentives, households that recycle lots could see their bills for waste services fall by nearly half.

Several groups of recommendations have emerged from this report. The governance and incentive structures in waste are a mess and need to be radically overhauled. Getting the right authority operating within a consistent and clear incentive structure should unleash much potential that is currently missed. The right incentive structure will be more effective than government targets and the threat of fines. It also allows much more diversity of means by being tightly focused on ends.

Beyond structural reforms, there are specific policies that could have a huge impact. The national deposit scheme recommended in *Litterbugs: How to deal with the*

problem of littering can be used to remove a large proportion of problematic materials such as glass from the waste stream as well as tackling litter. Food collections present an opportunity to contribute to renewable energy and drastically cut carbon emissions.

The reforms set out below can extract much more value from Britain's bins at less cost to the environment, cause less hassle to householders and provide economic benefits including greater energy security.

Structural Reforms

Abolish the present waste collection and disposal authorities and create single-tier waste authorities in England. By simplifying local governance of waste in many areas, the clear incentive structure discussed previously can efficiently bind in the key actors in waste services: households, local government and the waste industry.

Abolish recycling tonnage targets for local government. Tonnage targets lead to collecting materials of marginal environmental and economic benefit. Abolishing National Indicators 191, 192 and 193 will, in combination with the new single tier authorities, focus waste services on achieving their environmental, economic and social goals.

Commercial and industrial (C&I) waste from small businesses should be integrated with municipal waste. Throughout most of Europe, commercial and industrial waste similar to household waste is included in the definition of municipal waste. Reforming the legal definition in the UK would increase the economies of scale for local government and the private sector to invest in waste infrastructure. Simplifying waste services for small businesses would be a benefit whereas large businesses should continue to have responsibility to manage their own waste as they do now. This change should be introduced over time with an opt-out for an introductory period to smooth transition from contracts already signed.

Finance and Incentives

The landfill tax should be reformed into a broader waste tax covering all disposal processes in line with the waste hierarchy. The rates of this tax would reflect the relative damage done to the environment by different processes and incentivise reuse, recycling and energy recovery, including the separation of food waste where possible. By introducing taxation on incineration a clear preference is signalled to reduce, reuse, recycle or compost where possible. To limit uncertainty, escalating rates should be set over a long enough period to encourage investment.

Itemise waste charges on council tax bills as a precursor to direct charging. Waste is politically controversial largely because of the council tax. Demonstrating the relatively small amount each household pays towards waste services in a similar way to police or fire services would enable a shift over time to direct and variable charging. This enables the use of incentives to encourage reluctant households to participate, embedding the householder in the incentive structure found in the

rest of the system. Bringing much-needed transparency to how waste services are funded would enable taxpayers to hold their local authorities to account more effectively. Local councils should be free to offer incentives, discounts and other innovations in how waste is charged for, driving down costs and improving value for money.

Collections

Councils should be prevented from forcing an excessive number of bins on households. Councils which require their residents to keep five bins risk overloading householders and generating resentment. Three bins, for food waste, dry recyclates and residual waste, should be the limit on what householders can be expected to put up with, and government should regulate to that effect. This implies that recyclates should be separated either at a materials recovery facility (MRF) or by kerbside segregation.

Household collections should be standardised over time to around five or six basic collection systems. The variety of detail and combinations of materials collected is a cause of frustration and confusion. Encouraging local government and the waste industry to standardise would reduce these problems and allow for enhanced national level education.

The national deposit scheme proposed in Policy Exchange's report *Litterbugs: How to deal with the problem of littering* should be introduced, resulting in improved removal of materials such as glass, cans and plastics from the waste stream. Diverting containers, especially those made of glass, from recycling would improve the quality of recycling collections and simplify separation.

Food waste should be collected separately. Removing food waste from the residual waste stream significantly reduces greenhouse gas (GHG) emissions by diverting food waste to anaerobic digestion (AD). It also decreases the need for collecting the remainder of each household's waste and drives up recycling if combined with alternate weekly collections. In areas of high population density and especially high-rise flats, separation is unlikely to be possible and should not be enforced.

Energy

Using waste to generate energy should become a central pillar of government policy in this area. This is currently underutilised in UK waste management. Energy can be extracted from waste through the anaerobic digestion of organic waste (principally food) to generate biogas and through the use of energy from waste (EfW). Both of these are a much better alternative to landfill for residual waste. EfW plants should include combined heat and power (CHP) where possible, so that sustainable, cheap and low carbon electricity and heating can be provided simultaneously for local communities. Together, these changes will help us to reduce our GHG emissions significantly and deliver increased energy security.

A Wasted Opportunity? How to get the most out of Britain's bins explores the shortcomings and missed opportunities in Britain's waste system. It tackles how waste is governed, paid for, collected and processed. The report explores how to get the most value at least environmental cost while delivering an improved service for householders. Its bold recommendations offer a radical reform of how waste is dealt with. In writing this report the authors have drawn on expertise and knowledge from a wide range of businesses, officials, NGOs and independent experts.



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