January 2010

The Mayor's Draft Municipal Waste Management Strategy

London's Wasted Resource

MAYOR OF LONDON

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Greater London Authority
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Foreword

by Mayor of London, Boris Johnson

London produces a massive 4 million tonnes of municipal waste every year, most of which comes from households and small businesses. Too much of this currently ends up being buried for millennia in costly landfill sites or incinerated. Not only does this levy a heavy tax on our environment, it is also a massive missed economic opportunity for the capital.

It does not have to be this way. This Everest of waste material provides a goldmine for us to plunder, a valuable resource which currently we are simply chucking away. First of all we need to prevent as much of this waste being generated as possible and then harvest the material that is left to stimulate an income for the capital from the development of world leading technologies to produce recycled materials, generate cleaner energy and to create green collar jobs. My ambition is to dig deep into this rich seam of potential, attracting investment and dramatically reducing the impact of rubbish disposal on our carbon output. By 2025 I want London to be sending zero of its municipal rubbish to landfill.

Reaching these ambitious but essential goals requires a radical re-focus. London's waste management is complex, involving many organisations. The current system can be unnecessarily confusing for Londoners. These proposals show how we can develop a coordinated approach to waste management in London that will be both clearer for Londoners and more effective.

Reducing and reusing a significant portion of the material we currently throw away is an absolute imperative. We must drive down the volumes of waste produced in the first instance and support both practical and creative ways to reuse products as much as possible. This requires a paradigm shift away from a throwaway culture but this will liberate a significant portion of taxpayers' money currently committed to dealing with rubbish and reap considerable benefits for the environment and offering opportunities for job creation.

Recycling levels in the capital are steadily improving with some boroughs achieving commendable results, but we need to do more. I want recycling to rapidly become much more a part of everyday life whether at home, on the move or in the office. Not only should we routinely recycle paper and cans, but also food waste and plastics. Not all Londoners have a level playing field when it comes to recycling facilities. I want everyone in London to be able have easy access to recycling whether they live in the suburbs or inner London, in high rise flats or multi occupancy buildings.

We have to redouble efforts to make the recycling of waste easier than throwing it away. By 2020, London should be recycling half of the waste coming from households rising to 60 per cent by 2031. I believe this can be done in part by the introduction of strong incentives - carrots rather than sticks - to encourage residents to do the right thing.

The residual waste which cannot be prevented in the first place, or put to good use, will be harvested to create greener energy and fuel. We estimate the economic value of this to be more than £80 million. By embracing clever, cleaner

technologies, we can also develop a greater capacity to deal with London's waste within our boundaries.

These targets are challenging. They require robust action from everyone in London - those that generate waste and those with a shared responsibility to dispose of it notably the Mayor, residents, boroughs, waste authorities, industry and government. But the rewards are high.

I want London to become the best big city on earth. We can only achieve this if we wisely manage the rubbish our lifestyles create and become a world leader in waste management. I look forward to hearing views on the proposals contained here.

Boris Johnson
Mayor of London

Introduction

The world of waste is changing. The past 20 years has seen the public, private and third sector invest considerable amounts of time, money and effort into changing the way we think about and manage our waste.

In 1989, London's boroughs recycled just 2.1 per cent of the waste they collected. In 1999 they recycled only eight per cent. London's boroughs now recycle 25 per cent. This is an impressive improvement – but still more can and should be done. Whilst we have been moving away from a culture of waste disposal and indiscriminate incineration to one of recycling, we must now move to a culture of waste minimisation and reuse, high rates of recycling and low-carbon energy generation. With climate change a key consideration in what we do, the potential associated benefits in terms of carbon savings, reduced energy costs, energy security, and jobs creation are becoming ever more apparent.

London produces around four million tonnes of municipal waste a year. Municipal waste is waste collected by boroughs from households, litter from streets and parks, and some of the waste from small businesses. The cost to London of managing this waste, including the collection, transport, treatment, and final disposal activities, is approximately £600m every year. Although London's recycling performance has improved dramatically in the last 10 years we still have a long way to go. London's municipal recycling rate is the lowest of all English regions, reflecting the challenges a dense urban environment presents. London's recycling rate also compares poorly to other international cities like Berlin (41 per cent), New York (34 per cent) and Sydney (29 per cent), although it is better than Paris (19 per cent). Recycling performance is not consistent across all London boroughs, ranging considerably from the low teens to the low fifties. However all London boroughs face challenges in providing good quality, convenient, cost effective recycling collection services for flats and multi-occupancy buildings – which account for 50 per cent of London's housing stock. Improving recycling rates from flats - currently around 10 per cent - will therefore be essential to improving London's recycling rates.

Reducing the amount of waste produced and reusing waste that cannot be prevented presents the greatest economic and environmental benefits for London. To continue to manage waste by investing in expensive waste collection and treatment without an active strategy of reduction and reuse is illogical. The Mayor will set out in this document what actions London's households and businesses can take to reduce waste – but will also call on the government and industry to play a role.

The waste industry is also ready for change. Increasingly there is a greater acceptance that we need to move away from traditional mass-burn incineration of waste and towards the use of cleaner, more efficient energy-recovery techniques, whereby any valuable materials are recovered from the waste stream and as much of the energy produced is recovered. New opportunities exist for using advanced conversion technologies, such as anaerobic digestion, gasification and pyrolysis. These are now available commercially and the

government is offering incentives for their use through mechanisms such as Renewable Obligation Certificates. A number of the major waste management companies have anaerobic digesters operating in the UK. More anaerobic digesters have received planning approval or are under construction, including two facilities in Manchester with capacity for treating 130,000 tonnes of waste a year. One gasification facility with capacity for 400,000 tonnes of waste year has been granted planning permission in Eastham, Merseyside. One major waste management company has recently announced plans to develop six gasifiers in the UK, and London has approved planning for its first gasification facility.

Developing a strategy for London's municipal waste

There are a number of key considerations influencing the Mayor's municipal waste management strategy. The overriding one is the need to manage London's municipal waste effectively and efficiently. The rising cost of landfill, growing concerns around energy and climate change, emergence of new commercially available waste technologies, and changing consumer behaviour have all made a "business as usual" approach no longer viable. Climate change is a key driver for London's municipal waste management policy. Sending waste to landfill generates greenhouse gas emissions – particularly biodegradable waste, such as food, green garden waste, and paper and card, which release methane (a powerful greenhouse gas) as it decomposes. In total, the municipal waste that London sends to landfill generates approximately 520,000 tonnes of greenhouse gas emissions each year, expressed as a carbon dioxide equivalent (CO_2eq) figure[1].

There is a massive opportunity for London to achieve significant greenhouse gas savings by diverting more municipal waste away from landfill. Most of the waste we throw away could be reused, recycled or composted, or used to generate renewable energy, which would achieve significant CO_2eq savings. By first reducing the amount of municipal waste produced and then selecting the optimal means for dealing with the municipal waste sent to landfill, London could save approximately two million tonnes of CO_2eq emissions each year. This significant saving is a combination of avoiding the emissions that would have occurred from sending waste to landfill plus further savings of approximately 1.5 million tonnes achieved by avoiding emissions involved in manufacturing from virgin materials, and in generating energy from coal or gas. This would produce a substantial positive carbon outcome from London's municipal waste.

In addition to the carbon savings made, optimising the treatment of waste can also contribute significantly to a reduction in London's energy bill. Based on the wholesale cost of electricity and gas, London's municipal waste after maximising recycling could contribute £80 million of savings to London's £4 billion electricity bill and £24 million off London's £2.6 billion gas bill.

The second biggest driver is the increase in costs due to landfill tax. The main effect the landfill tax has had over the past six years is to make the cost of recycling (including collection costs) cheaper

than landfill – approximately £86 per tonne for recycling compared to £126 per tonne for landfill. Today landfill tax stands at £40 per tonne. This will increase by £8 each year until at least 2013, when it will be £72 per tonne. This will increase London's current annual municipal waste to landfill bill from about £245 million to roughly £307 million. Landfill tax has also made the cost of energy recovery from waste more comparable to landfill, and in some cases more commercially attractive, depending on contractual arrangements.

It is estimated that in preparing London to manage its municipal waste in the most carbon efficient and economically beneficial way that the number of green-collar jobs, ranging from research and development, project management and manufacturing through to maintenance and operation of the facilities needed could be in the region of 350 each year to 2025.

The Mayor's vision for London's municipal waste:

To become a world leader in municipal waste management

The Mayor's vision is that London will become a world leader in municipal waste management, utilising innovative techniques and technologies to minimise the climate change impact of municipal waste and to fully exploit its massive economic value. The aim is to reduce the amount of municipal waste generated by the capital, significantly increase recycling and composting performance, and to generate energy from rubbish that cannot be reused or recycled, in the most environmentally friendly way possible. The following objectives and targets aim to support this vision:

Objectives

1. To provide Londoners with the knowledge, infrastructure and incentives to change the way we manage municipal waste: to reduce the amount of waste generated, encourage the repair and reuse of items that are currently thrown away, and to recycle or compost as much material as possible.
2. To minimise the impact of municipal waste management on our environment including reducing the carbon footprint of London's municipal waste.
3. To unlock the massive economic value of London's municipal waste through increased levels of reuse, recycling, composting and the generation of clean energy from waste.
4. To manage the bulk of London's municipal waste within London's boundary, through investment in new waste infrastructure.

Targets

1. To achieve zero municipal waste direct to landfill by 2025.
2. To reduce the amount of household waste produced in 2008/09 from 970kg per household to 790kg per household by 2031. This is equivalent to a 20 per cent reduction per household.
3. To increase London's capacity to reuse or repair municipal waste from approximately 10,000 tonnes each year in 2008 to 40,000 tonnes a year in 2012 and 120,000 tonnes a year in 2031.
4. To recycle or compost at least 45 per cent of municipal waste by 2015, 50 per cent by 2020 and 60 per cent by 2031.

In addition to the above targets, the Mayor will set a greenhouse gas reduction target for London's municipal waste, following detailed waste modelling. This target will be set out in the public consultation draft of the Mayor's Municipal Waste Management Strategy in mid-2010.

To achieve the Mayor's objectives and targets, the strategy will focus on the following six policy areas, each containing a number of proposals:

Policy One: Informing producers and consumers of the value of reducing, reusing and recycling municipal waste

Reducing or preventing the amount of waste we produce is the most cost-effective and environmentally beneficial way to improve London's municipal waste position. With the number of households in London expected to increase by 22 per cent to 4 million by 2031, the Mayor is committed to ensuring population growth does not result in any more growth in the amount of household waste generated. The Mayor proposes a London-wide 20 per cent reduction in the amount of waste produced per household in 2008 by 2031. This equates to a one per cent per year reduction, in line with recent trends. The Mayor welcomes waste authorities setting their own waste reduction targets to help achieve his reduction target for London.

The Mayor believes he can best influence waste reduction and the value of reuse and recycling in London by supporting local and regional campaigns and initiatives. The London Waste and Recycling Board, chaired by the Mayor, has awarded £5 million funding between 2009 and 2012 to deliver a Londonwide reduction, reuse and recycling campaign.

The Mayor wants London to lead the way in waste reduction and believes that reducing the amount of unnecessary packaging through better product design and smarter purchasing habits is the key to achieving this. The Mayor will seek to work with London's businesses and manufacturers to deliver this.

The Mayor also wants to significantly boost London's reuse performance and will develop a strategic reuse network across London with third sector organisations and public bodies, supporting the repair and reuse of discarded materials.

Policy Two: Setting a greenhouse gas standard for municipal waste management activities to reduce their impact on climate change.

The Mayor wants the management of all London's municipal waste to achieve a positive carbon outcome, particularly for waste that currently goes to landfill or mass-burn incineration. The Mayor will set a greenhouse gas standard that municipal waste management activities and technologies will need to meet in order to get Mayoral support, rather than prescribing particular waste management activities or treatment technologies.

This approach will support waste activities and services that reduce the amount of municipal waste produced, and capture the greatest number and highest quality of materials for reuse, recycling or composting. This approach will rule out new traditional mass-burn

incineration facilities, and incentivise moving towards cleaner, efficient energy recovery technologies, including anaerobic digestion, gasification and pyrolysis. Generating clean, efficient energy from London's municipal waste in London will play an important role in meeting the Mayor's commitment to a target of a 60 per cent reduction in London's CO_2 emissions (on 1990 levels) by 2025.

Policy Three: Capturing the economic benefits of waste management

This strategy will focus on the economic opportunity that municipal waste in London presents. It is estimated £89 million a year in savings could be realised in London if municipal waste is managed in the optimal way. This represents a massive opportunity for London's waste authorities to share in these savings. Over the last 20 years there has been a tendency for waste authorities to outsource their waste functions. Outsourcing services means outsourcing risk and therefore providing fiscal certainty. However outsourcing risk can be expensive and any potential revenue from the sale of product in the form of recycled materials or energy is lost. The Mayor would like London's waste authorities to explore the opportunities for entering into revenue-sharing waste contracts and joint venture arrangements. Through the Mayor's chairmanship of the London Waste and Recycling Board, the board will make funding available to support waste authorities owning and operating their own facilities treating municipal waste.

Policy Four: Achieving 45 per cent municipal waste recycling or composting performance by 2015, 50 per cent by 2020, and 60 per cent by 2031.

The Mayor is keen to see that both waste authorities and the waste industry provide recyclable material to the processing and treatment markets, ensuring these materials maintain the best possible prices, highest quality use, and maximum resilience to market fluctuations.

This approach will need to be supported by the provision of high quality, consistent recycling services across London that make recycling hassle-free for the consumer, regardless of which borough or housing type they live in or where they work. The Mayor wants to work with waste authorities to ensure all Londoners can access a core set of cost-effective waste collection, recycling and composting services, particularly to flats and estates where recycling and composting performance is typically low. The Mayor proposes that the London Waste and Recycling Board consider a significant programme of Infrastructure improvement to boost recycling rates from flats, in particular from social housing estates.

Policy Five: Catalysing waste infrastructure, particularly low carbon technologies

London must manage as much of its municipal waste as practicable within London. The Mayor is keen that this has a particular focus on new low-carbon technologies where ever possible. The London Waste and Recycling Board has committed £74m to support reuse, recycling, composting, and energy infrastructure in London from 2009 to 2012 and it hopes to leverage

additional funding from other infrastructure funds and through private investment.

The board will play a significant role in the development of new municipal waste infrastructure in London, keeping the value of London's waste in the capital and achieving greater regional self-sufficiency. Waste apportionment and regional self-sufficiency will be addressed in the revisions to the Mayor's strategic plan for London - The London Plan. The Mayor, in revising his London Plan, is reviewing his self-sufficiency targets to manage London's municipal and commercial waste. The Mayor wants London's waste sites to move up the value chain, moving away from low-value bulking and transfer facilities to state-of-the-art resource recovery parks, providing benefits to local communities in the form of new products, employment, and heat and power. The board has the remit and membership to develop a London-wide site framework in partnership with waste authorities, bringing together data on current, planned, and potential waste sites at a local and regional level. The board can then set out what new facilities London needs, where they are needed, and when they are needed.

Policy Six: Improving Londoners' quality of life

The Mayor wants Londoners and visitors to enjoy a consistently high quality of life. One factor affecting quality of life is litter and cleanliness. Come 2012, the world's eyes will be on London and we must ensure that memories of London are not marred by litter.

Chewing gum is a particular blight and the Mayor will work with London boroughs and chewing gum manufacturers to minimise the impact chewing gum has on our local environment. The Mayor is keen for communities to develop a feeling of pride for the areas that they work and live in and will encourage community groups, boroughs, the third sector and businesses to get involved in cleaning up London.

The Mayor believes his policies and proposals will put London on the path towards achieving zero municipal waste to landfill by 2025, by which time the landfill sites currently used for London's municipal waste are expected to have closed. Today London relies heavily on the southeast regions for the majority of its landfill needs, with only 20 per cent going to London's own landfill sites in Rainham and Beddington. The Mayor has no desire to continue sending municipal waste to landfill outside London and will work with neighbouring counties to agree a roadmap for reducing London's exported municipal waste, aiming to achieve zero municipal waste to landfill by 2025.

The Mayor expects in the immediate future that landfill will continue to play an important role in the disposal of some municipal waste materials. Some materials, such as asbestos and other toxic waste, are currently only suitable for landfill, and for others, the technology is not yet there to reuse, recycle or recover energy from them.

Other Mayoral strategies

The Mayor is revising his London Plan and developing other Mayoral strategies including the Economic Development Strategy, Climate Change Adaptation Strategy, Climate Change

Mitigation and Energy Strategy, Transport Strategy, Water Strategy, and Air Quality Strategy. The Mayor's Municipal Waste Management Strategy will be consistent with relevant policies and proposals in these documents.

Next steps

The Mayor is consulting on this strategy with the London Assembly and GLA's Functional Bodies until 15 March 2010. At the same time he would welcome comments from stakeholders and the public via the on-line consultation questionnaire. This can be found at www.london.gov.uk. Alternatively a PDF version of the questionnaire can be downloaded and sent by post to:

Mayor's Municipal Waste Management Strategy Consultation
Post Point 19A
FREEPOST LON15799
City Hall
The Queen's Walk
London SE1 2BR

The Mayor will then consider the responses to the consultation and make any necessary changes to his strategy before publishing it for consultation with the public and stakeholders in mid-2010. The strategy will be published in its final form by winter 2010.

Endnotes

1 Greenhouse gases have different global warming impacts. For example, one tonne of methane is 23 times stronger than one tonne of CO_2. Sulphur hexafluoride is 23,900 times stronger than CO_2. A CO_2-equivalent figure is used to represent the warming impact of greenhouse gases

Legislative and policy context

The Mayor is required to produce and keep under review a Municipal Waste Management Strategy. The Mayor in developing his strategy has to be consistent with the government's Waste Strategy, which sets out the government's approach for the UK to achieve its commitments under the 1999 European Landfill Directive. To comply with the Landfill Directive, the UK must meet the following stringent targets on the amount of biodegradable municipal waste (BMW) that can be landfilled:

- 75 per cent of that produced in 1995 by 2010
- 50 per cent of that produced in 1995 by 2013
- 35 per cent of that produced in 1995 by 2020

In April 2005 the government introduced the Landfill Allowance Trading Scheme (LATS) providing the mechanism for UK local authorities to reduce the amount of BMW sent to landfill in order for the UK to achieve the European Directive landfill diversion targets. Under LATS, each waste disposal authority is given a landfill allowance, which decreases annually up to 2020, setting out how many tonnes of biodegradable municipal waste it can send to landfill.

The government's Waste Strategy 2007 sets the following targets for the UK:

- To reduce the amount of household waste not reused, recycled or composted in 2000 by 29 per cent in 2010 with an aspiration to achieve a 45 per cent reduction on 2000 levels by 2020
- Recycling and composting of household waste - at least 40 per cent by 2010, 45 per cent by 2015 and 50 per cent by 2020
- Recovery[1] of municipal waste - 53 per cent by 2010, 67 per cent by 2015 and 75 per cent by 2020.

In April 2008 the government introduced a set of 198 National Indicators (NIs) reflecting national priority outcomes for local authorities. The NIs replace Best Value Performance Indicators (BVPIs) previously set for local authorities. NI standards have been set for every UK local authority. There are four NIs directly relating to waste:

- NI 191 – Number of kilograms of residual waste (waste not reused, recycled or composted) collected per household
- NI 192 – Percentage of household waste sent for reuse, recycling, composting or anaerobic digestion
- NI 193 – Percentage of municipal waste sent to landfill
- NI 195 - Percentage of land surveyed that is of a poor or unsatisfactory standard of cleanliness.

Local authorities meeting their standards set for NIs 191,192 and 193 would deliver the government's national targets set out in the Waste Strategy 2007.

There are also two climate change indicators relevant to carbon dioxide emissions from local authorities undertaking their waste functions:

- NI 185 - Percentage CO_2 reduction from local authority operations
- NI 186 - Per capita reduction in CO_2 emissions in the local authority area.

The government has not set any targets for London or any other UK region to achieve.

London's first Municipal Waste Management Strategy waste was published in 2003. In addition to the increase in landfill tax, introduction of LATS, NIS, and the government's waste targets, there have also been a number of other significant policy developments, making it timely for a new Municipal Waste Management Strategy. These policy developments include:

- Revisions to the European Waste Framework Directive, which require Member States, including the UK, to bring into force its laws, regulations and administrative provisions by 12 December 2010. The revisions are summarised in Appendix One.
- New provisions in the GLA Act 2007, which require the London waste authorities to act in 'general conformity' with the Mayor's Municipal Waste Management Strategy, and a new duty on the Mayor to tackle climate change.
- The creation of the London Waste and Recycling Board, which must 'act in accordance' with the Mayor's Municipal Waste Management Strategy. The board was set up in September 2008 with funding of £84 million from both national government and the London Development Agency. The objectives for using the fund in London are to promote and encourage a reduction in waste, to increase the proportion that is reused or recycled, and to use methods of collection, treatment and disposal of waste that are more beneficial to the environment.
- The waste policies in the London Plan (currently being revised) which require boroughs to plan for their waste by identifying suitable sites.

Appendix One summarises the key legislation taken into consideration when developing the Mayor's Municipal Waste Management Strategy.

The government is reviewing its Waste Strategy 2007 and recently announced its plan for Britain to become a zero waste nation. Key elements of the government's plan[2] include:

- England should more than halve the amount of waste going to landfill in the next 10 years. In 2010, the Department for Environment, Food and Rural Affairs (Defra) will consult on what recyclable and compostable items should be banned from landfill and how a ban would work.
- In ten years time, 75 per cent of household waste will either be recycled or used for energy, and over time, this figure will increase even further.
- Six new Zero Waste Places in parts of Shropshire, Dorchester, Brixton, Newham, Hoxton and Suffolk will be created to develop innovative ideas to cut waste in the home, workplace and community. A new Zero Waste Places Standard for local authorities will also recognise areas that go above and beyond national waste targets while supporting them with small grants for further development.
- The government expects local authorities to offer a full collection service for all recyclable items by 2020. This should

include paper, card, cans, glass and plastic bottles, food and packaging. Defra will encourage local authorities collecting food waste to make use of the technology and funding available to them to harness the power of energy from waste.

- The government is changing the approach for calculating the EU Landfill Directive targets to reduce the amount of BMW sent to landfill. The new approach will include much more commercial waste than currently and will bring the UK approach into line with the general approach adopted by other EU Member States. Changing the way municipal waste is counted will mean amending the baseline on which the landfill diversion targets were set, and thus the 2010/2013/2020 targets for the UK. The government plans to consult on any subsequent impact this may have on the LATS in early 2010.
- The government is proposing increasing landfill tax for incineration bottom ash from £2.50 per tonne to the standard landfill tax rate of £40 per tonne.

Implementing the Mayor's policies and proposals and achieving targets

The Mayor's strategy provides a strategic framework of policies and proposals that seeks to ensure London makes an effective contribution towards meeting the UK's commitments under the Landfill Directive 1999. The Mayor's policies and proposals aim to provide an indication to London's waste authorities on the actions it is expected they will need to undertake to meet and exceed their local targets.

The Mayor will work in partnership with London's waste authorities and other stakeholders to implement his strategy. However London's waste authorities are largely responsible for implementing the strategy through the delivery of local waste services and procurement of waste treatment capacity. London's waste authorities have to act in general conformity with the strategy when undertaking local waste functions. The Mayor's draft strategy for public consultation in mid-2010 will include a detailed implementation plan setting out how his polices and proposals will be implemented and monitored.

The Mayor has set his own targets for London's municipal waste, which are more ambitious than those set for the UK by government. The Mayor believes stronger targets than those set by government are necessary, in particular to reduce the amount of municipal waste produced, and to reduce the amount sent to landfill, to achieve greater environmental and economic benefits. The Mayor has not set municipal recovery targets. In line with the waste hierarchy[3], in most cases recycling or composting waste achieves the greatest environmental benefits, and therefore should be given priority over energy recovery by setting separate recycling or composting targets. The Mayor believes setting recovery targets may cause confusion for waste authorities on whether they should focus on contributing towards achieving the Mayor's recycling targets or recovery targets. Chapter One in this strategy sets out the Mayor's preferred approach for managing London's municipal waste to 2031 to achieve his targets.

The Mayor's preferred approach includes energy recovery from any waste remaining after reuse, recycling and composting options have been exhausted. The government's recovery targets are achieved as a result of this approach.

Appendix Two sets out how the Mayor's policies and proposals contribute towards achieving the Mayor's targets, and how achieving these targets meet or exceed London waste authorities' LATS requirements, and the government's national targets.

Endnotes

1 For the purposes of achieving this target, "recovery" of municipal waste includes recycling, composting and energy generation"

2 Taken from DEFRA press releases:
1) http://www.defra.gov.uk/news/2009/091013a.htm {Last accessed 2 December 2009}
2) http://www.defra.gov.uk/environment/waste/strategy/legislation/landfill/targets.htm {Last accessed 2 December 2009}.

3 See Policy 2.

1 Current performance on managing London's municipal waste

Waste management in London

Waste by composition

In 2008/09, London produced 3,975,000 tonnes of municipal waste, mostly made up of paper and board and organic waste (food and green garden waste). The breakdown of London's municipal waste is shown in Figure 1.

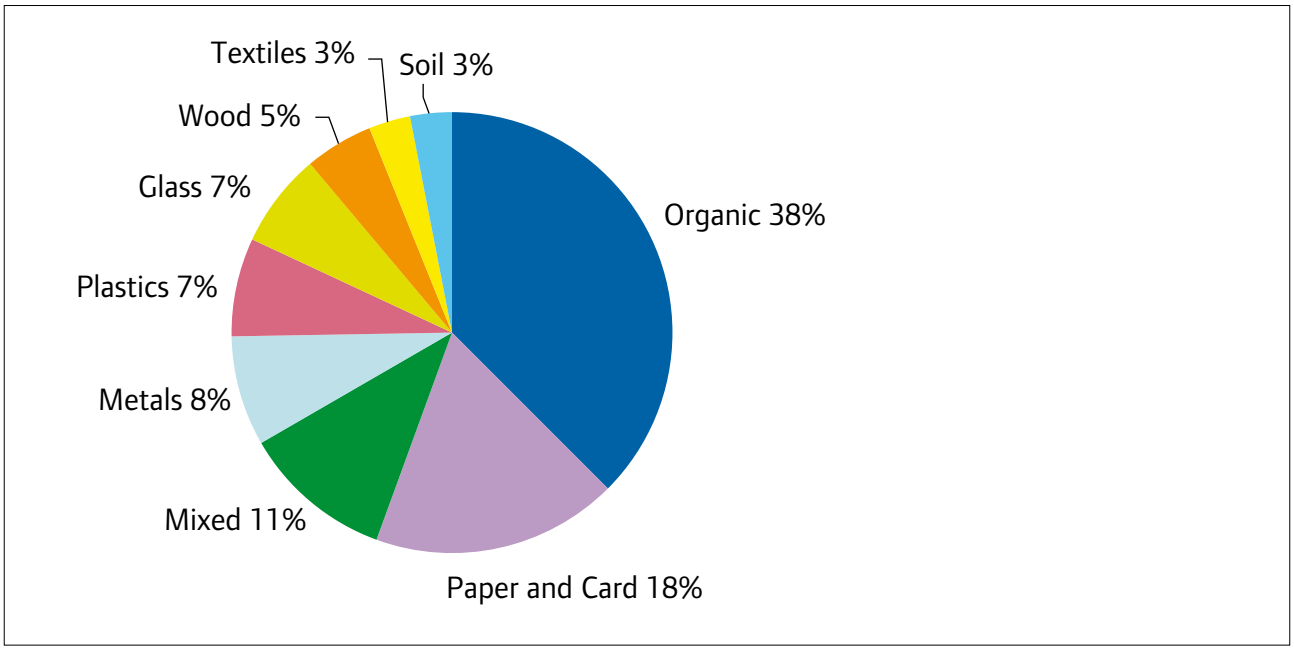
Municipal waste is waste collected by or on behalf of local authorities. Household waste makes up 79 per cent (3.14 million tonnes) of municipal waste and includes household refuse, recycling and bulky waste, street litter and park litter. The remaining 21 per cent (835,000 tonnes) comes mainly from grass cuttings and leaves in parks, council office waste and some small and medium-sized businesses where boroughs have waste collection agreements in place.

Management methods for London's municipal waste

In 2008/09, London sent 49 per cent (1.95m tonnes) of its municipal waste to landfill, and a further 23 per cent (914,000 tonnes) to incineration.

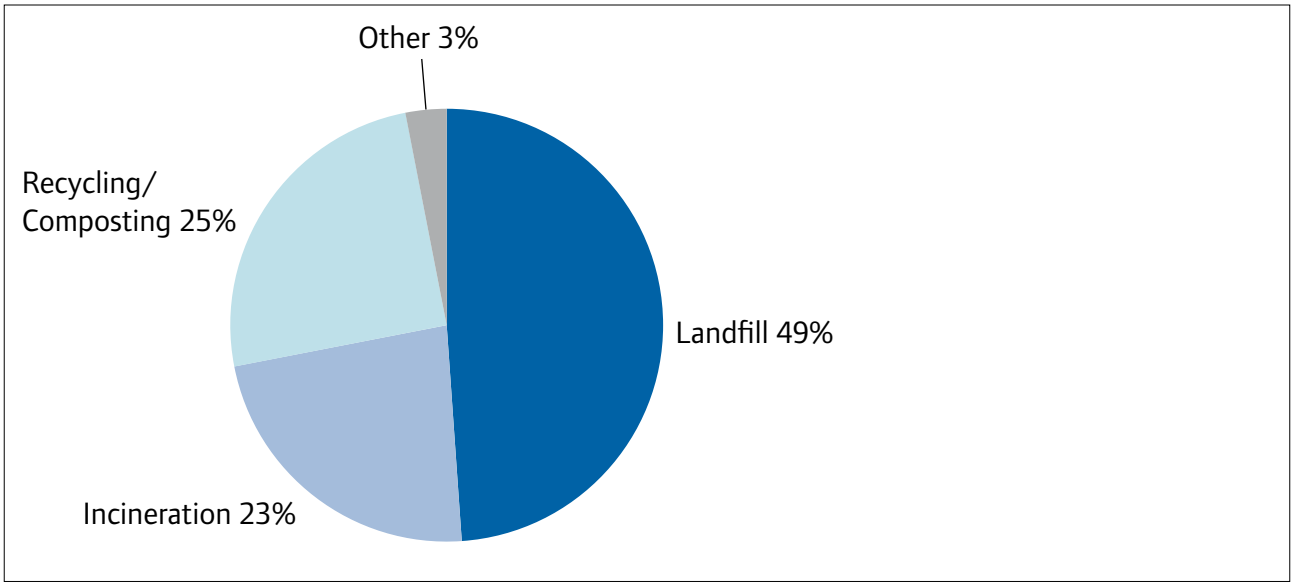
London's municipal recycling or composting performance has improved threefold since 2000/01, from 8 per cent to 25 per cent in 2008/09. Despite this considerable

Figure 1: Municipal waste by material produced in London in 2008/09 – total 3,975,000 tonnes



Source: Total waste arisings taken from Defra Waste Statistics, 2009, see www.defra.gov.uk/evidence/statistics/environment/wastats {Last accessed 16 December 2009}.Waste composition figures are based on household waste composition figures (making up 79 per cent of municipal waste) from the Waste Strategy for England 2007, Defra. 'Mixed' waste includes household sweepings and disposable nappies.

Figure 2: Breakdown of London's municipal waste by management method in 2008/09

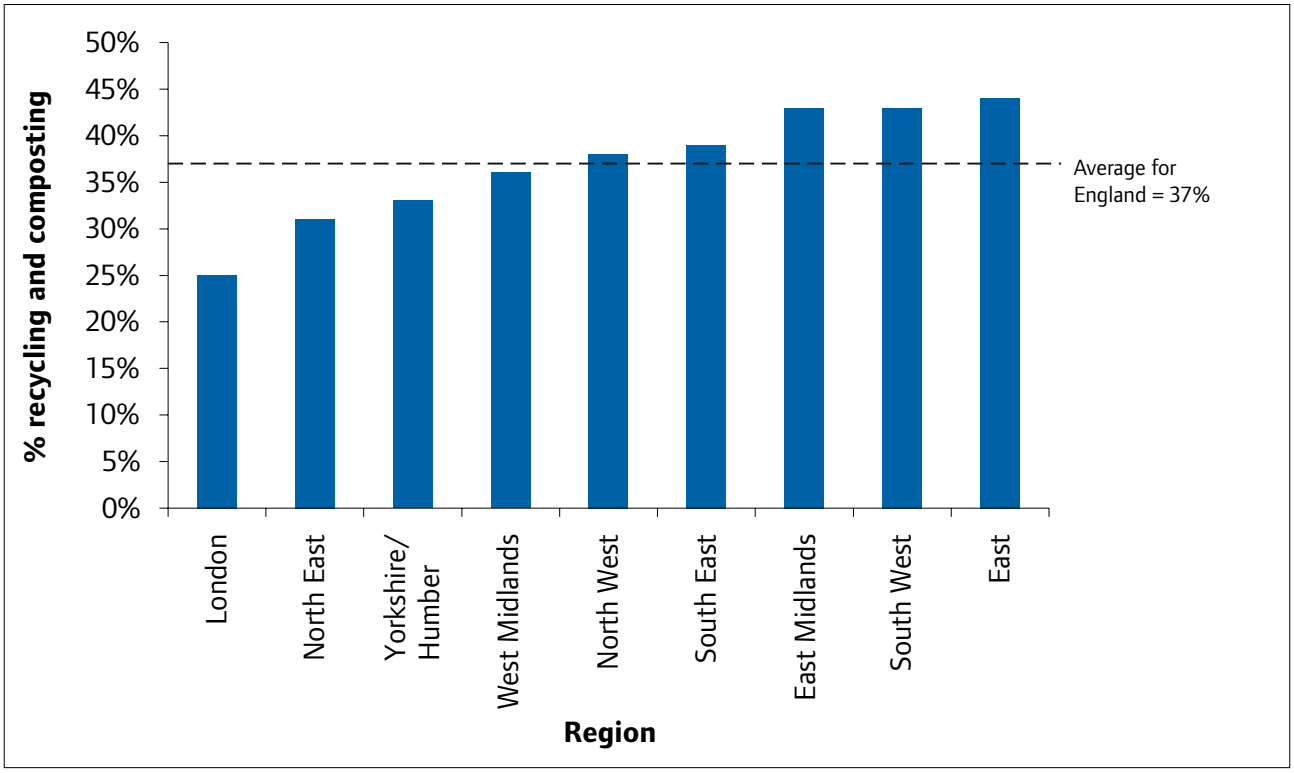


Source: Defra Waste Statistics, 2009, see www.defra.gov.uk/evidence/statistics/environment/wastats {Last accessed 16 December 2009}.
Notes: 'Other' is waste material sent for some form of pre-treatment or unknown destination. Recycling or composting includes organic waste sent for anaerobic digestion. Less than one per cent of London's municipal waste is treated using anaerobic digestion.

improvement, London is the worst performing region in England and well below the average for England of 37 per cent (see Figure 3). London also compares poorly on municipal recycling rates to other international cities like Berlin (41 per cent), New York (34 per cent) and Sydney (29 per cent), although it is better than Paris (19 per cent)[1]. Recycling and composting play an important role in climate change mitigation by avoiding greenhouse gas emissions that would otherwise have been produced in manufacturing from virgin materials.

London sends its municipal waste for incineration to its two mass burn incinerators at Edmonton and Lewisham, managing approximately 914,000 tonnes in 2008/09 and generating energy in the form of heat and electricity. Neither of London's mass burn incinerators use the vast amounts of heat generated, making this an inefficient energy generation process and releasing significant amounts of carbon dioxide. Research[2] undertaken for the GLA demonstrated incineration of mixed waste operating in combined heat and power mode (CHP) could be carbon neutral in that they displace as much CO_2 as they create. This is a result of avoiding CO_2 that would otherwise have been produced from generating the same amount of heat and electricity using fossil fuels, such as coal and gas. Heat makes up two-thirds of energy generated from incineration so capturing it would greatly improve the overall efficiency

Figure 3: England's regional municipal recycling or composting performance 2008/09



and carbon performance of London's existing incineration facilities. More information on reducing the climate change impact of London's municipal waste can be found in Policy 2 of this strategy.

London is second only to the West Midlands in the proportion of municipal waste sent for mass burn incineration. This proportion will increase when London's third mass burn incinerator at Belvedere comes online in 2011. The Mayor does not want any further increase in London's mass burn incineration capacity. He believes any further increase will crowd out recycling and provide little incentive for the development of emerging clean technologies.

Table 1: Waste management method by UK region 2008/09

Region	% landfill	% incineration	% recycling	% other
London	49%	23%	25%	3%
East	54%	2%	44%	0%
East Midlands	50%	7%	43%	0%
Northeast	52%	15%	31%	2%
Northwest	59%	3%	38%	0%
Southeast	46%	15%	39%	0%
Southwest	56%	0%	43%	1%
West Midlands	33%	32%	36%	0%
Yorkshire and Humber	56%	10%	33%	1%

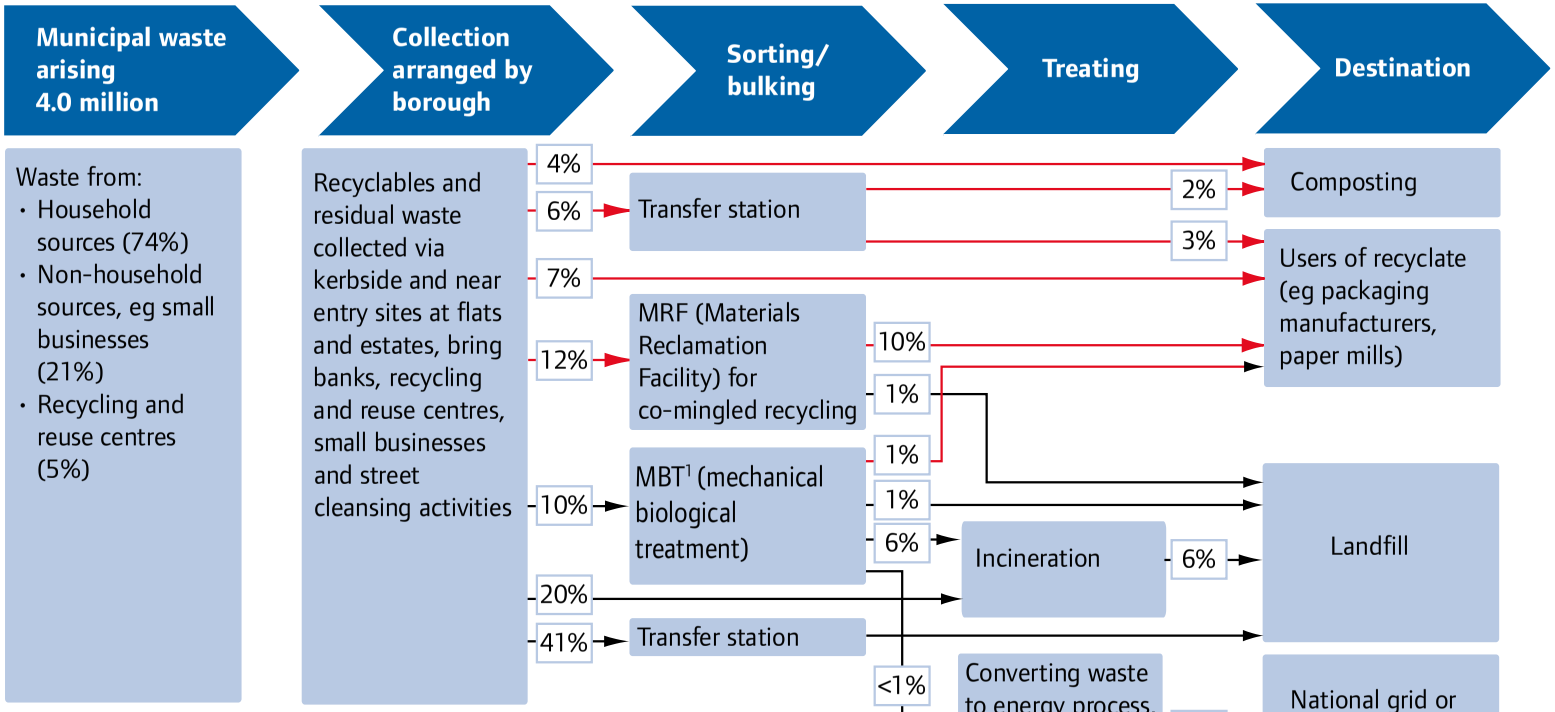
Source: Defra Waste Statistics, 2009
Note: "Other" includes small amounts of pre-treatment of waste.

London's municipal waste to landfill

London relies heavily on its surrounding regions for disposing of its waste to landfill. About 80 per cent of such waste goes to landfill sites outside London, mainly in the South and East of England. These regions are increasingly reluctant to accept London's waste and this landfill capacity is due to expire by 2025[3]. The remainder is sent to London's two municipal waste landfill sites in Rainham (Havering) and Beddington Farm (Sutton). However, these sites are expected to close by 2018 and 2021 respectively[4] with no new landfill capacity planned within London.

In addition to declining landfill capacity and the environmental problems landfill creates, it will become increasingly expensive to dispose of London's municipal waste this way, as landfill tax is to rise from £40 per tonne in 2009 to £72 per tonne by 2013.

Figure Four: London's municipal waste flows



Key — Recyclables waste flows; Residual waste flows

Notes: Numbers may not add up due to rounding

[1] Approximately 25 percent is lost as water during MBT

Figure 4 above shows that approximately 60 per cent of London's municipal waste goes direct to landfill or incineration, often without any form of pre-treatment to recover materials that could be reused, recycled or composted.

Approximately 40 per cent of municipal waste comes from flats and estates, which makes up about half of London's housing stock[5]. Almost 21 per cent is collected from small and medium-sized businesses, adding to the complexity of analysing and tracking municipal waste.

London's municipal waste arisings in 2008/09 were about five per cent lower than in 2007/08. However, they are expected to rise slightly again as London's population increases and London comes out of the recession, albeit at a slower rate than previously expected.

Research[6] undertaken for the GLA shows the majority of growth in municipal waste will come from an increase in the number of households, which is predicted to increase by 12 per cent by 2020 and 22 per cent by 2031 from the 2008 baseline of 3.2 million[7]. This means that, without any policy intervention, there will still be a small but steady increase in total municipal waste over time.

Municipal waste performance and governance framework

Although the responsibility for collecting waste in London has always been with boroughs, the responsibility for disposing of waste has been dispersed since the abolition of the Greater London Council (GLC) in 1986 (Figure 5).

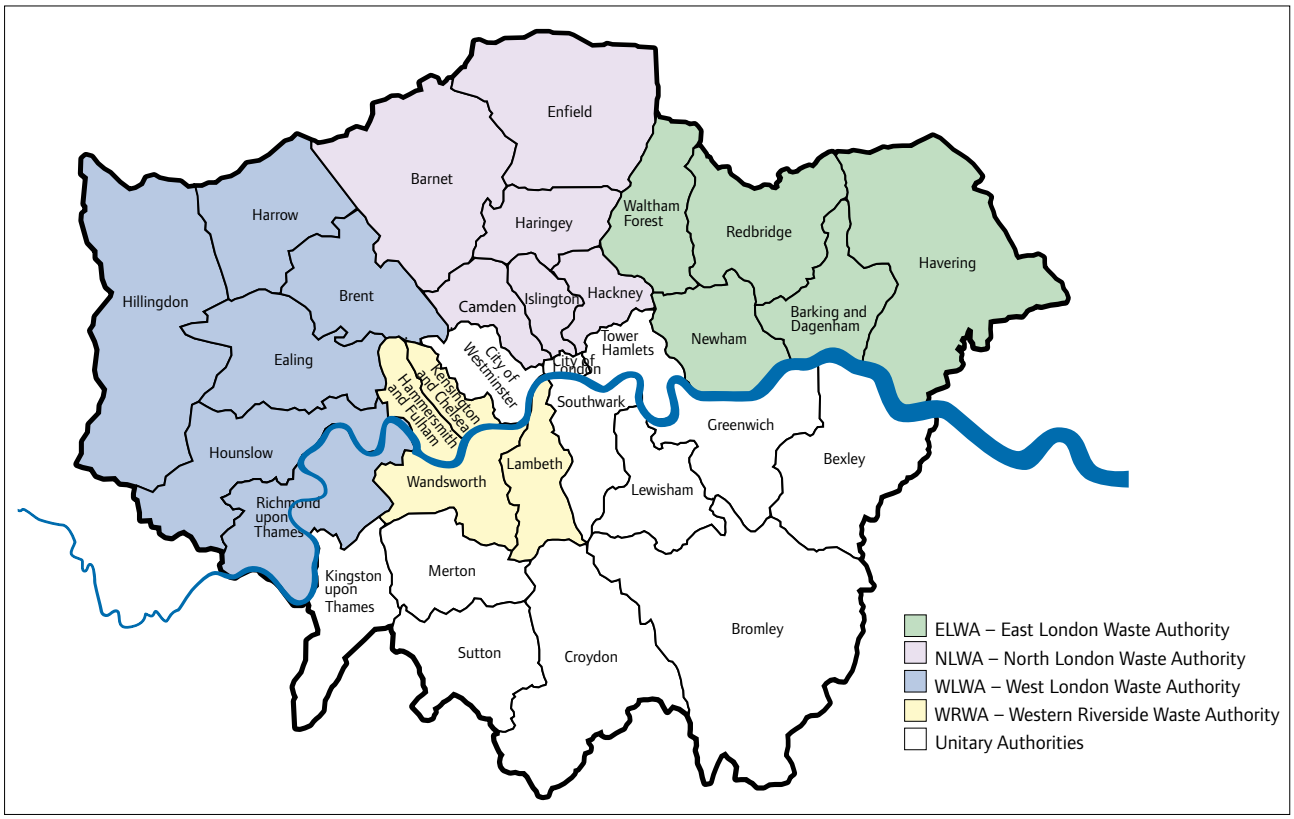
There are 12 boroughs in London that are responsible for both collection and disposal of their waste (and are known as unitary authorities). They are Bexley, Tower Hamlets, City of London, Westminster, Southwark, Lewisham, Greenwich, Sutton, Merton, Kingston, Croydon and Bromley. The remaining 21 London boroughs are responsible for the collection of their waste, but with waste disposal operations arranged across four statutory waste disposal authorities. These are:

- East London Waste Authority (ELWA – Newham, Redbridge, Barking and Dagenham, Havering);
- North London Waste Authority (NLWA – Camden, Islington, Hackney, Waltham Forest, Haringey, Barnet, Enfield);
- Western Riverside Waste Authority (WRWA – Kensington and Chelsea, Hammersmith and Fulham, Wandsworth, Lambeth);
- West London Waste Authority (WLWA – Richmond upon Thames, Hounslow, Ealing, Brent, Harrow, Hillingdon).

Improving London's municipal waste position

London needs to firstly reduce the amount of municipal waste generated, and then move away from its reliance on landfill and incineration. This can be achieved by significantly increasing the amount of waste reused, recycled and composted, and generating renewable energy from the remaining waste. It is particularly important that London stops sending mixed untreated or unsorted waste to landfill or incineration.

Figure 5: London's Unitary, Waste Collection, and Disposal Authorities



Source: GLA, 2009.

In preparing this draft strategy the GLA has modelled a number of different scenarios for London to make an effective contribution towards meeting the UK's commitments under the Landfill Directive 1999. The model considers various options for managing London's municipal waste including landfill, recycling, composting, anaerobic digestion, mass burn incineration and new waste to energy technologies. Judging the outcomes of the model against a number of criteria and sensitivities, a preferred approach (the Mayor's preferred approach) is selected. Such criteria and sensitivities include: -

- Achieving a reduction in the amount of municipal waste produced
- Achieving high recycling and composting performance
- Achieving London waste authorities' LATS requirements
- Achieving government targets set for the UK
- London waste authority contractual requirements for using existing waste facilities
- The GLA's knowledge of new waste infrastructure London's waste authorities are planning for in the near future.
- Time necessary to plan, procure, build and operate new waste facilities

- Estimated cost and benefits of waste management options
- Availability and environmental performance of waste management options, including their climate change impact.

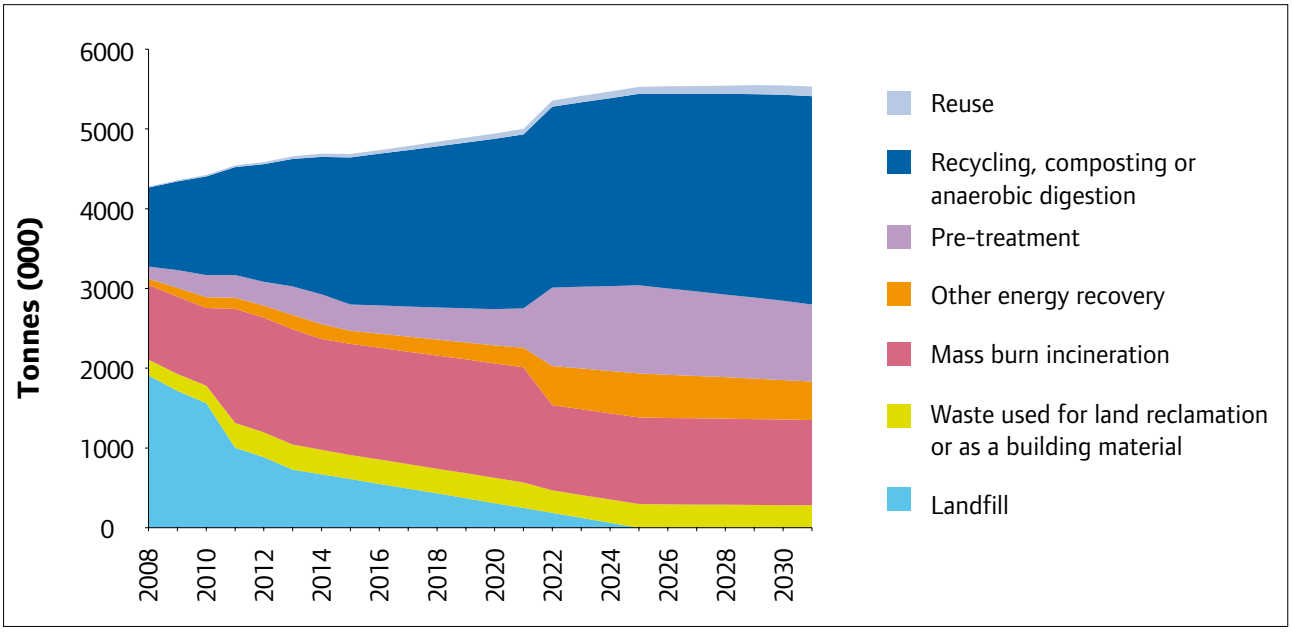
The Strategy applies the same growth rate used to update London's municipal waste arisings set out in the 2009 minor alterations to the Mayor's Strategic Plan for London; the London Plan. More information on the minor alterations can be found at http://www.london.gov.uk/mayor/planning/london-plan-review/alt-dec09.jsp.

The Mayor's targets in the Introduction of this strategy have been set based on the modelling undertaken in order to determine the Mayor's preferred approach. Figure 6 illustrates the Mayor's preferred approach and estimated waste infrastructure capacity required for London to achieve his waste targets.

Policies One to Five in this strategy set out how London can achieve the Mayor's preferred approach, including the development of the waste infrastructure necessary for London to achieve higher recycling or composting performance and become more self-sufficient. In achieving the Mayor's preferred approach it is assumed that:

- There will be no overall increase in total household waste generated in 2008/09 by 2031. The Mayor hopes his waste reduction policy and proposals will off-set any growth in household waste. A particular focus will be on reducing the amount of waste produced per household (Policy 1).
- Waste reuse infrastructure capacity will increase from 10,000 tonnes a year in 2008/09 to 120,000 tonnes a year by 2031 (Policy 1).
- Diverting waste from landfill through increased levels of reuse, recycling, composting, and generating energy more efficiently will achieve significant greenhouse gas savings, resulting in a carbon positive outcome (Policy 2), and better capture the economic benefits for London from this approach (Policy 3).
- There will be a step change in London's municipal waste recycling or composting performance to achieve 45 per cent performance by 2015, 50 per cent by 2020 and 60 per cent by 2031 (Policy 4).
- More capacity will be needed for many different aspects of dealing with municipal waste by 2031, particularly in the sorting of materials for recycling, and for reprocessing, composting and anaerobic digestion (Policy 5).
- There will need to be a significant increase in new waste pre-treatment infrastructure capacity to recover as many materials as possible for recycling from mixed waste, with the remaining waste turned into fuel for energy generation. It is assumed that pre-treatment capacity will need to increase from 244,000 tonnes per year in 2008/09 to 1.2 million tonnes in 2025. Demand for pre-treatment capacity is then expected to drop to about 1 million tonnes per year by 2031 as recycling and composting performance increases, reducing the quantity of mixed waste requiring treatment. (Policy 5).
- There will be a steady increase in the capacity of new energy recovery infrastructure for

Figure 6: The Mayor's preferred approach for managing London's municipal waste to 2031



Source: GLA, 2009.
Notes:

- Recycling, composting or anaerobic digestion performance includes anaerobic digestion of separately collected organic waste.
- "Pre-treatment" includes processes such as mechanical biological treatment and autoclave that recover materials for recycling and prepare a solid recovered fuel (SRF) from remaining waste for energy generation.
- "Other energy recovery" refers to advanced conversion technologies including anaerobic digestion, gasification and pyrolysis. It could also include small scale incineration of organic waste operating in combined heat and power mode.
- "Mass burn incineration" refers to incineration of mixed untreated waste generating electricity only (i.e. not using waste heat).
- As some waste is expected to go through several processes (for example, pre-treatment), the overall capacity required is greater than total waste arisings.
- Modelling is indicative only and focuses on a limited number of sensitivities. The GLA intends to explore more sensitivity analysis using wide ranges of potential variation and assumptions for the development of this strategy.
- See Appendix Three for key assumptions of waste flows and waste sources.

converting waste into energy, reaching approximately 600,000 tonnes a year by 2025, with a particular focus on combined heat and power (Policy 5). The Mayor expects new energy recovery capacity to be taken up using advanced conversion technologies such as anaerobic digestion, gasification and pyrolysis. Demand for new energy recovery facilities is then expected to decline to about 530,000 tonnes per year as recycling and composting increases.

- With the exception of the Belvedere incinerator, it is assumed there will be no more mass-burn incinerators in London, and that

the Edmonton incinerator will close by 2020, having reached the end of its life. The Mayor wants no increase in mass-burn incinerators in London as he feels this will crowd out recycling and provide little incentive for the development of emerging cleaner technologies. The Mayor expects London's incinerators to utilise waste heat generated by 2031 and move towards incinerating non-recyclable waste only (Policy 5).

- The Mayor's policies and proposals will put London on the path to achieving zero municipal waste to landfill by 2025, particularly zero untreated waste to landfill. Some of this waste such as incinerator bottom ash and other wastes from treatment processes, are already used as building materials and for land reclamation, and these amounts are expected to increase slightly to 2031. Today landfill is the only suitable disposal method for some wastes such as asbestos and toxic mixed waste. The Mayor expects the amount of municipal waste currently only suitable for landfill (about 10 per cent) will decline as waste treatment and recovery technologies improve.

The GLA is undertaking further economic and environmental modelling of waste management scenarios following new data. The new data, along with consultation responses from the first draft, will be used to update the Mayor's preferred approach in developing the next draft of this strategy for public consultation in mid-2010. The results from the updated modelling will be included in a separate evidence base document published alongside the next draft strategy.

Endnotes

1 GLA survey, 2008. Note: differing governance arrangements for municipal waste in other cites makes direct comparison on recycling rates difficult.
2 Greenhouse gas performance of waste management scenarios, GLA, January 2008.
3 Source: East of England landfill capacity: East of England RTAB (2002) East of England Regional Waste Management Strategy (consultation draft) Table 12 and 14. South East England landfill capacity report: http://www.southeast-ra.gov.uk/sustain_publications_research.html {Last accessed 27 November 2009}
4 Source: GLA Planning Decisions Unit, 2009
5 http://www.ons.gov.uk/census/index.html. {Last accessed 18 December 2009}.
6 "Future waste arisings in London 2009-2031", GLA, Dec 2009
7 Source: GLA, 2009

2 Policies and proposals

Policy 1: Inform producers and consumers of the value of reducing, reusing and recycling.

Vision

Consumers understand and respond to the value of reducing, reusing and recycling municipal waste.

From vision to policy

The Mayor, working with local authorities, the third sector, businesses and the waste industry will promote the reduction, reuse and recycling of municipal waste, with the aim of decreasing the amount of municipal waste produced.

From policy to action - proposals

Setting waste reduction and reuse targets

- The Mayor will set a London-wide household waste reduction target equating to 10 per cent per household by 2020 increasing to 20 per cent per household by 2031, based on 2008/09 household waste arisings.
- The Mayor will set a target to increase the amount of London's municipal waste that could be reused or repaired from 10,000 tonnes each year in 2008 to 40,000 tonnes a year in 2012 and 120,000 tonnes a year in 2031

Supporting Londonwide campaigns and initiatives to promote municipal waste reduction, reuse and recycling

- The Mayor will work with WRAP (Waste Resources Action Programme), London boroughs and the London Community Recycling Network to re-launch Recycle for London as a programme of waste reduction, reuse and recycling campaigns targeting both consumers and producers.
- The London Waste and Recycling Board has provisionally allocated roughly £8.5 million across the life of the board fund (2009 to 2012) to support reuse infrastructure[1].
- The Mayor will work with London boroughs, the London Waste and Recycling Board and the London Community Recycling Network to develop a London Reuse Network, promoting waste reduction and reuse initiatives in the third sector, such as furniture reuse schemes, which can support and supplement existing local authority waste collection services.

Supporting Zero Waste Places

- The Mayor, through Recycle for London, will promote Zero Waste Places projects in London as a means to showcase best practice and encourage London boroughs to participate in the scheme.

Reducing the amount of municipal waste entering the waste stream

- The Mayor will work with businesses through the Mayor's Green Procurement Code and the Green 500 to agree a Charter on reducing municipal waste.
- The Mayor will identify leading businesses to work with the London Waste and Recycling Board as a network of mentors to small businesses wanting to improve resource efficiency and reduce waste.
- The Mayor will work with business to hold a packaging and product design competition aimed at "designing out" waste from the start.

What this will achieve

Overall these policies will help reduce the amount of municipal waste to be managed by informing producers and consumers of the value of waste reduction, reuse and recycling. As an example, a Love Food Hate Waste campaign, delivered in London by Recycle for London, can inform smarter purchasing choices to reduce the amount of food bought and then thrown away uneaten. WRAP estimates UK households buy and throw away approximately 8.3 million tonnes of food and drink each year costing about £12 billion. This is equivalent to about £480 for each household[2].

The best option is to prevent waste from entering the waste stream in the first place. Using the Mayor's Green Procurement Code and the Green 500, the Mayor will influence business and help them reduce this element of municipal waste at source.

Based on the GLA projected increases in the number of households to 2031[3], the Mayor has set a waste reduction target of 10 per cent per household by 2020 increasing to 20 per cent per household by 2031 (based on 2008/09 household waste arisings). If achieved, the Mayor's household waste reduction targets will result in no overall increase in the amount of household waste produced over the next 22 years, despite an increase in population. This means that in 2031, London will produce the same amount of household waste as in 2008/09, despite an additional 753,000 households.

Reduction and reuse of municipal waste will also deliver significant savings to London's waste authorities, which will avoid some treatment and disposal costs. We estimate that London waste authorities spend approximately £600 million a year managing London's municipal waste. Every one per cent of London's waste that is reduced or reused can save London up to £6 million.

While the exact benefits of these policies can be difficult to quantify, the Mayor will put in place specific key performance indicators and monitoring programmes to track the success of campaigns and initiatives. As an example, Recycle for London has set a provisional target to reduce 68,400 tonnes of uneaten food waste produced from London households by 2013[4]. Avoiding this food waste instead of sending it to landfill could save approximately 166,000 tonnes of carbon dioxide equivalent emissions.

A well resourced, co-ordinated and publicised London Reuse Network could divert up to 1.7 million reusable household items from landfill each year, representing approximately 40,000 tonnes of waste. It could also cut £5 million off London's waste bill. Increased levels of reuse and repair could also have many social benefits, such as creating jobs, increasing local training and development and alleviating poverty.

There can be positive changes in behaviour when campaigns and initiatives for reduction, reuse and recycling are well integrated, and targeted at producers and consumers. Such campaigns will play an important role in boosting recycling performance in order to achieve the Mayor's target of 45 per cent municipal recycling or composting performance by 2015, 50 per cent by 2020, and 60 per cent by 2031.

Why we need change

Using our resources more efficiently reduces waste, and therefore reduces costs and environmental impacts. There are two main aspects to this:

- Improving London's resource efficiency – reducing the amount of materials used through waste prevention, reuse and recycling.
- Reducing the contribution of waste to London's greenhouse gas emissions – notably methane from landfill sites but also CO_2.

Reduction

Waste reduction, or prevention, is by far the most cost-effective and environmentally beneficial way to reduce the impact that waste has on the environment. However the Mayor believes that work to genuinely reduce and reuse waste must also be led nationally, if it is to be driven higher up the waste agenda.

Between 2003/04 and 2008/09, London's municipal waste arisings have actually decreased from 4.3 million tonnes to 4.0 million tonnes, despite an increase in population from 7.39 million[5] to 7.52 million[6] over the same

period. There are a number of possible reasons for this including:

- More restrictions on the trade waste accepted at household waste reuse and recycling centres
- Direct and indirect education on waste reduction, such as smarter shopping campaigns to reduce waste, using real nappies, and home composting
- Reducing waste and recycling collection services to small businesses

Smart Shopping campaign – The London Borough of Richmond

In February 2008, The London Borough of Richmond ran a local "smart shopping" campaign which encouraged shoppers to prevent waste through their purchasing decisions.

Officers from the recycling team set up "smart shopping" stalls outside supermarkets in Teddington and Twickenham, giving out leaflets with tips on how to avoid goods with excessive packaging, using a "bag for life" or reusable cotton shopping bags and avoiding the purchase of disposable items (such as cups, napkins and razors). Smart shopping advice was also posted on the borough's website. Around 900 re-usable shopping bags were distributed at the supermarket during the campaign. If all UK shoppers cut out just one in five carrier bags, it would save about 40,000 tonnes of CO_2 equivalent greenhouse gases a year – equivalent to taking over 12,500 cars off the road for a year[8].

- Changes to consumer packaging, such as the use of lighter materials (e.g. plastic or Tetra Pak in place of glass).

Despite these reductions, there is still too much waste being produced unnecessarily and not enough being reused, repaired or recycled. Instead it ends up in landfill where its value rots away.

Research[7] undertaken for the GLA showed that London boroughs are undertaking a range of waste reduction and reuse initiatives, including "smart shopping" – reusing shopping bags and buying products with less or no packaging; home composting; and real nappies. There is an opportunity through an integrated regional reduce, reuse and recycling campaign to better co-ordinate these programmes across boroughs.

Zero Waste Places

Zero Waste Places is a Defra initiative, delivered by the BREW Centre for Local Authorities and supported by the University of Northampton. "Zero waste" seeks to prevent waste occurring, conserve resources and recover all value from materials. Zero Waste Places can range in size from a small street market, to a retail park, high street, village, town or a whole authority. The Mayor will support Zero Waste Places projects in London and encourage more London boroughs to participate in the programme.

The objective of the initiative is to identify barriers and illustrate solutions that will help others to adopt the most effective approach to zero waste. Defra made £140,000 of funding available to fund Zero Waste Places pilots.

During 2008/09, six places were selected as Zero Waste Places projects, two of which were in London – Brent Green Zones (See Brent Case Study below) and Lewisham Green Street. These two received £25,000 in funding. A further six projects were selected in 2009/10, three of which are in London boroughs – in Lambeth, Hackney and Newham.

A Zero Waste Places Standard has also been established which provides recognition of and stimulation to the work of communities for their efforts at driving waste out and maximising the use of resources in their localities. Applicants are eligible for a further £3,000 under the standard to expand Zero Waste Places projects geographically or to improve existing schemes.

Reuse

Research[9] undertaken by the London Community Recycling Network for the GLA estimates London households throw away 1.7 million reusable household items every year (furniture, appliances and small household effects). By contrast the London Community Recycling Network estimates 170,000 reusable items were collected from households by the 31 principal reuse organisations in London that measured their tonnage in 2008. This represents about 4,000 tonnes of perfectly good products diverted from landfill. The total figure for London can be roughly calculated at 10,000 tonnes, using the London Community Recycling Network information to estimate the number of items collected by the reuse organisations that did not measure tonnage.

Lack of funding was identified as the key constraint to achieving better waste reduction and reuse in London.

The reuse sector plays an important role in creating jobs and alleviating poverty in London. The sector employs about 450 staff and 1,500 volunteers and trainee placements. In 2008, 16,000 households living in poor conditions were helped by the provision of furniture and appliances, after referrals by social workers and housing officers.

The reuse sector is keen to do more but faces a number of barriers. These include the inability to react quickly to fluctuations in supply and demand and the lack of a strong marketing voice promoting the economic and social benefits of buying used or restored items. Without an operational reuse network in London, most reuse organisations are unable to tackle these problems.

Recycling

A Recycle for London survey in March 2009 showed 87 per cent of Londoners believed they recycled 'a lot' or 'everything', yet the city's municipal recycling rate stands at just 25 per cent. Recycling campaigns now need to help consumers turn this claimed behaviour into real action, by showing that recycling is worthwhile (such as by explaining the 'journey' of a material from the recycling point to its use as a new product) and by providing the practical information that Londoners need to recycle more. Co-ordinated Londonwide campaigning, synchronised with national and local activity, is a key element in achieving this.

What needs to be done

The Mayor believes promoting smarter, better-informed purchasing habits and less packaging in product design is the most effective way to cut down on London's unnecessary municipal waste. The Mayor feels he can best influence waste reduction and increase awareness of the value of waste reduction, reuse and recycling in London in these areas by supporting local and regional campaigns and initiatives. The Mayor wants London to lead the way in waste reduction but believes waste reduction actions need to be taken nationally as well, to be most effective. The Mayor will write to the government proposing a set of measures that can be adopted to reduce waste generation and offering his assistance in promoting, trialling and enhancing these measures in London.

The Mayor is also committed to working more closely with manufacturers and retailers to reduce packaging and he will develop a programme of action on this over the next 12 months. Feedback and suggestions are welcomed. The programme may include:

- working with businesses, through the Mayor's Green Procurement Code and the Green 500, to agree a Charter on reducing municipal waste
- identifying leading businesses to work with the London Waste and Recycling Board as a network of mentors to small businesses wanting to improve resource efficiency and reduce waste
- setting up a packaging and product design competition to encourage young talented designers to "design out" waste.

The Mayor wants to set a Londonwide target to reduce household waste by 10 per cent per household by 2020, increasing to 20 per cent per household by 2031, based on the levels of household waste produced in 2008/09. These targets are consistent with decreasing levels of London's household waste since 2006, which have fallen on average by one per cent year on year since 2006. The Mayor's targets also reflect what he believes he can achieve by engaging with manufacturers and retailers, and by delivering Recycle for London to reduce household waste. London's household waste in 2008/09 was five per cent lower than that was produced in 2007/08, although this could have been inflated by the recession affecting consumption levels. The Mayor welcomes London's waste authorities setting their own waste reduction targets to achieve the Londonwide target. The Mayor is interested in hearing views on proposed reduction targets and how they could be measured.

Supporting Londonwide campaigns to promote the reduce, reuse and recycle message

The London Waste and Recycling Board has provisionally allocated £5.6 million of its £84 million fund over the next three years for waste reduction, reuse and recycling campaigns, as set out in its 2009/10 Business Plan. £5 million of this will part-fund a £8.3 million, three-year, Londonwide programme, with WRAP and other partners on waste reduction, reuse and recycling from 2009.

The Mayor will work with WRAP, the London boroughs and the London Community Recycling Network to re-launch Recycle for London with

an increased emphasis on waste reduction and reuse, in addition to recycling, and aiming for a wider audience, reaching out to producers and consumers.

Recycle for London will set waste reduction targets and concentrate on the materials that are most suitable for reduction, reuse and recycling. This includes food, paper and card, plastics, metals, textiles and glass, all of which are commonly collected through household and business recycling services. The Mayor will work with WRAP and other stakeholders to deliver campaigns, including a Love Food Hate Waste campaign, and will seek to work with London Community Recycling Network on a communications programme around furniture reuse as part of the Recycle for London programme.

An important element of the Recycle for London campaigns is that they will support localised communications, targeting specific audiences with the information they need and enhancing services offered by the boroughs.

Specific performance indicators and monitoring systems will be put in place to track progress. For example, to reduce food waste, a target might be for ten percent of London's households to become 'Committed Food Waste Reducers'[10]. This equates to 300,000 households by March 2013 – achieving a 76kg reduction in uneaten food waste per household per year, or a total of 68,400 tonnes over the life of the campaign (2009 to 2012). Avoiding sending this food waste to landfill could save approximately 166,000 tonnes of carbon dioxide equivalent emissions.

Supporting Zero Waste Places schemes

The Mayor will promote Zero Waste Places projects in London through the Recycle for London campaign, as a way of showcasing best practice and encouraging London boroughs to participate in the scheme.

Promoting London's reuse and repair network

The London Waste and Recycling Board has provisionally allocated £8.5 million across the life of the fund (2009-2012) to support reuse infrastructure. More information on supporting waste infrastructure in London can be found in Policy 5. The Mayor, through his role as chair of the board, will support and champion bids from the third sector to ensure that appropriate reuse and repair facilities and programmes are developed in London.

The Mayor will work with the London Community Recycling Network and the London reuse and repair networks in London (including furniture reuse schemes, Freecycle, and Myskip) to develop a map of reuse facilities across the capital which will then be promoted through Recycle for London's website postcode locator. This will help ensure that Londoners can easily access local reuse and repair opportunities.

The Mayor will encourage local authorities to work with the third sector when developing their waste contracts, using local reuse and repair schemes to add value to existing local authority services, where appropriate. For example,

Case study: Zero Waste Places Pilot – London Borough of Brent Green Zones Project

As part of Defra's Zero Waste Places pilot initiative, 11 streets in the London Borough of Brent are working towards becoming a Green Zone, with six of them meeting the criteria for Green Zone acknowledgement already. This criteria is:

- at least 65 per cent of residents:
  - regularly recycle
  - know they can, and regularly do, recycle at least five separate materials streams
  - use their organic waste bin regularly for at least two separate materials streams
- residents have at least three energy-efficient light bulbs used in their household
- over 70 per cent of residents use some water saving device (like a 'Hippo'), and
- at least one alternative transport method to the car is used regularly by over 30 per cent of households.

The Green Zones scheme was Highly Commended at The Future Friendly Awards and Commended at the Government Business Awards. As a result:

- sponsors of the awards – Waste Watch, the Energy Savings Trust and Water Wise - have offered their support to the Green Zones
- the profile of the scheme has been raised and more residents subsequently wanted to take part
- they gained further media coverage, including an article in the national print media
- Brent was able to produce a film to put across its message for the Green Zones, with the funding of the Future Friendly Awards (www.brent.gov.uk/streetcare2.nsf/Green%20Zones/LBB-306)

Case study: Freecycle/Freegle

The Freecycle Network is a private, non-profit organisation which provides an online resources exchange scheme, where users exchange unwanted items using the online board posting and email service. Membership is free, and everything posted must be free, legal and appropriate for all ages. Members wanting to 'offer' an item can send an email to their group or if looking to acquire something, members can post a 'wanted' message on the online information board. Once an exchange is completed members are encouraged to alert the group with a follow-up 'received' email.

The Freecycle concept has spread to over 85 countries. The first Freecycle group in London was set up in October 2003. There are now 38 active Freecycle groups in London, divided along local authority boundaries. There are currently 240,562 members exchanging approximately 564,166 items each year. A UK Freecycle group, 'Freegle', was set up in August 2009. The scheme operates in the same way as Freecycle but was set up to give UK Freecycle groups more autonomy from the US based Freecycle. Approximately half of London's local authorities now operate under the Freegal brand, with the remaining half using Freecycle.

furniture reuse schemes could be integrated with bulky waste collections.

The Mayor believes a reuse target for London's municipal waste of around one per cent by 2012, increasing to three per cent by 2031 is challenging but achievable and seeks your views. The Mayor, working with London Community Recycling Network, the London Waste and Recycling Board, waste authorities and Recycle for London will develop a programme of work to achieve an agreed target for municipal waste reuse for the lifetime of this strategy.

Consultation questions

Do you agree the Mayor can best influence waste reduction and increase awareness on the value of reuse and recycling in London by supporting local and regional waste campaigns? What else do you think the Mayor can do to make an effective impact?

Do you agree that a National approach to improving waste reduction and reuse is the best way forward? [Yes/no, why]

What measures might the Mayor most valuably lobby government for?

What do you think will be the main barriers to achieving targets set on reduction of household waste? How can they be overcome?

This target, when coupled with the increase in number of households, will deliver a zero per cent increase in London's net household waste. Do you consider this target to be too high, about right or too low and why?

What do you think are the main barriers to achieving targets for reuse and repair, and how can they be overcome?

Considering what you know already exists in the reuse sector in London, how do you think the sector could most effectively be developed and supported to improve reuse rates?

What do you think are the key elements for an effective programme of action with manufacturers and retailers to reduce packaging?

How can the Mayor best measure the direct impact of actions he supports to reduce waste, and increase recycling and reuse? What are the key factors that need to be taken into account?

Endnotes

1 Based on a provisional allocation as set out in the London Waste and Recycling Board 2009/10 Business Plan.
2 *Household food and drink waste in the UK*, WRAP, November 2009
3 *The London Housing Strategy*, Draft for public consultation, May 2009
4 Based on a provisional target set in WRAP's Love Food Hate Waste campaign, October 2009. Final Recycle for London targets and other key performance indicators will be set in early 2010.
5 Table 1: Populations trend (at mid-year), DMAG briefing 2005/17, Focus on London's Demography, 2005.
6 Table 1: Population by Country of Birth: United Kingdom and London: 2004 to 2007-08: thousands and percentages, GLA

Demography, Update, 2002-2009, February 2009.

7 London Remade, Waste reduction and re-use research in London, Greater London Authority and London Development Agency, March 2006.

8 Plastic bag CO_2 calculation based on WRAP figures: www.wrap.org.uk/retail/news_events/news/move_by_tesco_to.html (last accessed 26 November 2009).

9 "Third sector reuse capacity in London report", GLA 2007

10 The Love Food Hate Waste campaign is measured by consumer tracking. The survey asks around 20 questions and includes WRAP's three "metric" topics on attitudes and self-reported behaviour:
1) How much food do you think you throw away?
2) Does it bother you?
3) How much effort do you go to in order to minimise the amount of food you throw away?
The answers to these three questions are then combined, and people who answer 'hardly any' or 'none' to question 1, 'a great deal' to question 2 and 'a great deal' to question 3 are deemed to be Committed Food Waste Reducers.

Policy 2: Setting a greenhouse gas standard for municipal waste management activities to reduce their impact on climate change.

Vision

The management of London's municipal waste can and should deliver the greatest possible greenhouse gas[1] savings through waste reduction and increased levels of reuse, recycling, composting and efficient energy generation.

From vision to policy

The Mayor will set a minimum lifecycle greenhouse gas performance[2] standard for the management of London's municipal waste. In developing new municipal waste contracts, waste authorities will need to ensure waste management activities associated with the collection, transport, treatment, energy recovery, and final disposal of waste collectively meet this standard, or demonstrate that they have steps in place to meet it in the near future.

From policy to action - proposals

- The Mayor will work with waste authorities to implement the Mayor's waste hierarchy in the development of municipal waste contracts and in waste management activities, to achieve the greatest possible greenhouse gas savings.
- The Mayor will work with the Environment Agency, waste authorities, and the waste industry to develop a consistent and comparable modeling approach to measuring the lifecycle greenhouse gas performance for managing London's municipal waste. The Mayor will consult on this modeling approach with wider stakeholders during the public consultation of his municipal waste management strategy in mid 2010.
- The Mayor will set a lifecycle greenhouse gas performance standard for the management of London's municipal waste in agreement with the Environment Agency, waste authorities and in consultation with the waste industry. The Mayor will consult on this performance standard during the public consultation of the Mayor's municipal waste management strategy in mid 2010.
- The Mayor will work with waste authorities on independent research to update London's municipal waste composition data. This will ensure the most current and accurate data is used for setting a minimum lifecycle greenhouse gas performance standard.
- The Mayor will work with London's existing incineration operators to explore opportunities for using waste heat generated to improve the incinerators' overall efficiency and greenhouse gas performance.

What this will achieve

Selecting the optimal means of dealing with London's municipal waste currently sent to landfill through reuse, recycling and efficient energy generation could save two million[3] tonnes of carbon dioxide equivalent emissions (CO_2eq) each year. These savings can be achieved by avoiding emissions that would otherwise have occurred by sending waste to landfill, manufacturing from virgin materials, or generating energy using fossil fuels.

A lifecycle greenhouse gas performance standard for the management of London's municipal waste will:

- Reduce and avoid CO_2eq emissions from all London's municipal waste activities to achieve a positive carbon outcome.
- Help boroughs to act in general conformity with the Mayor's Municipal Waste Management Strategy when developing municipal waste services and contracts.
- Incentivise the takeup and rollout of emerging clean technologies
- Assist waste planning applications to be in general conformity with the London Plan.

Why we need change

A key driver for changing the way we deal with London's municipal waste is climate change. There is a massive opportunity for London to achieve significant greenhouse gas savings by diverting more waste away from landfill. This also reduces energy bills, creates economic value and increases energy security.

Carbon reductions can be achieved by firstly preventing or reducing the amount of waste produced, followed by reusing, recycling or composting waste, and generating energy from any waste remaining. London sends about 1.95 million tonnes of municipal waste to landfill each year, releasing approximately 520,000 tonnes of CO_2eq. By selecting the optimal means of dealing with waste instead of sending it to landfill, London could save about two million tonnes of carbon dioxide equivalent emission, resulting in a 1.5 million tonne net positive carbon outcome. This is because reusing, recycling or composting, or generating energy from waste not only saves emissions from landfill (direct emissions), it also avoids indirect emissions that would have otherwise occurred from manufacturing virgin materials or generating energy using fossil fuels (such as coal or gas).

Considering direct and indirect emissions is a widely used approach for determining the overall greenhouse gas performance of waste management. This approach relies on lifecycle assessment techniques to measure all emissions associated with the production of waste through to its final disposal. A lifecycle approach allows us to better understand how waste can positively contribute to climate change mitigation by focusing on the

management methods that achieve the greatest greenhouse gas savings as a whole.

Table two below shows the potential lifecycle greenhouse gas performance of different waste management methods for various waste materials. This can help identify the optimal treatment methods for each material.

For example, the optimal treatment method for food waste, after waste reduction, is anaerobic digestion. Each year London sends approximately 370,000 tonnes[4] of municipal food waste to landfill. By applying the lifecycle emission factor for landfill, given in Table Two, it can be seen that this waste releases approximately 135,000 tonnes of CO_2eq each year.

Using food waste to generate renewable energy instead, through anaerobic digestion, could save about 172,000 tonnes of CO_2eq a year. This figure represents the combined emissions saved from both landfill diversion (135,000 tonnes) and from energy that would otherwise have been generated (37,000 tonnes) using the current UK energy grid mix, of which around 80 per cent comes from coal and gas.

Table Two: Lifecycle greenhouse gas performance of waste materials by waste management method (expressed as CO_2eq emissions).[5]

	Kgs of CO_2eq produced (or avoided) per tonne of waste prevented or treated					
Waste Material	**Waste prevented or reduced**	**Recycling** (closed loop*)	**Anaerobic digestion** (generating electricity only)	**Composting**	**Incineration** (generating electricity only)	**Landfill**
Paper and card	-950	-713	-121	57	-500	550
Kitchen / food waste	-2,428		-100	30	-89	365
Garden / plant waste	-89		-100	57	-121	210
Wood	-256	250			-700	930
Textiles	-19,294	-3800			600	300
Plastic (dense)	-3,100	-1500			1,800	40
Plastic (film)	-2,500	-1000			1,800	35
Metals (ferrous)	-3,100	-1300			786	10
Metals (non-ferrous)	-11,000	-9000			23	10
Glass	-840	-315			5	10
Aggregate materials	-8	-4			35	10
Mixed waste**					70	300

Source: 2009 Guidelines to Defra/DECC GG Conversion Factors for Company Reporting, June 2009: www.defra.gov.uk/environment/business/reporting/pdf/20090928-guidelines-ghg-conversion-factors.pdf. (Last accessed 15 December 2009).
* Closed loop recycling refers to recycling materials back into their original form and use. For example recycling glass back into glass instead of recycling it into aggregate.
** Defra has not produced emission factors for treatment of mixed waste. A mixed waste emission factor has been taken from an indicative composition of London's municipal waste contained in Greenhouse gas balance of waste management scenarios, GLA January 2008, Table 7.4.

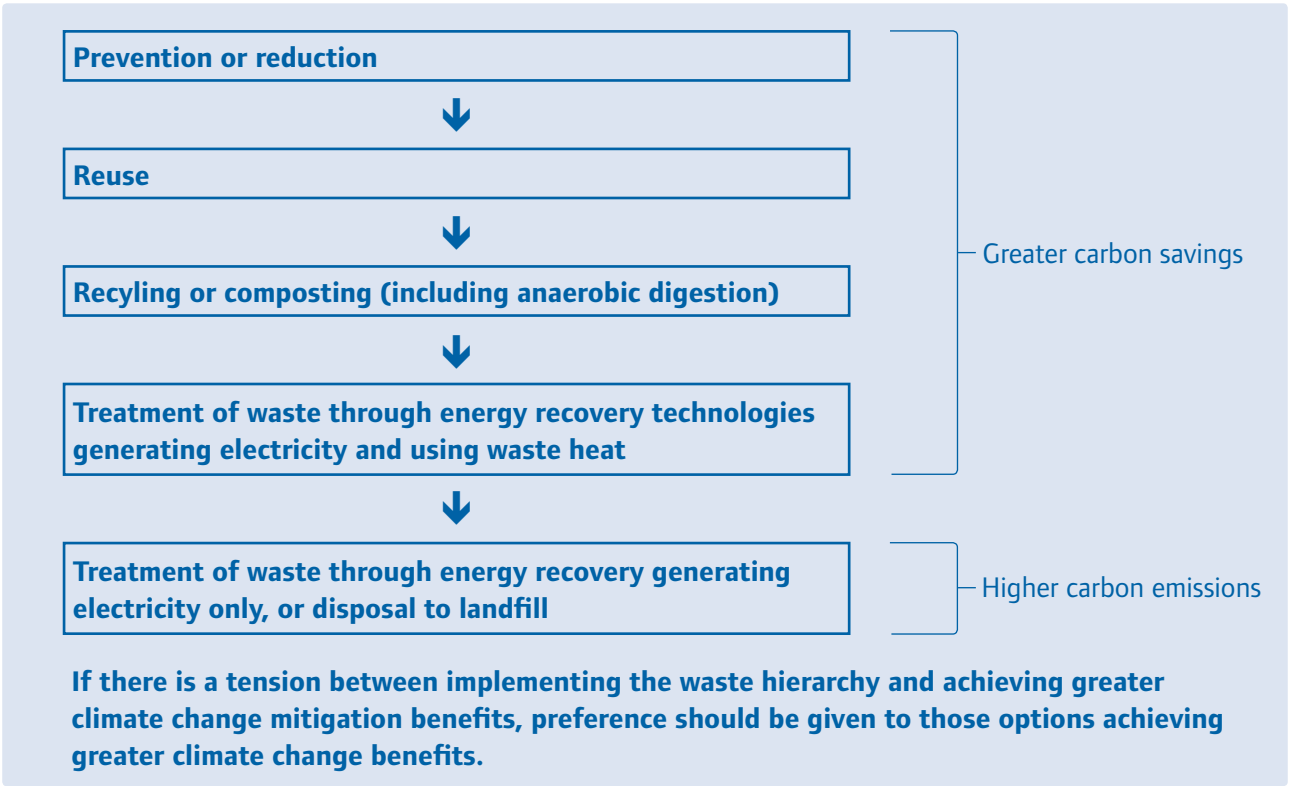
The figures in Table Two can give an indication of the emissions generated or avoided by each management method and are being reviewed by Defra. The true performance will depend on many factors, including the quality of the waste materials, the composition of mixed waste going for treatment, and the configuration and performance of waste facilities, and these need to be considered. The GLA will use revised emission factors in the development of the next draft of this strategy for public consultation in mid-2010. The revised figures will also include emissions for all energy recovery methods, including gasification and pyrolysis, generating electricity and using waste heat.

A robust study of the overall composition of municipal waste in London has never been done, although many local authorities undertake their own waste composition surveys. The Mayor believes up-to-date composition figures for London are needed as a matter of urgency, in order to understand and improve the lifecycle greenhouse gas performance of the capital's municipal waste.

Implementing the Mayor's waste management hierarchy

To achieve the greatest greenhouse gas savings, the Mayor's waste management hierarchy should be applied in sequence from the top down.

The Mayor's waste management hierarchy



Each stage provides the optimal method of management based on the composition of the waste stream at that point.

Reduction and reuse options should be considered first as they minimise the demand for new resources and energy, reducing the size, costs and environmental impact of waste treatment and disposal facilities. Preference should then be given to recycling or composting at source, which avoids emissions that would otherwise have been produced from manufacturing virgin materials. Any waste remaining (residual waste) should be treated to recover as much additional recyclable material as possible. This can be done using new and emerging technologies including autoclave, a steam sterilisation process that enables the different materials to be sorted more easily, and mechanical biological treatment (MBT), where a combination of mechanical and biological treatments separates certain elements of the waste.

Such technologies are important if the best climate change mitigation benefits are to be achieved for London. Research[6] undertaken for the GLA found that untreated mixed waste being used for energy recovery had the greatest climate change impact after landfill as a waste treatment method. Recycling offered a much better environmental outcome in terms of greenhouse gas savings. It also showed the importance of using pre-treatment technologies (such as autoclave and MBT).

Once these treatments have taken place, the waste hierarchy dictates that the non-recyclable waste left over should then be used to recover energy, using facilities where both heat and power are generated, to be used either on site, or exported off site, to achieve the greatest greenhouse gas savings. This should be done using a process that is eligible for renewable obligation certificates (ROCs). Heat makes up two-thirds of energy generated so capturing waste heat greatly improves the overall efficiency of energy recovery facilities.

Preference should also be given to those technologies with the greatest electrical efficiencies and fuel flexibility. According to the GLA's research, after reuse and recycling, the greatest greenhouse gas savings can be achieved by generating energy using advanced conversion technologies such as anaerobic digestion, gasification, and pyrolysis. Some of these technologies are still gaining acceptability in the market and not all are commercially available at large scale. However, increasingly greater take up of these kinds of new technologies is essential given that they can achieve higher efficiencies and lower greenhouse gas emissions than incineration. The gas fuels produced by advanced conversion technologies can be burnt to produce steam, used as a fuel for gas engines or used in hydrogen fuel cells to generate renewable energy. Incineration can only produce electricity through the production of steam at electrical efficiencies of around 25 per cent. Gas engines can produce electrical efficiencies in the region of 30 per cent or above, while fuel cells can be in excess of 50 per cent efficient.

Gas fuels from advanced conversion technologies can also be converted into transport fuel, such as biofuels or hydrogen fuel. Biofuels produce fewer greenhouse gas emissions than petrol or diesel, while hydrogen fuel produces no emissions at all. There are currently no advanced conversion facilities operating in London although there are numerous operating examples both in the UK and overseas. London has granted planning consent for its first commercial scale gasification facility and one major waste company has recently announced plans to develop six gasifiers in the UK. Furthermore the London Waste and Recycling Board is currently working with partners on roughly a dozen projects involving advanced conversion facilities for London.

Generally, by applying the waste hierarchy, the greatest greenhouse gas savings will be made. However, there are certain circumstances where the waste hierarchy conflicts with achieving the greatest climate change benefits. For example, depending on the condition of wood, it may be better to generate energy using wood waste rather than to recycle it. In these cases, it is proposed that boroughs should aim to take the approach that will deliver the greater climate change benefits.

What needs to be done

Achieving the best possible lifecycle greenhouse gas performance from London's municipal waste

The Mayor will work with waste authorities to implement his waste hierarchy to reduce the climate change impact of managing London's municipal waste. Ultimately, the Mayor wants the management of London's municipal waste to achieve a positive carbon outcome, particularly for waste that currently goes to landfill or mass-burn incineration. Rather than focussing on particular waste services or technologies, the Mayor will look at the outcomes of particular methods, based on their lifecycle greenhouse gas performance.

An outcome-based approach, using lifecycle greenhouse gas performance, will support waste activities and services that reduce the amount of waste produced, and capture the greatest number and highest quality of materials for reuse, recycling or composting. This approach will rule out new mass-burn incineration facilities. However this approach might support small-scale renewable energy recovery of biomass waste where both the heat and power generated are used. It will also drive increases in recycling and pre-treatment of waste. Focusing on outcomes should also encourage the adoption of whatever clean technologies are emerging.

To implement such an approach, the Mayor will work with waste authorities, the Environment Agency, and the waste industry to develop a common modelling approach to measure the lifecycle greenhouse gas performance of municipal waste management activities. A baseline lifecycle greenhouse gas performance of London's municipal waste will need to be set, and importantly, there will need to be agreement on what activities should be included in greenhouse gas accounting.

The GLA has been in discussions with the Environment Agency, London waste authorities and the waste industry to investigate using the

Environment Agency's Waste and Resources Assessment Tool for the Environment (WRATE) as a common modelling approach for London. WRATE, already used by a number of London's local waste authorities, uses a lifecycle assessment of resources used, waste transportation and operation of a whole range of waste management processes with their environmental costs and benefits. More information on WRATE can be found at www.environment-agency.gov.uk.

With a common modelling approach agreed, the GLA will then model a number of waste management activities for London's municipal waste. By looking at how a mix of technologies might be used in practice, based on London's waste projections, a projected lifecycle greenhouse gas performance for London to work towards will be calculated. This will provide the basis for the Mayor to set a lifecycle greenhouse gas performance standard for the management of London's municipal waste, in agreement with the Environment Agency, waste authorities and the waste industry. This standard will apply to all municipal waste management activities, including from the collection, transport, treatment and the disposal of waste.

New municipal waste contracts and waste planning applications will need to meet this standard[7]. Some boroughs already undertake greenhouse gas assessments of their waste activities as part of new waste contract procurement or waste service improvements. The Mayor wants a common modelling approach to complement these activities, and will work with boroughs and the government to achieve this, making sure there are links to the government's National Indicators 185 and 186[8].

Lifecycle greenhouse gas modelling will need to be aligned with financial modelling to ensure solutions are cost-effective, technologically robust and practically achievable in London.

Consideration will also need to be given to waste activities that mitigate negative impacts on human health, including local air quality. Nitrogen oxides (NO_x), which contribute to nitrogen dioxide (NO_2), and fine particulate matter (PM_{10}) represent two of the main emissions from waste management processes. These pollutants are of concern in London because of their potential effects on human health. For example, particulate matter aggravates respiratory and cardiovascular conditions and, at high levels, NO_2 causes inflammation of the airways, while long-term exposure can affect lung function and respiratory symptoms. The EU has set limit values aimed at significantly reducing the health impacts of poor air quality. The Mayor's draft Air Quality Strategy sets out how the Mayor will protect the health of Londoners and increase their quality of life by improving the quality of air they breathe. The Mayor expects proposals for new waste facilities within London to be sited on appropriate locations where impacts on local air quality are minimal. The Mayor also expects that all new waste management facilities will make use of best available emissions abatement technologies.

The Mayor aims to agree a common modeling approach for managing London's municipal

waste ahead of the public consultation stage of the Municipal Waste Management Strategy in mid-2010.

Although new, more efficient facilities offer the best potential for reducing the climate change impact of London's waste, there is also scope for improvement in London's existing waste facilities. For example, none of London's incinerators use the vast amounts of heat they produce although some ideas are being explored to install heat distribution networks from the South East London combined heat and power incinerator (SELCHP) in Lewisham to provide heat to neighbouring residential and commercial developments. Research[9] commissioned by the GLA showed incineration of untreated waste operating in combined heat and power mode is carbon neutral, in that it avoids as much carbon dioxide equivalent as it creates from energy generation. The Mayor will work with London's incineration facility operators to explore heat-use infrastructure opportunities to improve the incinerators' overall efficiency and thus their lifecycle greenhouse gas performance. More detail on the Mayor's proposals to work with London's incinerator operators is set out in Policy 5.

With the approach outlined above, the Mayor expects that not only will there be a reduction in greenhouse gas emissions as a direct result of changes in the way waste is managed, but waste will also play an important and active role in reducing emissions from London's energy, currently dominated by fossil fuels, by providing renewable energy. In particular, London's municipal food, green garden and wood waste can be used to provide decentralised renewable energy, helping the Mayor to achieve the target of a 60 per cent reduction in London's CO_2 emissions (on 1990 levels) by 2025, as set out in The London Plan (consultation draft replacement plan, October 2009).

With up-to-date information on municipal waste composition data being collected ahead of the public consultation stage of the Mayor's draft municipal waste management strategy, the GLA will model the potential contribution waste could make towards achieving the Mayor's CO_2 emission reduction target for London.

Consultation questions

Do you agree with the Mayor's proposed approach for the management of London's municipal waste based on lifecycle greenhouse gas performance? Which waste management activities do you think should or should not be included in a common modelling approach to lifecycle greenhouse gas accounting for waste?

What do you see as the key barriers to implementing a lifecycle greenhouse gas performance standard? What are the key steps that need to be taken to ensure its success?

Do you agree that focussing on lifecycle greenhouse performance is more effective than focussing on specific waste services or technologies? What level of standard can or should be adopted?

Do you support the adoption of WRATE as a common modelling approach?
Are there any limitations or strengths of

adopting this approach? Alternatives and further suggestions?

Given these considerations, are there any waste solutions that you consider inappropriate for London?

Do you agree that the Mayor's waste management hierarchy is the approach? Are there are any other considerations that should be included?

Do you agree that the Mayor should be supporting the development of advanced conversion technologies in London? What do you see as the main challenges in achieving this?

What do you see as the key issues in retrofitting incinerators and improving their efficiency and greenhouse gas performance? Are you aware of any instances when this has been undertaken that we might learn from as best practice?

Endnotes

1 Includes the six main greenhouse gases carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons (HFCs), and perfluorocarbons (PFCS). Methane and carbon dioxide make up about 98 per cent of greenhouse gas emissions from waste activities.

2 Life cycle assessment techniques measure the environmental and economic costs and benefits of products and activities (in this case waste) at every stage of its existence, from production to final disposal. The environmental costs and benefits in this case would be expressed in greenhouse gas emissions.

3 Based on optimal treatment of the most commonly recovered waste materials being glass, metals, paper and card, mixed plastics, textiles, food waste, and green garden waste. These materials make up approximately 90 per cent of London's municipal waste stream.

4 Based on kitchen food making up 19 per cent of household waste. Government's Waste Strategy 2007 uses a 17 per cent figure from a study undertaken in 2001. 2008/09 Wastedata flow returns indicate a slightly higher proportion of food waste being in the residual waste stream, and therefore a higher proportion figure has been applied here. It is assumed household waste is similar in composition to municipal waste; London waste to landfill figures taken from Defra Waste Statistics, 2009, refer: www.defra.gov.uk/evidence/statistics/environment/wastats (Last accessed 15 December 2009).

5 Negative emission factors represent greenhouse gases avoided that would have otherwise occurred from manufacturing virgin materials, sending waste to landfill, and/or generating energy using current UK energy grid mix. The UK grid mix, with 80 per cent coming from fossil fuels, has a greater "carbon intensity" than, for example, food waste and wood, deemed to be "carbon neutral".

6 *Greenhouse gas balance of waste management scenarios*, GLA, February 2008.

7 Waste planning applications will be dealt with through London Plan policies.

8 National Indicator 185: CO_2 reduction from local authority operations; National Indicator 186: Per capita reduction in CO_2 emissions in

the local authority area.

9 Greenhouse gas balance of waste management scenarios, GLA, February 2008.

Policy 3: Capture the economic benefits of municipal waste management

Vision

The approach to managing London's municipal waste changes from 'a problem to be disposed of' to 'an opportunity to be exploited'.

From vision to policy

The Mayor will work with waste authorities and third sector organisations to ensure that London is taking steps to maximise the economic benefits to London from its waste managment.

From policy to action – proposals

The Mayor will:

- Work with London waste authorities on a best practice review of revenue-sharing opportunities in municipal waste management contracts.
- Work with London Councils and Capital Ambition to investigate the opportunities for developing model municipal waste contracts that incorporate best practice and achieve tangible efficiency savings for waste authorities to use.
- Working with the boroughs, investigate the economics of co-mingled collection of recyclable waste (collecting all recyclables together) and kerbside sort (separating recyclable materials as they are collected), and a blend of the two, to determine the most cost-effective services, taking into account local considerations.
- Seek to provide investment, through the London Waste and Recycling Board, to help waste authorities and the private sector establish waste management facilities that achieve the greatest reductions in greenhouse gas emissions including through for reuse, upcycling[1] and closed loop recycling.
- Work with the London Waste and Recycling Board to help waste authorities that are interested in building and operating their own waste facilities to develop those facilities, particularly where they are able to work in partnership with other waste authorities.
- Work with waste authorities to tackle barriers that make it hard for the third sector to deliver local authority reuse and recycling services.
- Undertake more research into the costs of managing London's municipal waste through different mechanisms.

What this will achieve

In order for municipal waste to become a greater source of economic benefit to London, one consideration is that the quality of the recyclable material needs to be of a high standard. Managing London's municipal waste as a resource will improve its quality, making it a commodity that is desirable to the re-manufacturing sector.

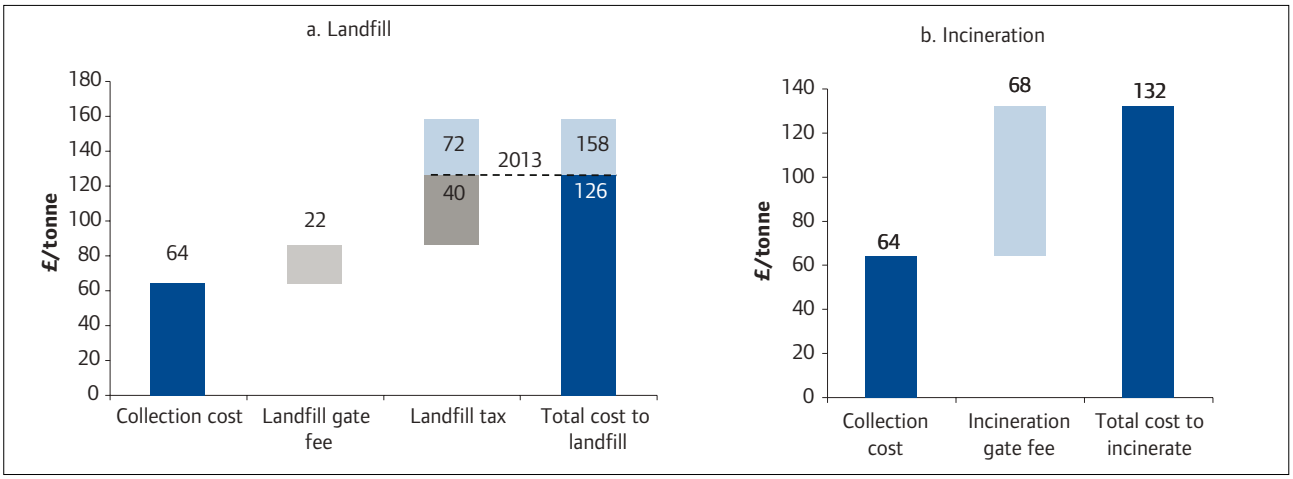
Once municipal waste is established as a commodity, its management as a resource will be market led, and as a market-led resource, it will have a value, albeit a fluctuating one.

Establishing a market for materials and energy that have come from municipal waste, and giving them a value to businesses in this sector, could save London up to £70 million by avoiding gate fee costs.

Preparing London to manage its municipal waste in the most carbon efficient and economically beneficial could generate approximately 350 green-collared jobs and £13m of direct Gross Value Added (GVA) each year to 2025.

London's municipal waste, after maximising recycling could contribute £80 million of savings to London's £4 billion electricity bill and £24 million off London's £2.6 billion gas bill.

Figure 7: Collection costs and landfill and incineration gate fees.



Note: Landfill tax at £40 per tonne in 2009, rising £8 / tonne per year to £72 by 2013
Source: Gate Fees Report, WRAP, 2009; London Borough Survey, GLA, Spring 2009-Typical collection costs based on interviews with waste authorities. Individual waste authority costs will vary.

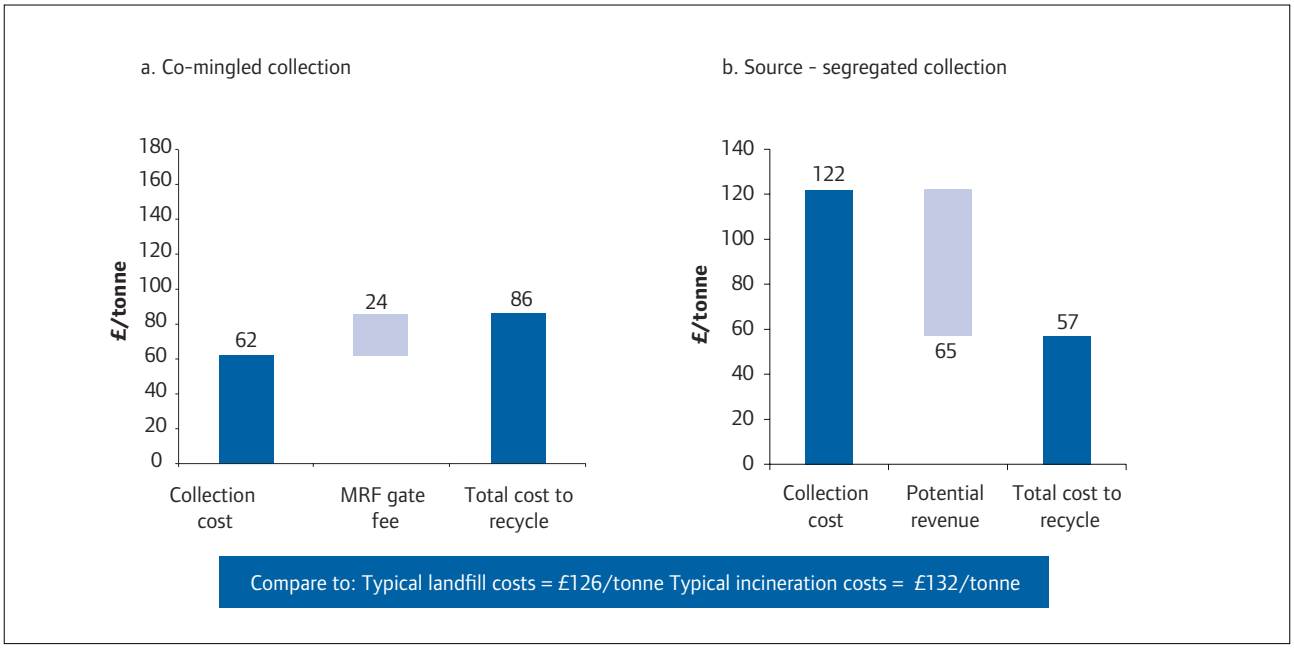
Why we need change

Waste authorities must pay fees to have waste collected (collection costs). They must then pay for waste that is not reused, recycled or composted to be accepted at landfill sites or incinerators (landfill and incineration gate fees). A tax is also applied to waste disposed to landfill. These costs are shown in Figure 7.

Today landfill tax is £40 per tonne. Landfill taxes are set to rise by £8 per tonne until 2013 when it will be £72 per tonne. As landfill will become increasingly expensive, even if all other costs (such as collection and gate fees) remain the same, landfill will be the most expensive option for waste by 2011.

As with landfill and incineration, most waste authorities also incur collection costs and gate fees with the processing of recyclable materials. These costs will be lower for the small number of waste authorities that have a share in waste treatment facilities or have revenue-share entitlements worked into their contracts. Typical recycling collection and gate fee costs and potential revenue are shown in Figure 8.

Figure 8: Typical costs to recycle waste



Source: Kerbside Recycling: Indicative costs and performance, WRAP, 2008; Gate Fees Report, WRAP, 2009; GLA, 2009
Notes: Typical costs based on median values from WRAP. Individual waste authority costs will vary. Figure (b) does not include sorting or bulking costs. Potential revenue is calculated using WRAP's recycled material prices and average waste composition analysis from Defra. Mean revenue for source segregated recycling is based on: (1) The average composition and weight of materials (paper, glass, plastics, cans) in household waste arisings, refer: Waste Strategy for England 2007. (2) The average price for materials (paper, glass, plastics, cans), refer: Kerbside Recycling: Indicative costs and performance, WRAP, 2008

Recycling collection costs have traditionally been higher than residual waste collection costs because:

- Volumes of recyclable materials per household have been lower than volumes of residual waste, so collection vehicles have to travel further to reach capacity
- Collecting recyclable materials can require separate vehicles or multiple compartments within one vehicle to collect different materials
- Compaction vehicles collecting recyclables compact less than those collecting residual waste and therefore carry less material per trip.

Some of this cost will reduce as volumes of waste collected for recycling increase.

In most cases waste authorities do not own or have any share in waste sorting or reprocessing infrastructure, nor do they receive any revenue from recycled materials. Currently recycling does not typically generate profit for most waste authorities. However, the savings made by diverting materials from landfill (and avoiding the landfill gate fees) compensate for the extra cost of collection. Increases in landfill tax until at least 2013 will strengthen the economic case for recycling over landfill.

Revenue-sharing opportunities

An economic opportunity for waste authorities is in getting hold of some or all of the potential revenue from recyclable material. Figure 8 (b) highlights potential revenue from recyclable waste of up to £65 per tonne for material collected separately at the kerbside, excluding any sorting or bulking costs (the costs of gathering material together). The precise level of revenue available to a waste authority will depend on whether they own and operate the sorting and bulking facilities or procure the services from a third party.

Organic waste collections

Based on initial analysis with some waste authorities, the cost of separately collecting and treating organic waste (food and green garden waste) is similar to collecting residual waste and sending it to landfill, which stands at about £126 per tonne. Separate collections of organic waste, particularly food waste, which is particularly well suited to renewable energy generation using anaerobic digestion, will become more commercially attractive as landfill taxes increase. At the same time, energy generation will bring additional income through renewable obligation certificates (ROCs[2]), a government incentive to encourage the generation of power from renewable sources.

By investing in and establishing collection systems for organic food waste now, London waste authorities will be able to save on the cost of collecting waste in the future.

What needs to be done

The Mayor believes that London is missing a huge proportion of the economic opportunity that municipal waste presents to the city. It is estimated that London's municipal waste management bill per year is nearly £600 million[3]. Yet the data above suggests that there are both significant savings to be made - in the region of £90 million[4] per year by 2013 - and further potential income opportunities.

This figure is likely to be a conservative estimate as it is based on collection costs, gate fees and disposal costs for London's municipal waste only. In order to fully understand the potential economic opportunity for London, the Mayor proposes to undertake further research into the costs of managing London's municipal waste.

Waste authorities sharing the benefits

In addition to consistently pursuing cost savings, waste authorities should also consider the opportunities to realise the full value of waste material through revenue-sharing, joint venture or similar arrangements.

To date, the main focus of London's waste authorities has been to manage municipal waste as efficiently as possible and at minimal cost to the taxpayer. Traditionally this has been by adopting low-cost collection methods and outsourcing the treatment and disposal (usually sending it to landfill). One consequence of this 'least cost' approach is that sometimes waste authorities have not actively pursued the opportunity to generate income from their waste management activities.

But this approach will not be the most cost-effective approach for much longer. The cost of waste management in London has increased in recent years and will continue to rise for the foreseeable future, as changes in European and central government legislation are pushing up the cost of landfill. The decline of landfill space is exacerbating the problem.

Many waste authorities have not yet capitalised on the growing market for recycled materials, or on the demand for the energy that can be produced from waste because of this approach. Part of the problem lies in the fact that they have tended to enter in to long-term inflexible contracts, where the emphasis has been on a stable, least-cost pricing structure. These contracts have rarely been linked to the revenue generated by private contractors from selling on materials and generating energy from waste, partly due to legislation and partly due to a preference to outsource risk.

The Mayor proposes to work with London Councils, Capital Ambition and London's waste authorities to identify good examples of revenue-sharing and joint venture arrangements that achieve tangible efficiency savings, with the aim of developing a suite of model approaches and contracts.

The Mayor will also further investigate the economics of different collection methods to help waste authorities compare services and determine the most practicable, cost-effective and carbon-saving methods.

The Mayor supports those waste authorities already working together to develop cross-boundary contracts and service agreements and wants to work with other waste authorities to explore joint contract opportunities.

Until 2005, waste authorities were prevented from operating their own facilities by legislation. The Clean Neighbourhoods and Environment Act 2005 has amended the Environmental Protection Act 1999, allowing waste authorities, or consortia of authorities to design, build and

operate their own facilities. The Mayor wants to encourage and support any waste authorities that are prepared to consider owning and operating treatment facilities for municipal waste, such as Materials Reclamation Facilities (MRFs) and anaerobic digestion plants, as this would help them retain the revenue from the sale of recyclables and energy, and offset collection costs.

The Mayor will work with the London Waste and Recycling Board and waste authorities interested in building and operating their own facilities, ideally in partnership with other waste authorities.

To evaluate thoroughly the economic opportunity of waste in London, a comprehensive data collection and modeling exercise is now required.

In developing an evidence base to further inform the waste strategy's policies and proposals for public consultation, the Mayor will commission a comprehensive and detailed collection of municipal waste data to include waste composition, as well as further financial information on waste collection, treatment and disposal.

Communities sharing the benefits

Voluntary and community groups have in the past been the pioneers of reuse and recycling but often can't compete for local authority contracts once the major industry players develop the same programmes. Yet these third sector groups offer substantial value through their work on reuse and recycling both in the form of local employment and training, as well as in the local distribution of items to people in need of support.

The Mayor values the contribution the third sector makes to waste management in London and will work with the London Waste and Recycling Board, London waste authorities and the London Community Recycling Network to increase the third sector's involvement in London waste and resource management. The Mayor will work with waste authorities to tackle barriers that make it hard for these groups to deliver local authority reuse and recycling services.

Delivering decentralised energy for Londoners

The Mayor has set a target for London to reduce its CO_2 emissions by 60 per cent by 2025. To achieve this, London must move as far as possible away from reliance on the national grid and on to local, lower-carbon energy supplies. These decentralised energy systems cover a wide range of technologies including high efficiency combined heat and power (CHP), district energy, heat pumps, solar thermal and photovoltaic energy and energy from waste.

The Mayor's goal is to enable a quarter of London's energy supply to be moved off the grid and on to local, decentralised systems by 2025. Moving to such systems could help achieve annual carbon savings of 3.5 million tonnes through more energy efficient generation, as well as enhancing London's security of energy supply and providing affordable heat and power to consumers.

The role of London's waste for decentralised energy

For waste that cannot be reduced, reused or recycled, the Mayor believes that energy should be recovered from that material in a manner that maximises the efficiency of that energy recovery and minimises the lifecycle CO_2. Waste lends itself well to decentralised energy systems due to the potential flexibility of the fuel that can be produced from it. Waste-derived gases from technologies such as anaerobic digestion and gasification, once cleaned, can be piped to local energy centres and used directly in gas engines, producing electricity and heat where it is required.

Using more of London's waste that cannot be recycled or composted to generate heat and power locally will be critical in achieving London's decentralised energy goal. If all municipal waste, after maximising recycling, were used for decentralised energy generation, it could generate enough energy to power up to 258,000 homes and heat up to 75,000 homes[5]. This could contribute £80 million[6] of savings to London's £4 billion electricity bill and £24 million off London's £2.6 billion gas bill.

Particular opportunities exist for London's municipal kitchen food waste. Each year around 370,000 tonnes of municipal kitchen food waste is sent to landfill. This waste, which produces the greenhouse gas methane as it decomposes in landfill sites, could instead be used to generate renewable carbon neutral energy using anaerobic digestion, potentially providing enough electricity for about 14,000 homes and heat for 6,000 homes[5].

Employment opportunities

The development of the green industries sector will lead to new training and employment opportunities for Londoners and further contribute to London's sustainable economic growth. London's environmental sector covers a diverse range of activities undertaken by the public, private and voluntary sectors employing around 140,000 people[7]. Although there is no employment data on specific elements of the environmental sector, the waste industry is a major employer of people across the social spectrum. Creating employment and training opportunities through sustainable resource management is a benefit to London's economy, people and environment.

It is estimated that in preparing London to manage its municipal waste in the most carbon-efficient and economically beneficial way that the number of new jobs, ranging from research and development, project management and manufacturing through to maintenance and operation of the facilities needed, will be in the region of 350 each year to 2025, according to a report produced by Ernst and Young for the London Development Agency[8]. The report also suggested optimising the treatment of London's municipal waste could represent an estimated £13m per annum of direct GVA. The Mayor supports the development of green industries and is keen to see that London benefits as much as possible from the green economy and jobs.

Consultation questions

Do you think the Mayor's vision for London's waste to be considered 'an opportunity to be exploited' is the right vision? Is it an achievable vision? What are the risks?

Do you agree that waste authorities should consider revenue-sharing opportunities with waste management contractors in order to realise some of the monetary value waste can offer?

What kind of issues do you think waste authorities might encounter in trying to do this? How can the Mayor support them best in pursuing this approach and overcoming problems?

Do you know of any good examples of revenue sharing and joint venture arrangements?

Do you think waste authorities should consider owning and operating their own waste facilities?

What support do you think the Mayor could most usefully give to help develop this opportunity for waste authorities? What are the risks for the parties involved?

What are the key considerations to ensuring success for waste authorities owning and operating treatment facilities?

What do you think are the key areas of waste management that the third sector should be involved in?

What do you see as the key barriers the third sector faces in delivering local authorities reuse and recycling services?

How do you think the Mayor can best help overcome these barriers?

Endnotes

1 Upcycling – turning waste into materials or products of equal or greater quality

2 The Renewables Obligation (RO) is designed to incentivise the generation of electricity from eligible renewable sources in the UK. The RO places an obligation on licensed electricity to source an increasing proportion of electricity from renewable sources. Suppliers meet their obligations by presenting Renewables Obligation Certificates (ROCs). Where suppliers do not have sufficient ROCs to cover their obligation, a payment is made into the buy-out fund. The buy-out price suppliers pay is a fixed price per MWh shortfall. The proceeds of the buy-out fund are paid back to suppliers in proportion to how many ROCs they have presented.

3 Based on average gate fees and collection costs, and 2008/09 waste flows.

4 This includes higher collection costs for recyclables that the GLA expects to reduce over time as recycling tonnages increase resulting in per tonne overheads reducing. £89m saving based on the following assumptions;
- income from textiles only (£100 per tonne, letsrecycle.com, March 2008).
- MRF gate fees from WRAP, 2009, for: paper, card, plastics and metals.
- Zero gate fee for sending wood waste to a biomass boiler.

- landfill tax set at 2013/14 rate of £72/tonne.

5 Based on the average home using 4,000kWh of electricity per year and 16,000kWh of gas for heat. Assumes organic waste is sent to anaerobic digestion, mixed waste to gasification, and wood waste going for incineration (biomass boilers).

6 Potential energy contribution based on: (1) Organics includes the following subsidies (1) ROC subsidy of £90 / MWH @ 0.151 MWh/t = £13.59/tonne. Refer: www.enviros.com/PDF/BN020RenewablesObligation.pdf (2) Wholesale electricity price of 8p/KwH @0.151 MWh/t = £12.08/tonne. Refer UK Energy Statistics, 2008. (3) Wholesale gas (=heat) price of 2p/kWh @ 0.259 MWh/t = £5.18/tonne. Refer UK Energy Statistics, 2008

7 Green Alchemy: Towards more from less: Helping London's small firms adapt, London Development Agency, January 2004.

8 Prospectus for London, the Low Carbon Capital, Ernst & Young, March 2009. Note: The report estimates potential employment and GVA figures for managing all of London's waste in the most carbon friendly and economically beneficial way. This includes commercial and industrial waste, and construction, demolition and excavation waste, representing three quarters of London's waste. A quarter fraction of these figures has been used to provide an estimate for the contribution municipal waste can make.

Policy 4: London to achieve 45 per cent municipal waste recycling or composting performance (including anaerobic digestion[1]) by 2015, 50 per cent by 2020 and 60 per cent by 2031.

Vision

Recycling or composting in London will be a hassle-free part of Londoners' lives, to achieve high rates of municipal waste recycling and composting.

From vision to policy

The Mayor will work with London's waste authorities, the London Waste and Recycling Board and the private sector to provide municipal waste recycling and composting collection services that are accessible and as consistent as possible across London, and incentivise households and businesses to utilise these services.

From policy to action - proposals

- The Mayor will undertake research, with waste authorities, on municipal waste recycling and composting performance across London with the aim of showcasing good practice and identifying opportunities to deliver high quality and cost-effective collection services and achieve high rates of recycling or composting.
- The Mayor will work with boroughs and the London Waste and Recycling Board to help boroughs provide recycling and composting collection services to small businesses comparable to those services provided to households.
- The Mayor will explore the potential with the London Waste and Recycling Board to fund infrastructure measures to encourage increase in recycling rates from flats, particularly in social housing.
- The Mayor will work with waste authorities to increase Londoners' use of local Reuse and Recycling Centres.
- The Mayor will work with waste authorities to provide positive incentives for Londoners to recycle and compost.
- The Mayor will work with waste authorities, the GLA group functional bodies, and the private sector to provide "on-the-go" recycling bins across London.
- The Mayor will work with waste authorities, using local media and marketing, to link local recycling and composting campaigns with regional initiatives through Recycle for London.

What this will achieve

Recycling or composting 60 per cent of London's municipal waste could save about 1.9 million tonnes of CO_2eq emissions[2] and £63 million in waste collection and landfill disposal costs each year[3].

The provision and promotion of accessible, consistent and cost-effective recycling and composting collection services across London, that incentivise Londoners to use them, will help meet the Mayor's municipal recycling and composting targets. Furthermore, it will be essential if we are to avoid high landfill costs going forward.

Achieving high recycling rates will ensure London's waste authorities achieve their Landfill Allowance Trading Scheme (LATS) allowances, as set by the government.

Why we need change

Twenty-five per cent of London's municipal waste in 2008/09 was recycled or composted, even though nearly 70 per cent of what we throw away could be.

Almost half of the waste produced (49 per cent or 1.95 million tonnes) was sent to landfill, mostly to sites outside London. Sending municipal waste to landfill cost London boroughs – and ultimately London's taxpayers – approximately £245 million[4] in 2008/09. At current performance (assuming no increase in collection costs and gate fees and no change in waste levels), this will increase to approximately £307 million in 2013 with the escalation in landfill tax to £72 per tonne. This represents a 26 per cent increase.

Another 23 per cent of London's municipal waste went to incineration, much of which could have been recycled or composted. London needs to significantly boost its municipal waste recycling and composting and create additional waste processing capacity, if it is to reduce its reliance on landfill and incineration, minimise disposal costs and reduce the environmental impact of its waste habits.

The Landfill Allowance Trading Scheme challenge

In April 2005, the Landfill Allowance Trading Scheme (LATS) was introduced to help waste disposal authorities reduce the amount of biodegradable municipal waste (BMW) sent to landfill. For the purposes of implementing LATS, it is assumed that 68 per cent of waste sent to landfill is biodegradable.

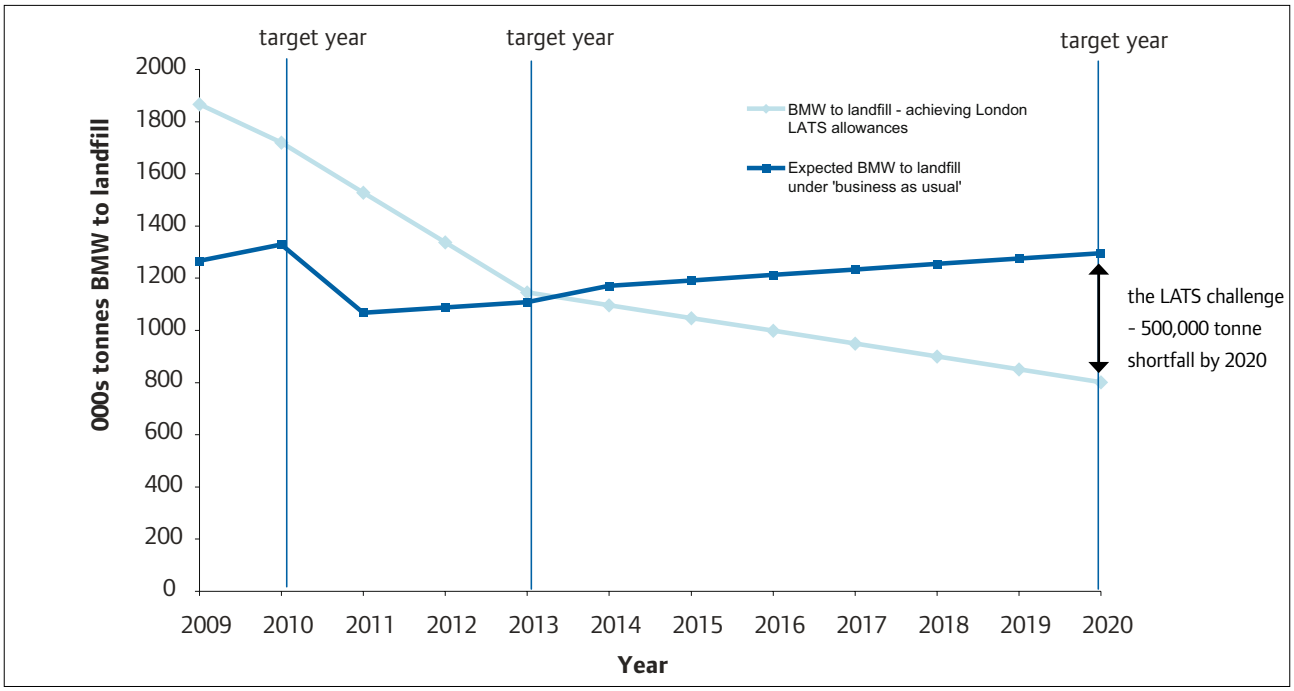
Figure 9 shows London's projected performance on LATS to 2020 based on current BMW to landfill rates. The modelling used to inform the projected performance assumes the Belvedere incinerator, opening in 2011, will treat approximately 450,000 tonnes of municipal waste each year, of which 68 per cent is estimated to be biodegradable. This explains a sharp drop in BMW to landfill in 2010/11, followed by a steady increase until 2020 with no new waste infrastructure assumed

thereafter. The GLA is aware of new municipal waste infrastructure being procured by London's waste authorities that will assist meeting LATS allowances. More information on new municipal waste infrastructure can be found in Appendix Two. The modelling assumes a one per cent annual growth rate in waste arisings to 2020.

Figure 9 shows London's waste authorities (waste disposal and unitary authorities) need to reduce the amount of BMW sent to landfill from approximately 1.9 million tonnes in 2009 to about 800,000 tonnes by 2020. Based on current performance and assuming a one per cent annual growth rate in waste arisings, it is estimated that collectively London's waste authorities will need to divert an additional 1.1 million tonnes of BMW from landfill between 2010 and 2020 in order to meet that allowance. London's waste authorities are collectively expected to meet their LATS allowances in the 2012/2013 target year.

This presents a significant challenge for London that needs to be met by reducing the amount of biodegradable municipal waste produced and increasing recycling and composting rates. Recycling, composting or sending this waste to anaerobic digestion would equate to an increase in London's municipal recycling performance from 25 per cent in 2008/09 to about 36 per cent in 2020[5].

Figure 9: London's performance on LATS based on current performance projected to 2020



Source: Local Authority LATS Allocations; Defra 2008: www.defra.gov.uk/environment/waste/localauth/lats/allocation.htm (Last accessed 15 December 2009); GLA modelling 2009 -2020.

At £150 for every tonne over the allowance, making no improvement on current performance could cost London waste authorities nearly £75 million in penalty fines alone by 2020.

The government is changing the approach for calculating the EU Landfill Directive targets to reduce the amount of BMW sent to landfill. The new approach will include much more commercial waste than currently and will bring the UK approach into line with the general approach adopted by other Member States. Changing the way municipal waste is assessed will mean amending the baseline on which the landfill diversion targets were set, and thus the 2010/2013/2020 targets for the UK. The government plans to consult on any subsequent changes this will have on LATS in early 2010.

London borough household recycling and composting performance

Household waste makes up 79 per cent of municipal waste (about 3.1m tonnes), and includes waste collected from reuse and recycling centres and street litter. London's household recycling and composting performance has improved threefold since 2000/01, from nine per cent to 29 per cent in 2008/09. Despite this considerable improvement, London is the lowest performing region in the UK, well below the UK household average of 38 per cent[6].

There is considerable variation in household recycling and composting rates across London's 33 boroughs (including unitary authorities and waste collection authorities), ranging from 15 per cent to just over 50 per cent, in 2008/09. Figure 10 shows the variation by borough. Thirteen boroughs achieved recycling or composting rates over 30 per cent with four of these achieving over 40 per cent and one achieving over 50 per cent. Two boroughs achieved less than 20 per cent. The average household recycling or composting performance in 2008/09 was 29 per cent.

All 33 London boroughs offer at least a basic household kerbside[7] dry recycling collection service although there is large disparity between the boroughs on which materials are collected and the methods of collection. London's household recycling and composting services are summarised below[8]. A full list of household recycling and composting services provided by London boroughs can be found in Appendix Four. There is a wide variation in services provided, e.g.:

- All boroughs provide kerbside collection services for paper, mixed cans, and plastic bottles. All except two boroughs collect glass at the kerbside and all except one collect cardboard.
- 19 boroughs provide a kerbside co-mingled (mixed) recycling collection service. 11 boroughs provide a kerbside sort service, and three boroughs provide a mix of the two collection services.
- 16 boroughs collect dry recyclables in a box. Nine boroughs use a sack, and eight use a combination of boxes, sacks and wheelie bins. The colour of recycling containers varies across boroughs.
- 26 boroughs provide a weekly recycling collection service. Five boroughs provide a fortnightly recycling collection service. Two

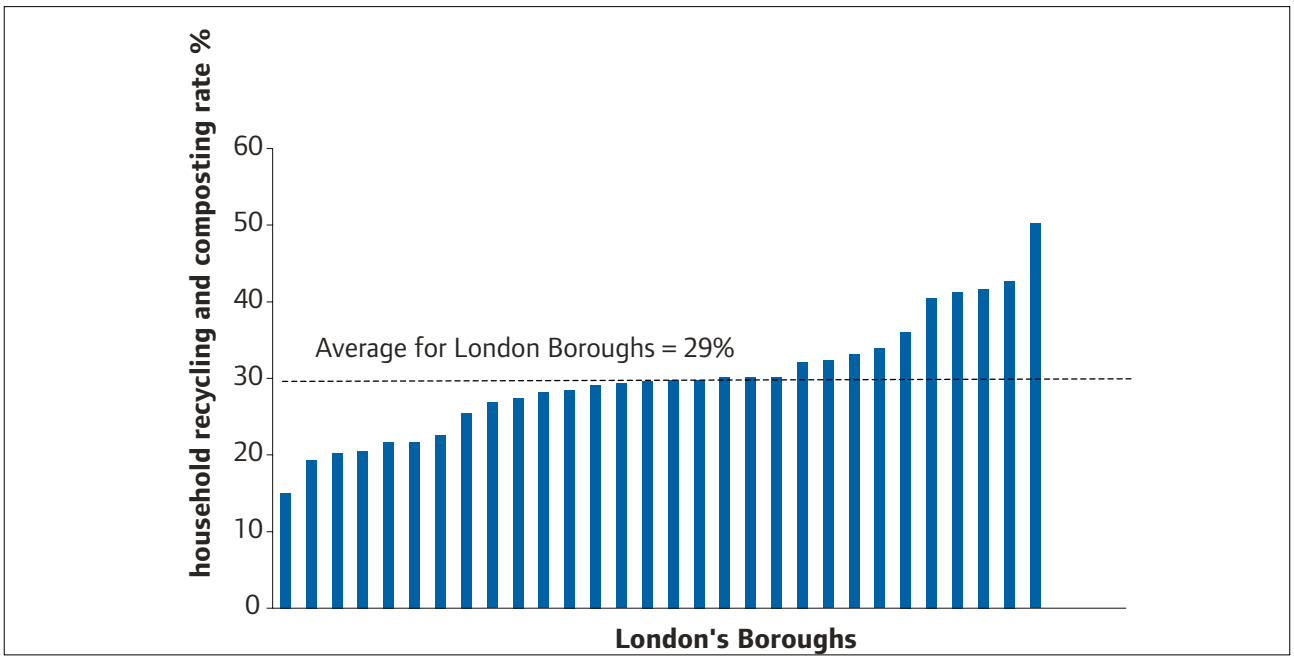
boroughs provide daily recycling collection services.

- All boroughs provide near entry (close to block or estate entrances) or 'bring banks' for flats and estates, although there is great variation between boroughs on what materials are accepted.
- All except one borough provides a green garden waste collection service. Ten boroughs provide separate weekly kerbside collections for food waste, and seven boroughs collect food and green garden waste together. Some boroughs provide food and green garden waste collections for flats and estates.

Variation and inconsistency in household recycling and composting collection services across London can cause confusion for residents, particularly when moving to other boroughs. One of the key complaints Londoners regularly cite when asked about London's environment is the confusing nature of recycling services. Furthermore very few boroughs offer any kind of financial incentives to increase participation in household recycling or composting services. In most cases, it costs residents the same to recycle their waste as it does to put waste in their black bag for landfill or incineration.

Depite extensive efforts, few boroughs have successfully tackled recycling and composting service provision to flats and other households that are not easily accessed from the street. Many boroughs continue to undertake trials on

Figure 10: London's household recycling and composting performance by borough 2008/09



Source: Defra waste statistics, 2008/09, refer: www.defra.gov.uk/evidence/statistics/environment/wastats (Last accessed 9 December 2009).

recycling or composting for flats and estates, but some schemes have been withdrawn due to being too expensive, too difficult, and having low levels of participation.

Indicative survey work with London boroughs showed average recycling or composting rates in flats and estates to be around ten per cent or less. Common barriers to achieving high recycling or composting in flats and estates include the lack of space for recycling storage and the difficulty of transporting materials to a collection point, often located externally to flats or estates. Targeting flats presents a huge opportunity for increasing London's recycling and composting performance given that half of London's households are flats[9].

Reuse and recycling centres

There are 41 Reuse and Recycling Centres (RRCs) in London, providing drop-off facilities for a range of household waste materials for reuse, recycling and disposal. They serve a wide community, from the inner city to the semi rural fringes of London, and are often the most familiar 'face' of recycling for many Londoners. These sites are strategically important waste management facilities, managing approximately half a million tonnes of waste per year. The locations of London's RRCs are shown in Figure 11 below showing a good geographic spread of centres.

RRCs play an important role in achieving high local recycling and composting rates. A report[10] commissioned by the GLA on best practice design of RRCs showed the average recycling and composting rate[11] of London's RRCs improved from 19 per cent in 2001/02 to 40 per cent in 2006/07. Some RRCs today achieve as high as 72 per cent. The report concluded there is great scope for further improvement and that 60 per cent recycling or composting levels are achievable in the short term through good design measures, with minimal costs. Given the strategic importance of these sites and greater potential, it is important that the current network of RRCs is safeguarded. The Mayor's draft London Plan states that existing RRCs should be protected and their use maximised.

On-the-go recycling

A number of boroughs provide recycling bins on streets in strategic locations, such as outside bus stops and train stations and in town centres, so that Londoners can "recycle on the go" during their daily commute. Recycling bins are most commonly available for paper, although some boroughs provide on-the-go recycling bins for plastic bottles, glass, and cans. However, overall in London there is still a tremendous missed opportunity to recycle waste generated on-the-go. The Mayor is therefore keen to promote on-the-go recycling across London. Research[12] undertaken for the London Assembly showed more than 260 tonnes of waste is produced at lunchtime in London every day, illustrating the need to capture the proportion of that waste that can be recycled.

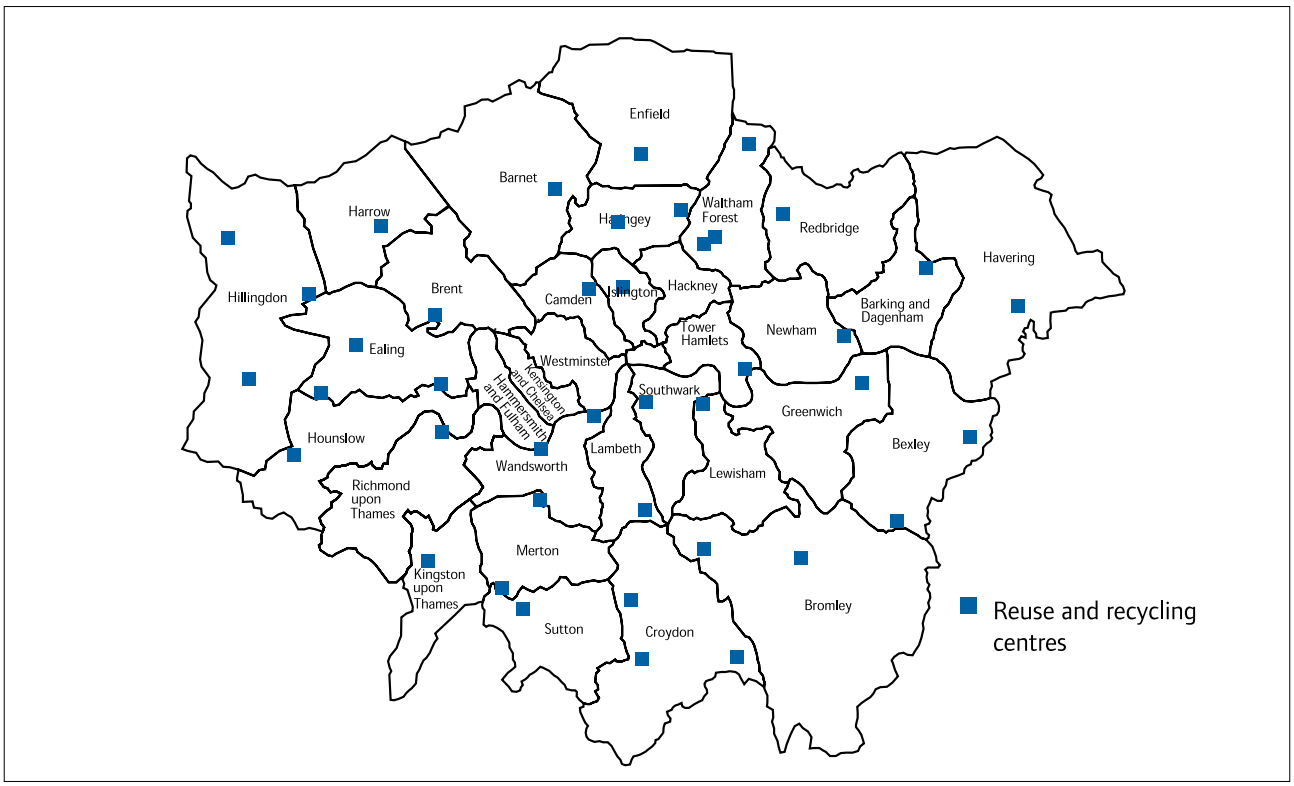
Non-household municipal waste

Today non-household municipal waste, made up primarily of waste from small businesses, represents about 21 per cent (835,000 tonnes) of municipal waste collected by or on behalf of London boroughs. In 2008/09, just ten per

cent of this waste was recycled or composted, against a national average of 31 per cent[13]. Under the Environmental Protection Act 1990, boroughs are obliged to make arrangements for the collection of non-household municipal waste where a business requests it. A charge can be made to cover costs associated with the management of this waste.

Boroughs are not obliged to provide businesses with recycling or composting services, although about two-thirds of London's boroughs do provide such services, most commonly for paper and/or glass[14]. The charges to businesses for recycling collections are typically less than those for mixed (black bag) waste, due to it being more expensive (depending on collection costs) to send waste to landfill or incineration than to send it for recycling or composting[15]. Indicative survey work with some boroughs showed that starting up (and running) cost-effective recycling services can be difficult where there are not enough businesses participating to offset collection costs. This is further compounded by the private sector targeting more lucrative waste contracts from large businesses, leaving smaller, less profitable waste contracts to be picked up by boroughs.

Figure 11: Location of Reuse and Recycling Centres in London



Source: Capital Waste Facts Fact File Matrix, www.capitalwastefacts.com (Last accessed 9 December 2009).

The Landfill Allowance Trading Scheme has provided a disincentive for boroughs to provide cost-effective services to small and medium-sized businesses. This is because the authorities that rely on landfill can significantly reduce the amount of waste going to landfill simply by withdrawing their business waste collections (often through pricing mechanisms). Considering non-household waste made up 21 per cent of municipal waste collected by London's unitary authorities and waste collection authorities in 2008/09, the potential for making savings this way is considerable.

As it is such a significant portion of London's municipal waste, it is important that recycling or composting of non-household municipal waste is made a priority. Furthermore small and medium-sized businesses that want to recycle see their local authority as their first port of call for such a service[16]. Well publicised and widely used business waste recycling services could offer significant opportunities to waste authorities to tackle climate change, improve their recycling rates, and offset some of their collection costs.

The government's recycling targets for household waste, along with LATS, have helped to improve the recycling of household waste, but the lack of targets for municipal waste as a whole has meant recycling rates for non-household waste have continued to languish. The Mayor will discuss with government how boroughs could be better incentivised to collect such waste for recycling. Views on this are welcomed.

What needs to be done

To achieve higher recycling or composting performance the Mayor believes recycling and composting need to be made as easy as possible for Londoners to do, whether they are at home, in the workplace or on the street.

Firstly, boroughs need to offer a core set of waste collection, recycling and composting services, irrespective of where Londoners live or work, and the type of property they occupy. In addition, the Mayor supports boroughs setting high recycling or composting targets to move London towards 60 per cent recycling or composting by 2031. Although this poses a big challenge, the Mayor's proposed targets match those set by the South London Waste Partnership and West London Waste Authority for their constituent boroughs. Together, they represent a third of London's municipal waste authorities. The targets are also in line with Local Area Agreement household recycling or composting targets, under which two-thirds of London boroughs are aiming to achieve, on average, 36 per cent recycling by 2011.

Providing consistent and accessible recycling services

The Mayor believes the greatest opportunities for improving London's recycling rate are in food waste collection services, services to flats, on-street recycling services, further plastics recycling, and business waste recycling services that are provided by or on behalf of boroughs.

Around 800,000 tonnes[17] of London's municipal organic waste goes to landfill each year. This waste could be used to generate renewable energy using anaerobic digestion and make

a substantial contribution towards achieving LATS requirements. The Mayor proposes to undertake research for the public consultation draft of the strategy to determine the levels of participation in recycling and food waste collections, looking at different collection methods and building types across London, to help boroughs share best practice. The research will also look at where there are opportunities for improvement in recycling or composting for small business (non-household) municipal waste. The research will inform how London could best achieve 50 per cent municipal recycling or composting rates by 2020 and 60 per cent by 2031.

The Mayor particularly wants to work with boroughs, housing associations, and Arms Length Management Organisations (ALMOs) to target London's social housing for boosting London's recycling and composting performance. Social housing makes up a large proportion of flats and estates in London. Thanks to the close association with the boroughs, this sector presents an excellent opportunity for working in partnership to boost local recycling and composting.

Many of London's social housing estates were constructed to allow for the disposal of waste but not for recycling or composting, making it difficult for boroughs to provide cost-effective and convenient services for residents to use. The Mayor will propose that the London Waste and Recycling Board look at funding infrastructure to significantly increase recycling rates from London's flats.

Retrofitting may include changes to chute design, new bespoke recycling facilities near entry points or putting existing recycling banks underground. It may also include small-scale "rocket" composting facilities, where food and garden waste can be quickly and efficiently composted and used for gardens on site. Any retrofit schemes funded by the board should aim to be integrated with other social housing retrofit programmes, and supported by communication programmes and revenue from boroughs.

Case Study: Business Food Waste Recycling in the London Borough of Bexley

The London Borough of Bexley introduced a commercial food waste recycling scheme in January 2007 for small and medium-sized businesses in the borough. The scheme was initially supported by WRAP and the LDA but has now been brought into Bexley's budget.

As an incentive to join the scheme, the first 70 customers enjoyed a reduced trade waste price of £126 per business (compared to the then £176 charge). Today the cost of the food waste recycling containers and starch bags are included in the £182 trade waste charge for a standard 140l bin so no additional payment is required to participate in the recycling scheme. Of the 1,500 businesses signed up to Bexley's trade waste collection scheme around 300 produce food. There are now 80 businesses signed up to the food waste scheme, which diverts 260 tonnes per annum from landfill and saves nearly 100 tonnes of $C0_2$eq each year.

Achieving the greatest greenhouse gas savings

To achieve the greatest greenhouse gas savings and value from recycled or composted materials, the collection system needs to provide the highest possible quality of recycled materials. For example London could save approximately 44,000 tonnes of CO_2eq every year if all of its glass was collected separately for recycling and made back into glass containers[18]. This is the equivalent of taking 14,000 cars off the road or avoiding over 2,000 return flights from London to Paris[19].

In contrast, glass recycled into aggregate provides negligible carbon benefits[20]. Source-separated collections of waste materials will typically result in high quality materials and, depending on the collection cost, can offer greater revenue compared to co-mingled collections thanks to the low levels of cross-material contamination. However, this may well change as material reclamation facilities (MRFs) are becoming more sophisticated at separating out clean materials for high value recycling.

As set out in Policy Two, the Mayor will take an outcome-based approach, based on the strategy's targets and lifecycle greenhouse gas performance, when determining whether municipal waste contracts are in general conformity with his Municipal Waste Management Strategy. In developing waste and recycling collection contracts, waste authorities will need to demonstrate how their services will contribute to delivering the standard of lifecycle greenhouse gas performance. This performance will look at the overall picture, across all waste authority waste management activities, and will be expressed as CO_2eq emissions or savings[21].

Ideally, recycling collections should accept as many materials as possible, in order to achieve the best CO_2eq savings. However, in developing their services, the Mayor expects boroughs to focus first on collecting those materials that achieve the greatest CO_2eq savings by being diverted from landfill. These include organic waste, mixed plastics, metals, paper and card, textiles, and glass containers, which make up approximately 80 per cent of the municipal waste stream.

The Mayor recognises infrastructure is necessary to develop anaerobic digestion, reuse, recycling, composting and treatment capacity in London. To warrant the investment in high quality services, and ensure the economic benefits of recycling and efficient energy recovery stay in London, Policy Five will set out what the Mayor proposes to do to develop waste infrastructure in London.

Improving recycling at Reuse and Recycling Centres (RRCs)

The Mayor wants to work with London's waste authorities to maximise recycling or composting performance at RRCs through good design and site layout. In November 2008, the GLA published a Recycling Rate Predictor Toolkit[22] alongside a Best Practice Design report. The toolkit allows waste authorities to predict likely recycling rate increases at RRCs and estimate the costs and savings of implementing new improvements. Such improvements include better signage, increasing the number of recycling banks, or re-orientating sites to maximise recycling or composting opportunities. The Mayor encourages boroughs and waste disposal authorities to use this Best Practice

Design report and Predictor Toolkit to improve local recycling and composting performance.

Opportunities should also be investigated for re-orientating and intensifying RRCs that support the development of treatment facilities, for example, or materials reclamation facilities (MRFs), and small-scale food waste and/or green garden waste composting.

Working with small and medium-sized businesses

The Mayor encourages boroughs to work with their local small and medium-sized businesses to realise the economic and environmental benefits of recycling. Lower disposal costs for recyclables and potential revenue from the materials collected for the boroughs can go hand-in-hand with lower collection charges to business, so that both sides benefit. Table Three shows potential opportunities if the paper produced from all of London's small and medium-sized businesses were recycled, estimating a net revenue potential of £80 million.

Table Three: Potential revenue from SMEs paper recycling[i]

London SME Paper Tonnage ('000t)	2200
Proportion going to landfill ('000t)	1100
Saving from not landfilling (£M)[ii]	+139
Cost to collect source segregated (£M) [iii]	-134
Potential revenue per tonne (£) [iv]	(68)
Total potential revenue (£M)	+75
Potential revenue + saving (£M)	**+80**

Notes:
i Defined as businesses with fewer than 250 employees. Source: Defra, Environment Agency 2009
ii Including residual waste collection cost, landfill gate fee and 2009/10 landfill tax totalling £126/tonne, Sources: Kerbside Recycling: Indicative costs and performance, WRAP, 2008; Gate Fees Report, WRAP, 2009
iii Based on collection cost of £122/tonne. Source: Kerbside Recycling: Indicative costs and performance, WRAP, 2008
iv Potential revenue figures based on assumption that all SME paper currently landfilled is instead sold at £68 per tonne. Refer: Kerbside Recycling Indicative costs and performance, WRAP, 2008 (Para 4.2.4)

The Mayor is keen to work with the London Waste and Recycling Board to help waste authorities provide cost effective business waste recycling or composting services equal to services offered to households. Support could come in the form of the Board providing funding for recycling collection vehicles, where linked to the development of new waste facilities, to help offset collection costs. Recycling or composting more non-household municipal waste may become an increasingly important issue for waste authorities following the government's recent announcement proposing a change in the way municipal waste is counted to include more commercial waste.

Developing incentives for Londoners to recycle

The Mayor supports rewarding households who regularly recycle instead of imposing potential charges on households who do not recycle, or who produce large quantities of waste. The Mayor is keen to see boroughs adopt incentive-based schemes, such as RecycleBank. RecycleBank is a scheme in which householders receive money-off vouchers for chains and local stores, or can choose to donate money to charity, to a value based on how much they recycle. The scheme can deliver a sustained increase in recycled municipal waste by giving households more incentive to recycle. The typical financial benefit to households in London could be about £14 a month, assuming an additional 100-200kg of recycling a year. The Mayor is keen to see a Recycle Bank trial in London during 2010.

The Mayor is keen to promote "on-the go" recycling services across London. The Mayor believes this can best be achieved by a combination of public funding and private sponsorship. The Mayor will be working with the GLA Group overall, in particular with London Underground, to improve on-the-go recycling significantly on the GLA's own estate. He also wants to explore funding opportunities with businesses and land owners for providing more recycling bins along main streets across London, integrated where practicable with local authority recycling services, to allow Londoners to recycle on the go.

Supporting local campaigns and initiatives to raise awareness of local recycling and composting services.

The Mayor believes local campaigns and initiatives to raise the awareness of London's residents and businesses on the value of recycling and composting, and on local collection services, are a key factor in improving London's recycling and composting performance. Policy 1 sets out the Mayor's policy and proposals for delivering a Londonwide reduce, reuse and recycling behaviour change campaign, linking with local initiatives.

Consultation questions

Do you agree that food waste collection services, recycling services to flats, on-street recycling services, and business waste recycling services offer the greatest opportunity for increasing recycling rates? Is there something else, if so, what?

Do you agree that incentives should be developed to encourage people to recycle more? What should be the key considerations when developing such an approach? What do you think the best incentive options are that we should develop in London?

Are you aware of any local recycling and composting campaigns that we might be able to bring together with regional initiatives through Recycle for London? If so, what are they?

What support might the Mayor best offer to improve recycling levels of small business waste?

If the Mayor were to lobby government to adopt a scheme that better incentivises boroughs to collect non-household municipal recyclables, what types of policies or incentives do you think would be most effective?

Are you aware of any effective solutions to providing recycling services to households that are not easily accessed from the street that might be rolled out across London? If so, what are they?

Do you agree with the Mayor's proposal to consider retrofitting existing flats and social housing estates with facilities to improve recycling rates?

Do you agree that establishing a network of "on-the-go" recycling bins should be done using public and private funds?

What do you think are the primary considerations when developing 'on-the-go' recycling bins across London?

Do you agree with the Mayor's approach to increasing municipal recycling or composting performance? What else could he do to help boroughs improve performance?

Endnotes

1 Where products from the anaerobic digestion process can be "used as a soil improver, as an ingredient in growing media or blended to produce a top soil that will meet British Standard BS 3882". Refer to National Indicator 192: Household waste recycled and composted.

2 Assumes 60 per cent recycling or composting rates across material streams, with paper and card, metals, plastics, organic waste, textiles, and glass making up approximately 90 per cent of municipal waste. The actual greenhouse gas savings will depend on the materials recycled.

3 Based on collection and disposal costs of £156 per tonne for waste sent to landfill. This comprises of collection costs of £64 per tonne, landfill gate fee of £22 per tonne, and 2013 landfill tax of £72 per tonne. Source: WRAP Gates Fees Report, 2009; Recycling collection and gate fee costs of £86 per tonne. Source: WRAP Kerbside Recycling: Indicative costs and performance report, 2008. Assumes organic waste is collected separately for treatment via anaerobic digestion at £126 per tonne. Source: GLA borough survey March 2009.

4 Based on (1) Average 2008/09 landfill rates for London waste authorities at £62 per tonne. Source: Gate Fees Report, WRAP, 2009 (2) Average residual collection cost of £64 per tonne. Source: Kerbside Recycling Indicative costs and performance report, WRAP, 2008

5 The recycling performance by 2020 is expected to be much higher because it will include an increase in the recycling of non-biodegradable waste, for example plastics, metals, glass and some textiles.

6 2008/09 DEFRA UK waste statistics.

7 Properties where waste is collected at the kerbside – usually excludes blocks of flat and large multi-occupancy properties.

8 Recycling collection service information taken from London borough websites and www.capitalwastefacts.com as of

December 2009.

9 London housing statistics: www.ons.gov.uk/census/index.html (Last accessed 16 December 2009).

10 "London Reuse and Recycling Centre Best Practice". Resource Futures, March 2008.

11 Recycling rates exclude inert waste (e.g. rubble, soils)

12 "On the go recycling", Report for the London Assembly Environment Committee, May 2009

13 Source: DEFRA waste statistics,2008/09, refer: www.defra.gov.uk/evidence/statistics/environment/wastats (Last accessed 15 Dec 2009).

14 Business waste collection services offered by London's unitary authorities and WCAs: www.capitalwastefacts.com/BoroughServiceInfo/SummaryTable/tabid/58/Default.aspx (Last accessed 15 Dec 2009).

15 The overall costs for providing waste collection services depend on a number of variables including the cost of collection (including transport), participation levels in the service, the quality of materials for recycling or composting, and the spot market price for recycled or composted material.

16 GfK, SMEs and sustainable waste management in London research findings, London Assembly, July 2007 (www.london.gov.uk/assembly/reports/environment/business-waste-strategy-response-app-a-gop-research.pdf), (Last accessed 15 Dec 2009).

17 Based on organic waste (kitchen food and green garden waste) making up 41 per cent of household waste. Govenment's Waste Strategy 2007 uses a 37 per cent figure from a study undertaken in 2001. 2008/09 Wastedata flow returns indicate a slightly higher proportion of food waste being in the residual waste stream, and therefore a higher proportion figure has been applied here. It is assumed household waste is similar in composition to municipal waste; London waste to landfill figures taken from Defra Waste Statistics, 2009, refer: www.defra.gov.uk/evidence/statistics/environment/wastats (Last accessed 15 December 2009).

18 Based on analysis of the impact of the carbon agenda on the waste management business, Grant Thornton and Oakdene Hollins, 2006

19 Greater London Authority calculation based on DEFRA emmission factors www.defra.gov.uk/environment/business/reporting/conversion-factors.htm

20 The case for a resource management strategy, Institute of Civil Engineers, January 2006

21 Policy Two of this strategy sets out the Mayor's proposals for agreeing a minimum lifecycle greenhouse gas performance for municipal waste management activities with London boroughs.

22 Toolkit can be found at www.capitalwastefacts.com/CaseStudiesResearchandModelling/ModellingTools/tabid/76/Default.aspx

Policy 5: Catalysing municipal waste infrastructure in London, particularly low-carbon technologies

Vision

London manages the bulk of its municipal waste within the Greater London area by investing in appropriate waste infrastructure.

From vision to policy

The Mayor, through the London Waste and Recycling Board, will work with waste authorities, businesses and other stakeholders to develop the municipal waste infrastructure in London.

From policy to action - proposals

Securing investment for waste infrastructure in London

- The Mayor and the boroughs, through the London Waste and Recycling Board fund, will provide financial assistance for the provision of facilities for the collection, treatment or disposal of waste produced in London.
- The Mayor and the boroughs, through the Board's brokerage service, will seek to involve external strategic partners who are able to make financial and in-kind investments to increase the value of the board's fund. This will be achieved through a number of mechanisms including the formation of joint ventures, where investors provide extra funding, and participation in other funding schemes such as EU match funding.
- The Mayor will work with the boroughs to demonstrate the case for continued funding for the Board beyond 2012 when current funding is scheduled to cease.

Catalysing waste infrastructure in London, particularly low-carbon technologies

- The Mayor, through the Board, will work with waste authorities and the private sector to develop new and existing waste facilities for reuse, recycling, composting and renewable energy in London.
- The Mayor, through the Mayor's Food to Fuel Alliance, will aim to deliver at least five exemplar food waste projects in London by 2012. The Food to Fuel Alliance will support food waste projects that generate renewable heat and power (including transport fuel), and compost material for local use.
- The Mayor will work with London's incinerator operators to look at making London's incinerators carbon neutral by using heat from the incineration process that is currently being wasted. The Mayor will examine the business case (including any state aid restraints) for an appropriate contribution to be made to these costs by such organisations as the London Waste and Recycling Board, the LDA and the Joint European Support for Sustainable Investment in City Areas (JESSICA) scheme.

Achieving regional self-sufficiency

- The Mayor, in reviewing municipal waste contracts and waste strategies, will work with waste authorities to intensify and re-orientate existing and planned waste sites in their control, to provide new facilities to treat more of London's municipal waste in London wherever possible. This covers all aspects of development, from good design of sites through to the development of new waste treatment and energy recovery facilities.
- The Mayor, through the London Waste and Recycling Board, will work with waste authorities, landowners and other stakeholders to develop a waste site framework, which would set out opportunities for developing new waste infrastructure, looking at the most suitable sites and surrounding land uses; and linking where appropriate to the LDA's heat map network and www.londonbrownfieldsites.org.
- The Mayor will hold an open dialogue with local authority leaders to identify where the opportunities are for developing waste infrastructure in London. The Mayor will also actively explore opportunities to use LDA- and TFL-owned land for managing municipal waste.
- The Mayor, when reviewing municipal waste management contracts, will consider the impact contracts may have on the implementation of any of his other strategies, in particular the London Plan and his air quality, climate change adaptation and climate change mitigation and energy strategies.
- The Mayor, when reviewing municipal waste management contracts, will work with waste authorities to promote the most sustainable forms of transporting waste, maximising the potential use of rail and water transport.

What this will achieve

The London Waste and Recycling Board will manage an £84 million fund from 2009-2012 to support the development of waste infrastructure in London. This has now been supplemented by a further £18 million in match funding from the European Regional Development Fund, through the JESSICA scheme. Other funding opportunities include the London Green Fund (£4 million) and London's European Structural Fund (£517 million).

Building new, cleaner waste facilities in London will help keep the value of London's waste within London, by providing a source of new products (including heat and power) and new jobs. New waste infrastructure will play an important role in London achieving zero municipal waste to landfill by 2025.

Generating more energy from London's organic waste and from non-recyclable waste will help London to fully integrate its waste management and energy sectors. Waste can form a local energy feedstock and contribute to London's energy security.

Why we need change

Today, just over half (approximately 56 per cent) of London's municipal waste is bulked up for treatment or landfill outside London and along with it goes the economic value of recovered materials for recycling or energy generation. London needs to invest in new waste facilities to manage more of its waste and reduce its reliance on other UK regions, and to retain the value of its waste through increased levels of reuse, recycling and energy recovery within London.

The London Waste and Recycling Board was set up to help address this issue and attract private investment to develop new waste infrastructure. The Board, chaired by the Mayor, has £84 million from both central government (£60 million) and the LDA (£24 million). The objective of the fund is to promote and encourage a reduction in waste and an increase in the proportion that is reused or recycled, as well as promoting methods of collection, treatment and disposal of waste that are more beneficial to the environment.

The Board has identified six priority waste materials that offer the best opportunities for improvement in treatment, given the proportion of those materials that currently go to landfill and the associated economic and environmental cost. These materials are paper and card, organic waste (including food waste), wood, mixed plastics, metals and textiles. More information about the Board, including its members and funding priorities, can be found at www.lwarb.gov.uk.

The Board's remit covers municipal, and commercial and industrial waste, and construction, demolition and excavation waste. However, it is estimated London's needs an additional 3.6 million tonnes of municipal waste infrastructure capacity alone by 2031. To develop that infrastructure, the Board's funds alone will not be sufficient.

It is estimated London needs the additional municipal waste infrastructure capacity in order to implement the Mayor's preferred approach for managing London's waste to 2031, in particular to:

- meet London's waste authorities' Landfill Allowance Trading Scheme (LATS) allowances by 2020
- achieve 60 per cent recycling or composting rates by 2031
- achieve zero municipal waste to landfill by 2025.

It is estimated that this additional infrastructure required for municipal waste could have capital costs in the region of £0.5-1 billion[1] and annual operational costs of between £71 million and £116 million. When the Board called for expressions of interest, over 170 projects applied for some form of funding or investment support, representing capital investments in excess of £1.2 billion, with declared funding requirements of over £300 million. The Board's current portfolio of project bids represents about five million tonnes of waste infrastructure per year, most of which would be for commercial waste[2].

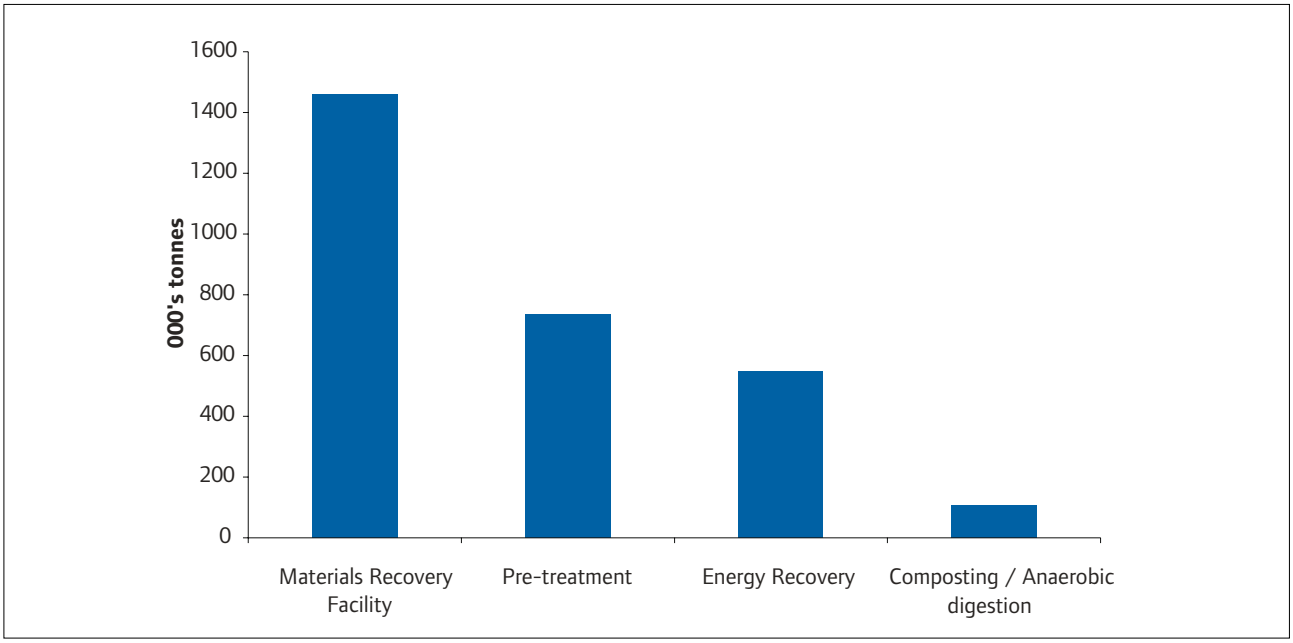
The funding for new infrastructure for London's municipal waste will need to be met through a mixture of public and private investment. There

are currently a number of funds in addition to the Board's funds which could contribute to developing waste management in London, including the London Green Fund (£4 million)[3], London's European Structural Fund (£517 million)[4] and participation in the JESSICA scheme (expected £18 million)[5].

Even with additional waste infrastructure, in the short to medium term, the Mayor expects landfill will continue to play a part in the management of certain types of waste, such as hazardous material, where landfill is currently the most appropriate means of disposal.

Energy recovery and pre-treatment processes such as mechanical biological treatment and autoclave also produce reject or inert residues (for example rubble, and contaminated silt and glass) for which landfill is often the only option. Material currently only suitable for landfill makes up about 10 per cent of municipal waste. It is expected this fraction will decrease over time as waste technologies improve to be able to recover more value from this waste. However the focus now needs to shift from landfilling unsorted, untreated waste containing recyclables and organic waste to the disposal of reject and inert residues from recycling, energy recovery and other treatment processes.

Figure 13: Estimated additional waste infrastructure capacity required to manage London's municipal waste to 2031



Notes: "Anaerobic digestion/composting" refers to treatment of separately collected organic waste.
"Energy recovery" refers to advanced conversion technologies including anaerobic digestion, gasification and pyrolysis of pre-treated waste. It may also include small scale incineration of biomass waste.

The Mayor expects an additional 120,000 tonnes of reuse capacity will also be required by 2031 in order to meet his target for three per cent of London's municipal waste to be reused by 2031. The greatest opportunities are for reusing appropriate waste materials direct from households (e.g. donations), local authority bulky waste collections, and reuse and recycling centres.

With the exception of the Belvedere incinerator, expected to open in 2011, the modelling used for Figure 13 assumes there will be no more additional mass-burn incinerators in London. The modeling further assumes that the SELCHP incinerator in Lewisham will continue operating until 2031[6] and the Edmonton incinerator will close by 2021[7].

Mass-burn incinerators are old, inefficient, CO_2-producing waste disposal methods that ultimately need to be replaced with cleaner and more efficient technologies. The Mayor expects approximately 535,000 tonnes of additional municipal energy recovery capacity will be required by 2031, and that this capacity will be met through cleaner technologies.

Advanced conversion technologies are becoming more commercially attractive as the technologies evolve with revised renewable energy generation incentives (in particular, renewables obligation certificates). To date, there are no advanced conversion facilities operating in the capital, although there are numerous operating examples, both in the UK and overseas. London has granted planning consent for its first commercial scale gasification facility and the London Waste and Recycling Board is currently working with partners on projects for about a dozen facilities using advanced conversion technologies in London.

Finally, the modeling used for Figure 13 assumes that as recycling performance increases (along with an increase in anaerobic digestion), the demand for material reclamation facilities will also increase. By contrast, it assumes the increase in recycling will ultimately lead to a decline – from a significant period of increase – in the capacity needed for the pre-treatment of waste over the longer term.

Achieving regional self-sufficiency

As part of Planning Policy Statement 10 (PPS10), the Mayor is required to identify the tonnages of municipal and commercial and industrial waste requiring management and to apportion them by waste planning authority area, as part of his London Plan. Similarly, the boroughs then need to identify sufficient land to provide capacity to manage the waste apportioned to them in the London Plan in their development plan documents.

Identifying the land to manage borough waste apportionments should be done by:

- Protecting and making maximum use of planned and existing waste sites
- Identifying sites in strategic industrial locations
- Identifying sites in locally significant employment areas
- Safeguarding wharves with an existing or future potential for waste management.

This strategy does not deal specifically with regional self-sufficiency or waste apportionment, as it is a planning issue dealt with in the London Plan. The London Plan is currently under review and key policies and proposals have been set out in *The London Plan – consultation draft replacement plan*, October 2009. This can be found at www.london.gov.uk/shaping-london/london-plan/docs/london-plan.pdf. The key waste policies in the London Plan include:

- Working towards zero waste to landfill by 2031
- Setting new recycling/composting targets
- Promoting waste management activities that achieve the greatest possible climate change mitigation benefits
- Managing as much of London's waste within London as practicable
- Commissioning new, independent, borough-level projections of London's waste arisings. This arisings data will be used to update London borough waste apportionment, using existing waste apportionment methodology
- Reviewing the definition of waste to be managed within London

London currently has 41 Reuse and Recycling Centres and approximately 800 other waste sites, most of which are privately owned[8]. The large majority of these sites are used to separate and bulk up waste materials for recycling and composting off site, or to send to landfill sites, mostly outside London, or incineration.

The possibilities for re-orienting and increasing capacity on existing sites are significant although new sites will also play a role. This could include re-developing existing sites to accommodate, where possible, material reclamation facilities, pre-treatment facilities (e.g. mechanical biological treatment and autoclave), reprocessing plants and energy recovery facilities.

What needs to be done

Securing investment for waste infrastructure in London

The Mayor, through London Waste and Recycling Board funding, will provide financial support for the development of waste infrastructure in London. The Board has committed £74 million to support waste infrastructure in London from 2009 to 2012, in its 2009/10 Business Plan which will be updated annually. A further £18 million in match funding from the European Regional Development fund will be leveraged in through the JESSICA scheme.

The Mayor, through the Board's brokerage service, will seek to involve external strategic partners who are able to make financial and in-kind investments to increase the value of the board's fund. This will be achieved through a number of mechanisms including:

- The formation of joint ventures, where investors provide extra funding.
- The commitment of long-term budgets to support projects initiated by the fund (particularly in the case of local authorities who are less likely to be able to raise capital funding)
- Participation in other funding schemes such as EU match funding.

Through the Board, the Mayor will also explore funding opportunities such as the Green Fund (£4 million) and London's European Structural Fund (£517 million). The Mayor will work closely with each of these potential funding streams to ensure that funding is obtained for London.

The Mayor expects that the London Waste and Recycling Board will continue supporting waste infrastructure in London and lever in additional funds. The Mayor, with the London Councils, will make a business case to government to continue funding beyond 2012, to ensure the board can continue to play an important role in waste investment in London.

Catalysing waste infrastructure in London, particularly low-carbon technologies

In partnership with the waste industry, the waste authorities and the Board, the Mayor will work to help develop new facilities and improve existing ones to offer the best environmental performance and economic benefits for London. This work will cover:

- Reuse centres
- Recycling sorting facilities (e.g. material reclamation facilities) that maximise the recovery of high quality materials.
- Composting facilities
- Pre-treatment facilities including mechanical biological treatment (MBT) and autoclave to recover recyclable material from residual waste
- Advanced conversion technologies such as anaerobic digestion, gasification and pyrolysis to generate renewable heat and power (including transport fuel)
- The provision for combined heat and power and combined cooling heat and power at existing facilities.
- Exploring opportunities to develop a heat network to connect to existing London incinerators to increase their overall efficiency.

The Mayor, through the Board's brokerage service, will facilitate the development of partnerships for new waste projects, particularly those delivering facilities using advanced conversion technologies. Approximately 150 companies have registered with the board's brokerage service[9]. The Mayor wants the first waste facilities to act as exemplars to encourage further investment in new waste technologies within London. A key element of the board's brokerage service will be building and maintaining relationships with stakeholders and delivery partners, and, where possible, integrating municipal and non-municipal waste projects.

Turning London's food waste into an opportunity

The Mayor will work with the Board, TfL, the LDA and the private sector to develop infrastructure for dealing with food waste in London. To this end, the Mayor has established the Food to Fuel Alliance, which will aim to promote at least five exemplar food waste projects in London, that deliver one or more of the following:

- Decentralised renewable heat and power
- Renewable transport fuel (bio-fuel) or fuel for use in electric vehicles
- Demonstrable links to hydrogen fuel cells
- Compost material for local use, linked to the Mayor's Capital Growth Programme.

The Food to Fuel Alliance includes representatives from the GLA, the London Waste and Recycling Board, the LDA, TfL and Capital Growth. The alliance will bring together local authorities, developers, land owners, finance providers, technology providers, energy companies and food waste producing companies (e.g. supermarkets, restaurants, markets etc.) to develop food waste projects, particularly anaerobic digestion projects, which are well suited to treating food waste.

Although there is a need for new waste infrastructure in London, the Mayor also wants to work with waste facility operators to enhance existing infrastructure, making it more efficient and improving its environmental performance. The greatest opportunity is in utilising the vast amounts of heat generated but not currently captured for use by London's existing incinerators in Lewisham and Edmonton. Nor are there currently any plans to use the heat from London's third incinerator at Belvedere, in Bexley, which is expected to be operational in 2011.

Research[10] commissioned by the GLA showed that incinerators generating energy from untreated waste, and operating in combined heat and power mode (CHP), are carbon neutral in that they create as much carbon dioxide through the combustion process as they avoid through energy generation. However, retrofitting heat networks that can utilise that wasted heat can be expensive and can have commercial risks. The Mayor wishes to understand, on a case-by-case basis, what the costs are, and whether there is a case for directing LDA, Board, or JESSICA scheme funding to help.

The Mayor expects new energy recovery facilities in London to operate in CHP mode where practicable, and through the board's brokerage service, will work with waste facility operators to ensure CHP opportunities are fully explored.

With regards to the existing landfill sites, the Mayor supports the conversion of landfill gas for energy generation. This energy generation could include the production of transport fuel that offers lower CO_2 emissions and less pollution from transport when compared to conventional fuels (petrol and diesel).

Achieving regional self-sufficiency

The greatest opportunity for managing more of London's waste within its boundaries is through the protection and development of London's existing and planned waste management sites. By working with the boroughs and waste disposal authorities, the Mayor is keen to ensure we use these sites to tackle London's waste challenge and help boroughs achieve their apportionment targets.

Ensuring good design of these sites will help to maximise reuse and recycling opportunities, and it will be important to explore opportunities for developing material reclamation facilities, reprocessing facilities, pre-treatment facilities, and energy recovery facilities.

As well as safeguarding and upgrading existing municipal waste sites, the Mayor will work with stakeholders to help identify additional sites in London where feasible. The Mayor is keen to see a joined up approach between GLA, the

boroughs and the London Waste and Recycling Board to help overcome planning contraints.

Such an approach would also enable all the key players in London to identify the opportunities for energy and heat use by neighbouring developments, linking with the London heat map developed by the LDA. The London heat map is an interactive online tool that allows users to identify opportunities for decentralised energy projects in London. The heat map provides spatial intelligence on factors relevant to the identification and development of decentralised energy opportunities, such as major energy consumers, fuel consumption and CO_2 emissions, energy supply plants, community heating networks and heat density. It can be found at www.londonheatmap.org.uk.

Within the GLA Group, the LDA's own land provides a further opportunity for waste infrastructure, and the Mayor has asked the LDA to actively explore this. The LDA also offers an online tool identifying all of London's brownfield sites which are suitable for redevelopment or reuse. This tool can be found at www.londonbrownfieldsites.org.

The Mayor will hold an open dialogue with local authorities to identify where there are opportunities to develop waste infrastructure in London. The Mayor will also actively explore opportunitiesto use land owned by other GLA functional bodies where appropriate for managing municipal waste.

In revising the London Plan, the Mayor is reviewing his self-sufficiency targets, the number and type of facilities London needs to manage its waste, and the land requirements for such facilities. The Mayor wants London's waste sites to move up the value chain so that more of the economic value of London's waste stays in London.

New waste facilities should be well designed and provide positive benefits to local communities in the form of new products, employment, and heat and power. They need not be bad neighbours and should be developed and designed in consultation with local communities, taking account of health and safety within the facility, the site, and adjoining neighbourhoods.

The Mayor, in implementing his Municipal Waste Management Strategy and determining local authority waste management contracts, will consider the impact contracts may have on the implementation of any of his other strategies, in particular the London Plan and his air quality, climate change adaptation and climate change mitigation and energy strategies. The London Plan and the Mayor's environment strategies collectively set out the optimal approach London should take to becoming a world leader in improving the environment locally and globally. Each document is complementary to the other and therefore consideration of the potential impact of each waste contract on any strategy will be considered.

Consultation questions:

Do you think the Mayor's proposals will successfully secure those elements of investment for London's waste infrastructure?

What else can the Mayor do to close the residual funding gap to deliver the waste infrastructure London needs?

Do you agree that the Government should continue to fund the London waste board beyond 2012? What would you want to see to be convinced this should occur?

Do you support the Mayor's vision to develop new and existing waste facilities for reuse, recycling, and renewable energy in London to move the city's waste management further towards self-sufficiency and catalyse further waste infrastructure?

Do you agree with the Mayor's vision to treat waste within London and as locally as possible to the source, to encourage self-sufficiency and to realise the value from waste disposal?

What do you see as the key issues that might arise in trying to improve and develop existing waste treatment facilities? Do you agree with the shift to only landfilling reject and inert residues from recycling and energy recovery?

Do you agree that the Mayor should be working to encourage more sites in London for new technologies to treat waste in a sustainable way? Do you see any problems with this; are there any considerations that should be made in taking this direction?

What are the key issues likely to arise when considering retrofitting London's incinerators to capture heat generated for local use?

Is there likely to be scope for undertaking this type of project?

Do you agree with the Mayor's support for the conversion of landfill gas for energy generation? What do you see as the main issues to achieving this?

Endnotes

1 Based on a range of capital and operational costs for waste infrastructure taken from *Introduction to Waste Technologies*, Waste Technologies UK Associates, January 2008.

2 London Waste and Recycling Board, 2009

3 The London Green Fund is a financing framework for energy efficiency measures to cut carbon across London. The fund is likely to target building retrofit decentralised energy and waste technology initiatives. The fund aims to leverage private investment to help enable the development of infrastructure required to meet the Mayor's 60 per cent carbon reduction target by 2025. www.lda.gov.uk/server.php?show=ConWebDoc.3391

4 The Structural Fund is the European Union's main instrument for supporting social and economic restructuring. It is used to tackle regional disparities and support regional development. www.berr.gov.uk/whatwedo/regional/european-structural-funds.

5 JESSICA is an initiative of the European Commission in co-operation with the European Investment Bank and the Council of Europe Development Bank, in order to promote sustainable investment, and growth and jobs, in Europe's urban regeneration areas.

http://ec.europa.eu/regional_policy/funds/2007/jjj/jessica_en.htm

6 Veolia, 2009

7 London Waste Limited, 2009

8 "Recycling and Recovery facilities: site investigation in London", GLA 2005.

9 As of November 2009.

10 "Greenhouse gas balance of waste management scenarios", GLA, January 2008.

Policy 6: Achieving a high level of street cleanliness

Vision

Londoners should enjoy a consistently high standard of street cleanliness regardless of where they are living, working or visiting in London.

From vision to policy

The Mayor will work with London boroughs, businesses and public transport providers to develop and implement a programme of work to make London being a clean and pleasant city to live in and visit.

From policy to action – proposals

The Mayor will:

- Support and develop education campaigns that aim to change behaviour on littering and fly-tipping.
- Write to government and request national funding for a behaviour change campaign on litter and chewing gum for London in the years leading up to 2012.
- Work with local authorities to improve enforcement of environmental crimes including litter and graffiti.
- Encourage boroughs to recycle or compost their street cleaning waste wherever practicable.
- Work with a range of partners including London boroughs and the private sector to provide on-street recycling opportunities and to recycle waste from London's events.
- Support campaigns such as the Capital Clean-Up campaign that deliver and encourage wider public involvement in such campaigns.
- Work with London Councils and the London boroughs to develop a road map towards a plastic-bag-free London.
- Work with gum manufacturers and London boroughs to reduce the blight of chewing gum on London's streets by piloting biodegradable gum in London.
- Explore the opportunity of working with London boroughs, tobacco companies and tobacco retailers to develop a Londonwide smoking-related litter campaign.
- Work with London Councils and the London boroughs to explore the opportunity for an online reporting and recording system for litter and fly-tipping.
- Work with Transport for London and London Underground to empower Londoners and visitors to be more responsible with their rubbish while on London's transport network.

What this will achieve

These proposals will improve the standard of cleanliness in London, with the aim of getting London to rank in the top quarter of English regions for street cleanliness.

Targeted Londonwide behaviour change campaigns for litter and fly-tipping will contribute towards a reduction in the presence of litter, fly-tipping and chewing gum, helping to reduce chewing gum staining ahead of the 2012 Olympic Games.

Littering will become increasingly unacceptable in London as the public is given more information about street cleanliness; is empowered to dispose of their litter responsibly through the provision of 'on-the-go' recycling bins; and becomes more aware of options such as personal/portable ashtrays.

Campaigns, such as those arranged through the Capital Clean-up campaign, will enable volunteers, community groups and local residents to reclaim areas of land for recreational or functional uses, such as planting vegetables. These campaigns not only clean up local areas, but also instil a sense of ownership and responsibility for plots of land that were otherwise blighted, abandoned and ignored.

Why we need change

The UK has been branded the dirty man of Europe for too long. The UK gained this reputation for two reasons: firstly, for the amount of waste we send to landfill as a nation and secondly, for a perception that the UK has a problem with litter. The latter is somewhat hard to establish, as there is no comparable data for Europe and the wider world.

We can, however, compare London's performance to the other English regions. Table Four sets out the Best Value Performance Indicator 199 regional benchmarks for 2007/08. This indicator (BV199) measures the percentage of land surveyed that is of a poor or unsatisfactory standard of cleanliness for litter, detritus, graffiti and fly-posting.

Table Four shows that London is currently ranked sixth out of the nine English regions for cleanliness when it comes to litter, third when it comes to detritus and fourth when looking at a combined score for litter and detritus (the BV indicator). London does however perform worse for graffiti (8th) and fly-posting (9th).

The cleanliness of London's streets remains a key issue for Londoners. Results of a 2009 Annual Survey of Londoners[1] showed that the most problematic issue affecting the quality of the environment in London is perceived to be litter (mentioned by 23 per cent), followed by pollution from traffic (20 per cent), fly-tipping (17 per cent) and climate change (16 per cent). One-fifth of respondents believed tackling litter was a priority for improving the quality of the environment. Furthermore, of respondents who were dissatisfied with their neighbourhood overall, 42 per cent say there is a problem with litter in London, and among respondents dissatisfied with London, the proportion is similarly high, at 39 per cent.

For visitors and commuters alike, the first impression of the cleanliness of London is its transport corridors and stations. London Councils has recently signed a Memorandum of Understanding with Network Rail on improving the cleanliness of land adjoining Network Rail land and the Mayor is keen to see if this joint approach will improve London's transport corridors. Trains and tube cars are another area for attention, especially following the increase in the number of free newspapers in circulation since 2003. Newspapers left on trains and in tube cars tend to attract other litter, such as coffee cups. London Underground and Transport for London have undertaken significant activity to improve the cleanliness of the tube and bus network but there is always more that can be done, and the Mayor is keen to help.

Year after year, Local Environmental Quality surveys identify the most prevalent type of litter on London's streets as cigarette ends and other smoking-related litter, found in around 95 per cent of survey samples. Cigarette ends are not only unsightly but are often washed into London's watercourses during heavy rainfall, causing harm to fish and birds due to the leaching of toxic chemicals. The Clean Neighbourhoods and Environment Act 2005 amended the Environment Protection Act 1990, providing clarity that cigarette ends are to be considered as litter and it is therefore an offence to drop cigarette ends on the ground or into any body of water.

Chewing gum dropped on the street continues to be an unsightly and costly problem for

Table Four: Best Value Performance Indicator 199 regional benchmarks 2007/08

BV 199 Regional benchmarks 2007/08 – percentage of land surveyed that was of a poor or unacceptable standard of cleanliness					
Region	**Litter**	**Detritus**	**Combined litter and detritus BV 199a**	**Graffiti BV 199b**	**Fly-posting BV 199c**
South West	12%	27%	20%	3%	1%
North East	13%	18%	15%	6%	0%
South East	15%	32%	24%	4%	1%
North West	15%	38%	26%	4%	1%
West Midlands	18%	35%	27%	6%	1%
London	20%	31%	25%	8%	2%
East Midlands	21%	32%	27%	5%	1%
East of England	23%	34%	29%	10%	1%
Yorkshire & Humber	23%	43%	33%	5%	1%

Note: Collected by Tidy Britain Group and published as part of the Local Environmental Quality Survey of England 2007/08 commissioned by Defra, www.keepbritaintidy.org/Expertise/Surveys/SurveyReports/Default.aspx
BV199 was replaced by National Indicator 195 in 2008/09
Detritus is defined as "non-living particulate organic matter".

London. We estimate that cleaning up chewing gum from London's streets costs between £5 million and £10 million per year, depending on the level cleaning undertaken. The last time Trafalgar Square was cleared of chewing gum, the bill came to £8,500. Chewing gum manufactures are beginning to develop solutions to this problem with at least one degradable chewing gum product now on the market.

How the London boroughs approach litter enforcement varies significantly across London. In the best case, the borough rigorously educates residents and visitors on what constitutes litter and the penalties for littering, followed up by active enforcement.

London Councils[2] estimates that in the UK over 13 billion plastic bags are issued to shoppers each year. That means the average person gets 220 plastic bags per year. On this basis, Londoners as a whole are given almost 1.5 billion plastic bags per year. This is not only a waste of resources but also often a contributor to London's litter. Plastic bags are a particularly difficult form of litter as they are easily blown about, often end up in our waterways, harm wildlife and look particularly unsightly when they are caught in trees. The public's view of plastic bags is changing and many retailers are leading the way by either charging for plastic bags, providing re-usable bags or rewarding shoppers for using their own bags. However, still more can be done.

London's Capital Standards programme, including the development of Street Academy, a London-centric enforcement training programme, has brought about a measureable improvement in the cleanliness of London's streets and a year-on-year improvement in public perception of street cleanliness. The Mayor is working with London Councils and Capital Ambition to develop a new programme of work that will lead to further improvements in Londoners' quality of life. Comments on what this programme should include and how it should operate are welcome.

What needs to be done

With the spotlight on London in 2012, London's streets need to be among the cleanest in England. The Mayor believes a National Indicator 195[3] (previously BV199) benchmark of six per cent for litter is both desirable and achievable by 2012 and would be sufficient to place London's average within the top performing quarter in England. To achieve this, London will need to take a unified approach with the GLA and London boroughs engaging with communities, landowners, transport providers, charity organisations and many other stakeholders, to ensure a consistent and coherent approach over the next few years.

The public's perception of the success of the Olympic Games is likely to be influenced by street cleanliness and access to recycling. If the 2012 Games are to achieve their goals for waste, then a co-ordinated approach to cleaning and on-street recycling is required for the whole of London. The Mayor will work with boroughs to continue to drive up standards. He also wants to see that campaigns such as Capital Clean-up gather momentum and support in the years running up to 2012, to help deliver a high level of cleanliness both during and after the Games.

High standards of cleanliness cannot be achieved simply by more cleaning before, during and after the Games. There also needs to be an element of behaviour change in the way Londoners and visitors interact with and react to litter. The Mayor will develop a programme of work with London Councils, London boroughs and Keep Britain Tidy that will aim to change people's behaviour towards litter and help restore civic pride. The Mayor will write to government and request national funding for behaviour change activity in London in the years leading up to 2012.

The Mayor will also work with Transport for London, London Underground, Network Rail and train operators to explore all opportunities to improve the cleanliness of our transport network and investigate how customers can be empowered to do the right thing with their litter, including by improving the provision of recycling and litter-bins wherever possible inside and outside stations and on platforms.

The Mayor wants Londoners to be informed and empowered when it comes to quality of life and the quality of the local environment. He is keen to establish greater access to information for Londoners and to improve the processes for reporting environmental crime. The Mayor wants to work with London boroughs to roll out a non-emergency reporting number and online reporting system and, in that context, develop data maps of environmental crime hotspots.

Enforcement has a role to play in addressing these issues. There is a raft of legislation available to local authorities to tackle street cleanliness and environmental crimes, but these are being interpreted and deployed to varying degrees across London. The Mayor will encourage London boroughs to adopt enforcement strategies that clearly set out how and when they will use the legislation. The Mayor will encourage consistency across boroughs in their enforcement strategies by promoting partnerships and the sharing of best practice.

Businesses need to take responsibility for litter that is generated as a result of their activities. Retail and take-away food outlets, for example, need to work with their local authority, neighbouring businesses or Business Improvement District to take action. Local authorities have legislative support[4] to work with businesses to reach agreement. Good examples include the agreement between London's free newspaper distributors and the City of Westminster to site paper recycling bins. In addition, the Mayor would like London to become a plastic-bag-free city and will work with London Councils, the Green 500 and the Mayor's Green Procurement Code signatories to determine the best way to achieve this goal.

Manufacturers need to be pro-active in reducing the blight of chewing gum. The Mayor is keen to work with gum manufacturers both to invest in educational campaigns in London to encourage proper disposal of gum, and to develop biodegradable or non-sticking gum alternatives. The Mayor is keen to work with manufacturers to pilot innovations in chewing gum and is considering hosting an 'innovations fair' for designers and manufacturers of chewing gum to place London at the forefront of solving the chewing gum problem.

Similarly the tobacco industry needs to take some responsibility for the prevalence of cigarette ends on our streets and in our watercourses. Innovations have been forthcoming with personal/portable ashtrays being available for purchase for some years now and often purchased by local authorities to distribute when enforcing litter offences. However they are only sold in a relatively small number of shops in London and most Londoners are not aware they can buy them. The Mayor will explore the opportunity of working with the tobacco industry and retailers to increase the awareness of the offence to drop cigarette ends, and offering the concept of portable ashtrays as one solution to the problem.

There continues to be a dearth of recycling bins for litter in London and few boroughs recycle street cleaning waste or litter. Londoners now expect to have the option to recycle their waste, whether at home or in the work place, and therefore not having that option outside can make people question why they bother at home. Leading drinks manufacturers estimate that 50 per cent of soft drinks purchases are consumed on the street and if this just goes into the litter bin, or worse still, is dropped into the gutter, this represents both an expensive mess and a wasted resource. The Mayor will work with London boroughs to increase the number of recycling bins for a core range of materials including paper, plastic bottles and cans.

Consultation questions

Do you think the Mayor should set a benchmark for street cleanliness in London?

Do you agree that stronger enforcement strategies across London would result in a reduction in litter?

Do you think government should direct more national funding for litter and chewing gum campaigns to London leading up to the Olympics?

Should the Mayor work with tobacco manufacturers for the purposes of raising awareness and changing the behaviour of smokers who drop cigarette ends on the ground?

What, if any, are the measures that you think are missing to achieve clean streets for London? Are there particular approaches or stakeholders that are important but not mentioned above?

Endnotes

1 www.london.gov.uk/mayor/annual_survey/2009/london-survey-topline-09.rtf
2 www.londoncouncils.gov.uk/banthebag/Shoppingbagskeyfacts.htm
3 National Indicator 195 = the percentage of land surveyed that is of a poor or unsatisfactory standard of cleanliness http://cleanliness-indicator.defra.gov.uk/
4 Clean Neighbourhoods and Environment Act 2005

Appendix 1

Legislative framework for managing london's municipal waste

The legislative context and drivers for change

This chapter sets out the legislative framework and policy drivers for delivering the Mayor's Municipal Waste Management Strategy.

The European Union

The European Commission's 6th Environmental Action Plan and the Framework Directive on Waste[1] provide the general strategy for waste management. They establish several principles:

- The Precautionary principle: where there is a reasonable grounds for concern that an activity is causing, or could cause, environmental damage then it is acceptable for policy makers to accept a lower level of evidence as to the risk when the consequences may be very costly or irreversible.
- The Prevention principle: the production of waste must be minimised and avoided where possible to limit the potential for harm.
- The 'Polluter pays' principle: places the responsibility for waste on the person or organisation that first produced it.
- The Proximity principle: waste disposal should take place as close to their point of production as possible, using the best practicable environmental option (BPEO).

There are a wide range of legislative controls on waste that have flowed from these principles with the 1999 EU Landfill Directive[2] being a primary example of this. To comply with the Landfill Directive the UK must meet stringent targets on the amount of biodegradable municipal waste (BMW) that can be landfilled of:

- 75 per cent of that produced in 1995 by 2010
- 50 per cent of that produced in 1995 by 2013
- 35 per cent of that produced in 1995 by 2020

The Landfill Allowance Trading Scheme (LATS) provides the mechanism for UK local authorities to achieve the European Directive landfill diversion targets. LATS is designed to provide a way for England to make its contribution to UK targets for reducing the amount of biodegradable municipal waste going to landfill, as set by the 1999 EU Landfill Directive. Under LATS, each waste disposal authority is given a landfill allowance, which decreases annually up to 2020, setting out how many tonnes of biodegradable municipal waste it can send to landfill. These allowances are tradable, and can be banked or sold by the waste disposal authorities if they do not need all of the allowance. At other times, allowances can be borrowed.

There are, however, restrictions on how allowances can be sold, banked or borrowed, to make sure England does not fail to meet the targets set by the Landfill Directive. Borrowing may not be used to supplement allowances in the target years – 2009/10, 2012/13 and 2019/20 – or in the years immediately preceding target years. Similarly, banking may not be used to supplement allowances in either the target years or the years immediately following target years.

Any waste disposal authority which uses landfill in excess of its allowance is liable to a financial penalty of £150 per tonne.

Revised Waste Framework Directive (WFD) 2008.
Member States are required to bring into force by 12 December 2010 the laws, regulations and administrative provisions necessary to comply with the revised Waste Framework Directive (WFD). The revised WFD re-enacts, repeals or revises three existing Directives: (i) the existing WFD; (ii) the Waste Oils Directive; and (iii) the Hazardous Waste Directive.

The main changes introduced by the revised WFD may be summarised as follows:

- Greater emphasis on resource efficiency and waste prevention as an objective of waste policy alongside protection of the environment and human health.
- The waste hierarchy is now a priority order (prevention; preparing for re-use; recycling; recovery (e.g. energy recovery); and disposal), but Member States may depart from it if doing so results in a better environmental outcome.
- Member States must put in place waste prevention programmes by the end of 2013. The Commission must report on progress in waste prevention by 2011 and by the end of 2014, it has to set waste prevention and decoupling objectives for 2020.
- Member States must achieve a target of re-using or recycling 50 per cent of household waste (including paper, metal, plastic and glass) by 2020; and achieve a target of re-using, recycling or recovering 70 per cent of construction and demolition waste by the same date. The government is currently seeking clarification on how this target would be applied across the different material streams, and clarification on how performance would be measured.
- Member States must set up separate collection for at least paper, metal, plastic and glass by 2015, where technically, environmentally and economically practicable and appropriate. (The UK has clarified that co-mingled collection can continue after 2015 where this is the best means of increasing recycling rates in the local circumstances).

Source: Page 75, Stage One: Consultation on the transposition of the revised Waste Framework Directive (Directive 2008/98/EC), A consultation document issued jointly by the Department for Environment, Food and Rural Affairs and the Welsh Assembly Government, July 2009. http://www.defra.gov.uk/corporate/consult/waste-framework/consultation.pdf

Planning Policy Statement 10: Planning for Sustainable Waste Management

Planning Policy Statement 10 (PPS10) sets out the Government's policy to be taken into account by waste planning authorities and forms part of the national waste management plan for the UK. It requires that a strategy for muncipal waste management is produced as a key component of regional spatial strategies, which also takes account of other spatial planning concerns including transport, economic growth, natural resources, regeneration and sustainable development. The key principles of PPS10 are as follows:

- To deliver sustainable development by driving waste management up the waste hierarchy.
- To enable sufficient and timely provision of

waste management facilities to meet the needs of communities.
- To help to implement the objectives of the national waste strategy, and its supporting targets, consistent with obligations required by the European legislation.
- To help to secure the recovery and disposal of waste without endangering human health, and harming the environment, and ensuring waste is disposed of as near as possible to its place of production.
- To achieve self-sufficiency in local and regional waste management that is reflective of the types and quantities of waste generated.
- To ensure that the layout and design of new developments support sustainable waste management.

Waste Strategy for England 2007

The government set out its vision for sustainable waste management in Waste Strategy for England in May 2007 (Waste Strategy 2007). The Mayor's Municipal Waste Management Strategy must be consistent with Waste Strategy 2007. The government's key objectives are to:

- Decouple waste growth (in all sectors) from economic growth and put more emphasis on waste prevention and reuse
- Meet and exceed the Landfill Directive diversion targets for biodegradable municipal waste in 2010, 2013 and 2020
- Increase diversion from landfill of non-municipal waste and secure better integration of treatment for municipal and non-municipal waste
- Secure the investment in infrastructure needed to divert waste from landfill and for the management of hazardous waste
- Get the most environmental benefit from that investment, through increased recycling of resources and recovery of energy from residual waste using a mix of technologies.

In addition to landfill diversion targets the Governmanet's Waste Strategy 2007 sets the following waste targets:

- Reducing the amount of household waste not reused, recycled or composted in 2000 by 29 per cent in 2010 with an aspiration for a 45 per cent reduction by 2020. This is equivalent to a fall of 50 per cent per person (from 450kg per person in 2000 to 225kg in 2020.
- Recycling and composting of household waste – at least 45 per cent by 2015, and 50 per cent by 2020.
- Recovery of municipal waste – 53 per cent by 2010, 67 per cent by 2015 and 75 per cent by 2020.

The government has decided against setting individual borough targets, preferring to set an overall national target, which will be monitored. This is because there are already statutory local authority targets for landfill diversion under the LATS. The government also believes it is not appropriate to set recycling targets for municipal and non-municipal waste due to different waste streams requiring different target and monitoring measures. The Mayor's Municipal Waste Management Strategy has to be consistent with the Waste Strategy 2007 but the Mayor believes municipal waste targets are also necessary for London to dramatically improve London's municipal recycling or composting performance.

Climate change

Since the first Mayor's Municipal Waste Management Strategy (September 2003)[3] the importance of tackling climate change has become a key priority.

In 2008, the Climate Change Act was passed requiring the government to reduce net UK greenhouse gas emissions by 80 per cent by 2050 against a 1990 baseline. The Climate Change Act also requires the government to set five year climate change budgets to meet statutory emission reduction targets for 2025 and 2050.

The Mayor is required under section 43 of the Greater London Authority Act 2007 to publish a Strategy containing policies and proposals relating to the following:

- Minimising emissions of carbon dioxide and other significant greenhouse substances from the use of energy in Greater London for the purposes of surface transport.
- Minimising emissions of carbon dioxide and other significant greenhouse substances from the use of energy in Greater London for purposes other than those of transportation.
- Supporting innovation, and encouraging investment, in energy technologies in Greater London promoting the efficient production and use of energy in Greater London.

The Mayor will be producing this strategy in early 2010.

Under the GLA Act, the Mayor is also subject to broader climate change duties as below.

361A Duties of Mayor and Assembly with respect to climate change

(1) The Mayor and the Assembly are each under a duty to address climate change, in relation to London.

(2) In the case of the Mayor, the duty consists of –

(a) to take action with a view to mitigation of, or adaptation to, climate change,

(b) in exercising any of his functions under this Act or any other Act (whenever passed), to take into account any policies announced by Her Majesty's government with respect to climate change or the consequences of climate change,

(c) to have regard to any guidance, and comply with any directions, issued to the Authority by the Secretary of State with respect to the means by which, or manner in which, the Mayor is to perform the duties imposed on him by paragraph (a) or (b) above.

This revised Mayor's Municipal Waste Management Strategy will seek to reduce municipal waste, use resources more wisely and promote efficient energy from municipal waste to reduce greenhouse gas emissions. It is therefore a fundamental tool in London's response to climate change.

The Greater London Authority Act 1999 and 2007

The Mayor is required to produce and keep under review a Municipal Waste Management Strategy. The first Strategy was published in September 2003 and contained policies to manage London's municipal waste (household waste and business waste collected by local authorities) through to 2020. The proposals (actions to implement the policies) were generally for the period through to 2006 and therefore now require updating.

Section 353(3A) of the GLA Act requires that where the Mayor revises his Municipal Waste Management Strategy then the Mayor must have regard to joint waste management strategies for areas where the disposal authority is not also a collection authority through authorities having a capacity to comment and alert the Mayor to these strategies in place and their effect. Local authorities will be invited to comment on this draft Strategy in respect of their waste strategies, and this will be dealt with more thoroughly during the public consultation stage in mid 2010.

The GLA Act was amended in 2007 and included changes governing waste. It requires waste authorities to notify the Mayor of new waste contracts before they are advertised and requires waste authorities to act in general conformity with the Mayor's Municipal Waste Management Strategy when undertaking their waste functions. The Mayor also has a power of direction under section 356 of the Greater London Authority Act, which he may use for the purposes of implementing his Municipal Waste Management Strategy. An amendment to the planning powers also gave the Mayor the power to become the planning authority, subject to a policy test, for waste facilities that treat over 50,000 tonnes of waste per annum, affect more than one borough and are of strategic interest.

As set out below, the revised Municipal Waste Management Strategy under section 41(4)(a) of the Greater London Authority Act, the Mayor has had regard to the GLA's principal purposes of:

Promoting economic development and wealth creation in Greater London

The revised Municipal Waste Management Strategy and all policies and proposals therein must have regard to promoting economic development and wealth creation. The following policies will directly improve economic development and wealth creation in Greater London:

- Policy 1 and the proposals therein;
- Policy 3 and the proposals therein; and
- Policy 5 and the proposals therein.

In the Policy chapters there is a full explanation of the expected results of each of the policies.

Overall a key aim of the revised Municipal Waste Management Strategy is to turn municipal waste into an opportunity that will create wealth and economic development in London and this has been an integral consideration in setting targets in this strategy. See Appendix 2 for more detail on targets set and the policies and proposals that aim to achieve them.

Promoting social development in Greater London

The revised Municipal Waste Management Strategy and all policies and proposals therein have had regard to promoting social development in Greater London. The following policies and proposals will directly improve social development in Greater London:

- Policy 1 and the proposals therein; and
- Policy 6 and the proposals therein.

In the Policy chapters there is a full explanation of the expected impacts of each of the policies.

More broadly, primary purpose of the revised Municipal Waste Management Strategy is to improve municipal waste performance in London. Benefits of this improved municipal waste performance will include cost savings, job creation and improved environmental performance, which will assist in promoting social development in Greater London.

Promoting the improvement of the environment in Greater London

A primary purpose of the revised Municipal Waste Management Strategy is to improve London's municipal waste performance, which will directly result in a better environment for Londoners to experience. Therefore the Municipal Waste Management Strategy and all policies and proposals therein have had regard to promoting the improvement of the environment in Greater London. The achievement of targets set out in this strategy aim to deliver an improvement in the environment in Greater London. All the policies and proposals in this strategy aim to deliver improvements to London's municipal waste management.

In addition, and as set out below, the Mayor has had regard to each of the following four statutory cross-cutting themes in section 41(4)(b) of the Greater London Authority Act of:

Promoting improvements in the health of persons living in Greater London

A primary purpose of the revised Municipal Waste Management Strategy is to improve London's municipal waste performance, which will directly result in a better environment for Londoners to experience. One ascpect of this will be to promote improvements in the health of persons living in Greater London.

Promoting the reduction of health inequalities between persons living in Greater London

A primary purpose of the revised Municipal Waste Management Strategy is to improve London's municipal waste performance, which will directly result in a better environment for Londoners to experience. We expect that health inequalities should be reduced as an indirect outcome of this strategy.

Contributing towards the achievement of sustainable development in the UK

A primary purpose of the revised Municipal Waste Management Strategy is to improve London's municipal waste performance, which will directly result in a better environment for Londoners to experience. Another primary purpose of the Strategy is to improve London's carbon emission outcomes that result from London's waste. This

will make London a more sustainable city. It also aims to create cost efficiences and jobs. All the policies and proposals seek to make a contribution to this outcome and Appendix 2 lists the contribution that the policies and proposals will make to achievement of the strategy's waste targets.

Contributing towards the mitigation of, or adaptation to, climate change and its consequences

A primary purpose of the revised Municipal Waste Management Strategy is to reduce London's carbon emissions that result from London's municipal waste. This will make London a more sustainable city in terms of its waste and carbon footprints. The following policies and proposals will directly contribute to the mitigation of climate change and its consequences:

- Policy 2 and the proposals therein; and
- Policy 4 and the proposals therein.

For example, achieving 60 per cent recycling or composting of municipal waste could save approximately 1.9 million tonnes of CO_2eq emissions.

In revising and implementing the Mayor's Municipal Waste Management Strategy, the Mayor has had regard under section 41(5) of the Greater London Authority Act to:

Have consistency with (a) national policies and (b) such international obligations as the Secretary of State may notify to the Mayor for the purposes of Section 41(5) of the Greater London Authority Act

This Appendix 1 and the "Legislative and policy context" section list the national and international policies and obligations considered and Appendix 2 outlines how policies and proposals each contribute to achieving them.

In revising the Municipal Waste Management Strategy, the Mayor has had regard to his section 41(9) of the Greater London Authority Act duty in setting London-based targets for municipal waste having had regard to targets or objectives set nationally, and performance indicators set by the Secretary of State, whether nationally or locally, which affect the exercise of functions by authorities involved in the implementation of the strategy. The Mayor has set targets that are not less demanding than any related targets or objectives set nationally.

Ensure that the strategy is consistent with each of his 11 other statutory strategies

See text below regarding the Mayor's other strategies.

The resources available for the strategy's implementation

The revised Municipal Waste Management Strategy has been drafted with the resources available in GLA's Environment team. In addition to this many of the proposals will require implementation by our stakeholders including the London boroughs, waste industry, third sector and London Waste and Recycling Board.

The modelling used to inform the development of the strategy has used best available costings. During the London Assembly draft consultation process, detailed economic modelling of the strategy will be undertaken and consulted on as part of the public consultation in summer 2010.

The public consultation draft of the Municipal Waste Management Strategy will include a detailed implementation plan setting out the actions required to implement the individual proposals, who will deliver dates by which actions are to be implemented and the costs/ savings of implementation, where possible.

The desirability of promoting and encouraging the use of the River Thames safely, in particular for the provision of passenger transport services and for the transportation of freight

The Mayor, when reviewing municipal waste management contracts, will work with waste authorities to promote the most sustainable forms of transporting waste, maximising the potential use of rail and water transport (e.g. see last proposal in Policy 5).

The effect on crime and disorder in areas within Greater London and the misuse of drugs, alcohol and other substances in those areas

The Strategy presumes that the policies and proposals in Policy 6 may have an indirect positive effect of reducing crime and disorder.

The London Waste and Recycling Board

A key development was the establishment of the London Waste and Recycling Board (the 'Board') bringing together the Mayor, London Boroughs, and other stakeholders involved in managing London's waste.

The Board was established in September 2008 and comprises eight members under the chairmanship of the Mayor and has an investment fund of £84 million over four years. The Board's objectives are to promote and encourage, in relation to London:

- The production of less waste;
- An increase in the proportion of waste that is reused or recycled;
- The use of methods of collection, treatment and disposal of waste that is more beneficial to the environment.

In doing so the Board is required to act in accordance with the Mayor's Municipal Waste Management Strategy and in general conformity with the London Plan. The Board published its first Business Plan in February 2009 describing the steps it will take to deliver its objectives in line with the current waste strategy for London. The Business Plan will be reviewed annually in order to taken into account any changes the Mayor may make to the waste strategy for London.

The Mayor's strategies

The London Plan 2008[4] sets London's planning framework including planning policies for waste. The Mayor's statutory powers of direction for waste (under section 356 of the Greater London Authority Act) are limited to municipal waste,

leaving the majority of London's waste outside the Mayor's policies and control. However, to deliver the London Plan the Mayor needs to provide a comprehensive strategic framework for all waste produced in London.

The London Plan is currently under review and key proposals have been set out in the *London Plan – Consultation Draft Replacement Plan, 2009*:[5]

- Manage as much of London's waste within London as practicable
- Create positive environmental impacts from waste processing
- Commission new, independent, borough-level projections of London's waste arisings
- Review the definition of waste to be managed within London
- Adopt a more flexible approach to self-sufficiency so that the carbon outcome of the treatment method and transportation are given greater consideration
- Adopt a "zero waste to landfill outside London" aspiration
- Set new recycling/composting targets
- Use the existing waste apportionment methodology
- Use the preference for new and emerging technologies but shift towards output-based specification to ensure the best possible environmental outcomes; and
- Move towards fewer, larger waste sites than previously envisaged but protect existing sites and work collaboratively with boroughs to identify strategic sites with potential for waste management.

The Mayor produced a draft Business Waste Management Strategy in 2008[6] that sets ambitious targets for business re-use and recycling, and energy generation from waste. The Mayor intends to update the Mayor's Draft Business Waste Strategy that will sit side by side with this Municipal Waste Management Strategy.

In addition, when revising and developing other Mayoral strategies such as the Climate Change Adaptation Strategy[7], Transport Strategy[8], Water Strategy[9], Climate Change Mitigation and Energy Strategy[10], Air Quality Strategy[11], and Economic Strategy[12], the Municipal Waste Management Strategy will be consistent with relevant policies and proposals in these documents.

Other European Directives and legislative drivers

There are a wide range of other European Directives and legislative controls on the production and management of waste, such as:

- Environmental Protection
  - Environmental Protection Act 1990
  - Environmental Protection (Duty of Care) Regulations (1991) (as amended)
  - Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991 (as amended)
  - Controlled Waste Regulations (1992) (as amended)
  - Clean Neighbourhoods and Environment Act 2005
  - Site Waste Management Plan Regulations 2005

- Environmental Permitting
  - Integrated Pollution Prevention & Control Directive 2008/1/EC
  - Waste Incineration Directive 2008/1/EC
  - Environmental Permitting (England and Wales) Regulations 2007 (as amended)

- Recycling and Landfill
  - Household Waste Recycling Act 2003
  - Landfill (England and Wales) Regulations 2002 (as amended)
  - Waste and Emissions Trading Act 2003
  - Landfill Allowance Trading Scheme (England) Regulations 2004 (as amended)

- Hazardous Waste
  - Hazardous Waste Directive 91/689/EEC [until 12 December 2010]
  - Hazardous Waste (England and Wales) Regulations 2005 (as amended)
  - List of Wastes (England) Regulations 2005 (as amended)

- Animal By-Products
  - Animal By-Products Regulation (EC) No. 1774/2002
  - Animal By-Products Regulation 2005 (as amended)

- Producer Responsibility: Packaging
  - Packaging and Packaging Waste Directive 94/62/EC
  - Packaging (Essential Requirements) Regulations 2003 (as amended)
  - Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended)

- Producer Responsibility: End-of-Life Vehicles
  - End-of-Life Vehicles Directive 2000/53/EC
  - End-of-Life Vehicles Regulations 2003
  - End of Life Vehicles (Producer Responsibility) Regulations 2005

- Producer Responsibility: Waste Electrical and Electronic Equipment (WEEE)
  - Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Directive 2002/95/EC
  - Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2008 (as amended)
  - Waste Electrical and Electronic Equipment Directive 2002/96/EC and Amendment Directive 2003/108/EC
  - Waste Electrical and Electronic Equipment Regulations 2006 (as amended)

- Producer Responsibility: Batteries and Accumulators
  - Directive (2006/66/EC) on Batteries and Accumulators and Waste Batteries and Accumulators
  - Batteries and Accumulators (Placing on the Market) Regulations 2008
  - Waste Batteries and Accumulators Regulations 2009

Endnotes

1 EU Directive on Waste 75/442/EEC as amended by Council Directive 91/156/EEC and adapted by Council Directive 96/350/EC
2 Council Directive 1999/31/EC on the Landfill of Waste
3 Rethinking Rubbish in London: The Mayor's Municipal Waste Management Strategy 2003
4 The London Plan: Spatial Development Strategy for Greater London (Consolidated with Alterations Since 2004), 2008
5 The London Plan: Spatial Development Strategy for Greater London (Consultation Draft Replacement Plan), 2009
6 Making Waste Work in London: The Mayor's Draft Business Waste Management Strategy, 2008
7 The London Climate Change Adaptation Strategy: Draft Report 2008
8 The Mayor's Transport Strategy: Public Draft 2009
9 The Mayor's Draft Water Strategy: Draft for Public Consultation 2009
10 Green Light to Clean Power: The Mayor's Energy Strategy 2004
11 Clearing the Air: The Mayor's Draft Air Quality Strategy for Consultation with the London Assembly and Functional Bodies 2009
12 Rising to the Challenge: The Mayor's Economic Development Strategy for Greater London: Public Consultation Draft 2009

Appendix 2

The Mayor's municipal waste targets contributing towards national waste targets.

This section sets how the Mayor's policies and proposals contribute towards achieving the Mayor's targets to implement his preferred approach for managing London's municipal waste. By achieving the Mayor's targets, London will collectively meet or exceed London's waste authorities' Landfill Allowance Trading Scheme (LATS) allowances, and the government's national targets.

London needs a significant increase in municipal waste infrastructure to achieve the Mayor's municipal waste targets. Policy 5 sets out the Mayor's proposals for increasing this infrastructure. In addition to the Mayor's policies and proposals, the GLA is aware of new municipal waste infrastructure London's waste authorities have procured or is linked to an existing waste contract in London. This planned infrastructure, set out in Table 5, has been factored into the modeling undertaken for implementing the Mayor's policies and proposals. The GLA will update its modeling with any new municipal waste infrastructure procured in developing the next draft of this strategy. The updated modeling will include, where appropriate, procured municipal waste capacity being bid for via the London Waste and Recycling Board. The Board's current portfolio of project bids represents about five million tonnes of waste infrastructure per year, most of which is for commercial waste.

Table 5: Procured new municipal waste infrastructure in London

Technology	2009 capacity (tonnes per year)	Planned capacity (tonnes per year)	Expected to come on line
Material Reclamation Facilities (MRFs)	88,000	168,000	2010-2014
Mechanical Biological treatment (MBT)	244,000	88,000	2014
Anaerobic Digestion	10,000	12,000	2010
Incineration	1,050,000	450,000*	2011
Unspecified		480,000	2015
TOTAL	1,392,000	1,148,000	

*Belvedere incinerator – planned capacity is approximately 585,000 tonnes per year. It is assumed that 450,000 tonnes of this capacity each year will be for London's municipal waste.

The Mayor's targets are for London to achieve as a whole, placing no requirement on individual waste authorities to achieve them. In some cases the Mayor's targets do not exactly match those set by government for the UK. The Mayor's targets are more ambitious than those set by the government and reflect regional circumstances, such as:

- the declining landfill capacity accepting London's municipal waste;
- the need to significantly improve municipal recycling or composting performance - London is the lowest performing region in the UK.
- the need to significantly increase the amount of waste managed within London to achieve greater self-sufficiency in line with Planning Policy Statement 10.

All the Mayor's policies and proposals contribute towards meeting his targets. The tables and figures below set out the key policies and proposals that contribute towards achieving the Mayor's targets, London waste authorities' LATS requirements, and the targets set by government for the UK. Justification is given where the Mayor's targets do not directly correlate with those targets set by government.

Mayor's target	Justification	National Policy requirement
Achieving zero municipal waste to landfill by 2025.	• The Mayor in his London Plan (consultation draft Oct 2009) wants London to manage the bulk of its waste within London and work towards zero waste (all waste) to landfill by 2031. • Landfill sites accepting London's municipal waste (mostly outside London) are expected to close by 2025. • 2025 represents a realistic timeframe for new waste infrastructure to be built in London to divert waste from landfill.	London waste authorities meeting their LATS allowances
Key policies and proposals delivering the Mayor's target		
Policy 1: Inform producers and consumers of the value of reducing, reusing and recycling. *Proposals* • The Mayor, through London Waste and Recycling Board funding, will allocate £5.6 million across the life of the board fund (2009-2012) for waste reduction, reuse and recycling campaigns. • The Mayor, through the Recycle for London campaign, will promote Zero Waste Places projects in London as a means to showcase best practice and encourage London boroughs to participate in the scheme. • The Mayor will work with businesses through the Mayor's Green Procurement Code and the Green 500 to agree a Charter on reducing municipal waste.		
Policy 2: Setting a greenhouse gas standard for municipal waste management activities to reduce their impact on climate change. *Proposals* • The Mayor will work with waste authorities to implement the Mayor's waste hierarchy in the development of municipal waste contracts and in waste management activities, to achieve the greatest possible greenhouse gas savings.		
Policy 3: Capture the economic benefits of waste management *Proposals* • The Mayor will seek to provide investment, through the London Waste and Recycling Board, to help the waste authorities and the private sector establish waste management facilities that achieve the greatest reductions in greenhouse gas emissions.		

Policy 4: London to achieve 60 per cent recycling or composting performance by 2031.

Proposals

- The Mayor will work with boroughs and the London Waste and Recycling Board to help boroughs provide recycling and composting collection services to small businesses comparable to those services provided to households.
- The Mayor explore the potential with the London Waste and Recycling Board to fund infrastructure to encourage increase in recycling rates from flats, particularly social housing, to help retrofit London's social housing as a way to improve London's municipal waste recycling and composting performance.
- The Mayor will work with waste authorities to provide positive incentives for Londoners to recycle and compost.

Policy 5: Catalysing municipal waste infrastructure in London, particularly low-carbon technologies

Proposals

- The Mayor and the boroughs, through the London Waste and Recycling Board fund, will provide financial assistance for the provision of facilities for the collection, treatment or disposal of waste produced in London.
- The Mayor will work with the boroughs to demonstrate the case for continued funding for the board beyond 2012 when current funding is scheduled to cease.
- The Mayor, through the board, will work with waste authorities and the private sector to develop new and existing waste facilities for reuse, recycling, and renewable energy in London.
- The Mayor, through the Mayor's Food to Fuel Alliance, will aim to deliver at least five exemplar food waste projects in London by 2012.
- The Mayor, in reviewing municipal waste contracts and waste strategies, will work with waste authorities to intensify and re-orientate existing and planned waste sites in their control, to provide new facilities to treat more of London's waste in London wherever possible.

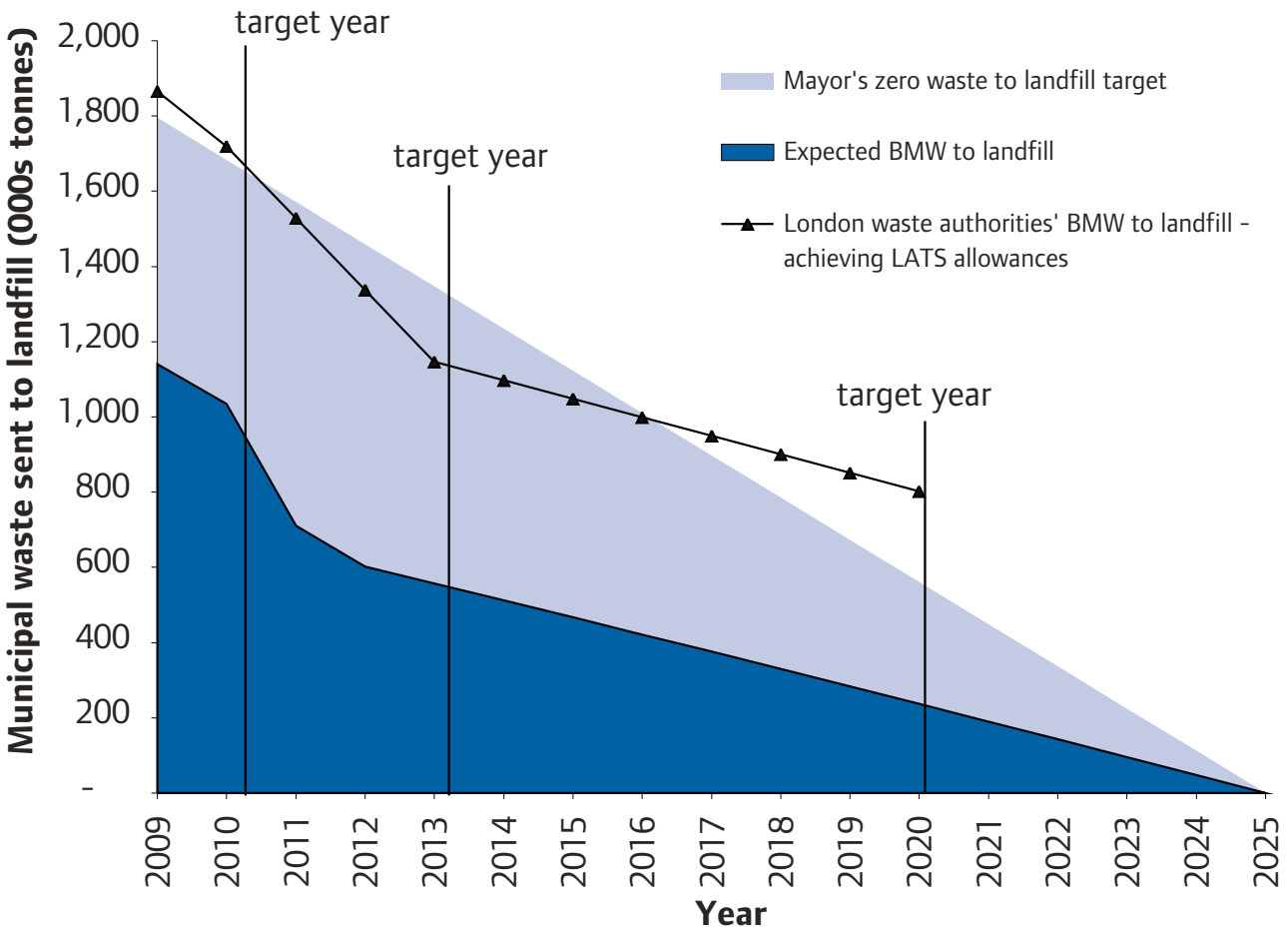
Policy 6: Achieving high levels of street cleanliness

Proposals

- The Mayor will work with a range of partners including London boroughs and the private sector to provide on-street recycling opportunities and to recycle waste from London's events.

Figure 14 sets out the impact achieving zero municipal waste to landfill by 2025 has on achieving London waste authorities' LATS allowances for biodegradable municipal waste (BMW) sent to landfill by 2020. For the purposes of implementing the LATS, it is assumed 68 per cent of waste sent to landfill is biodegradable. Applying this proportion, London's waste authorities are expected to collectively meet their LATS allowances by 2020.

Figure 14: Achieving zero municipal waste to landfill by 2025

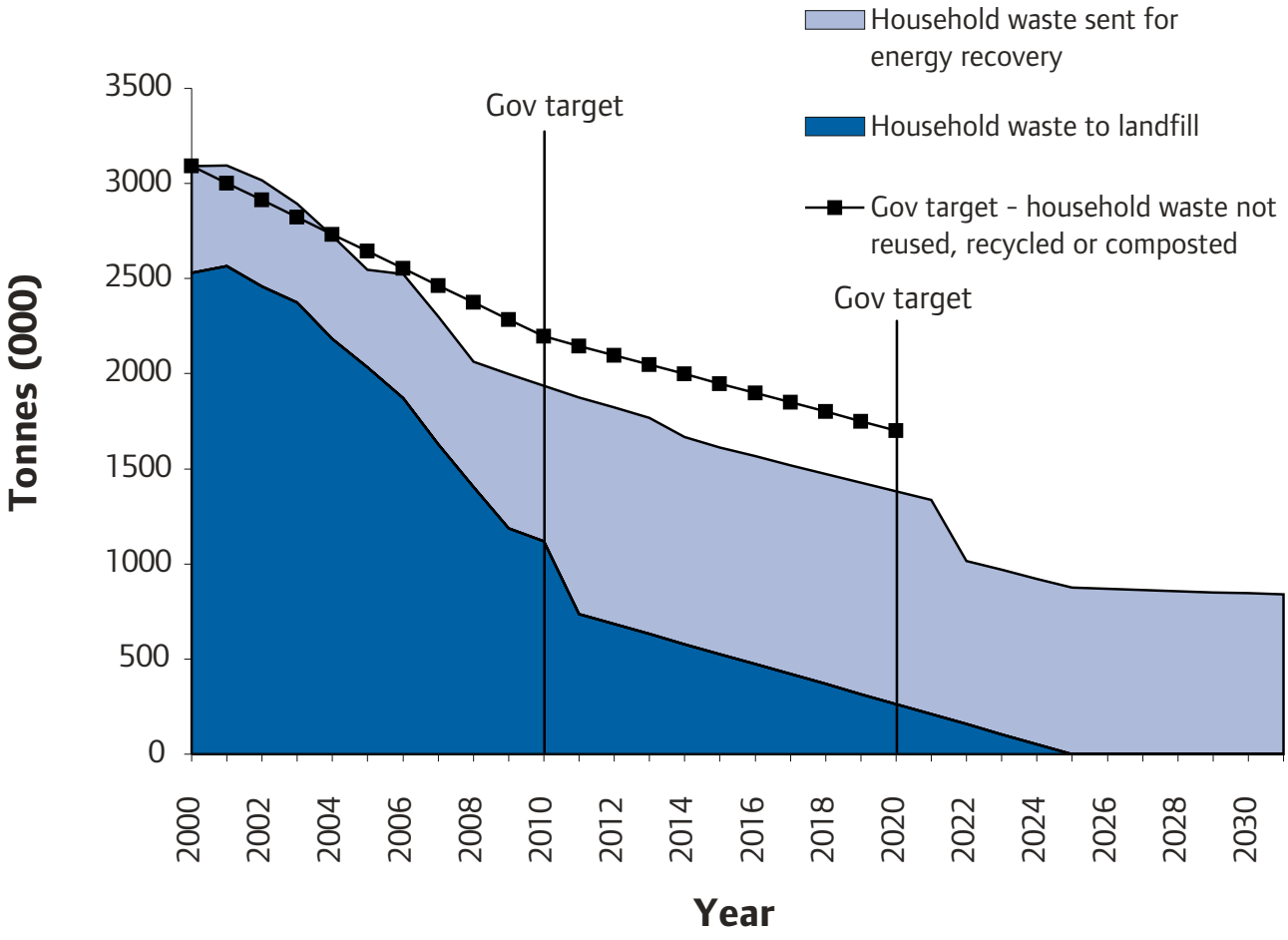


Mayor's target	Justification	National Policy requirement
To reduce the amount of household waste produced in 2008/09 from 970kg per household to 790kg per household by 2031. This is equivalent to a 20 per cent reduction per household.	• The Mayor believes greater economic and environmental benefits can be achieved by reducing waste at source as opposed to focusing on reducing waste not reused, recycled or composted. • The Mayor's reduction target reflects decreasing annual levels of household waste produced since 2006/07.	To reduce the amount of household waste not reused, recycled or composted (residual waste) in 2000 by 29 per cent in 2010 with an aspiration to achieve a 45 per cent reduction on 2000 levels by 2020;
Key policies and proposals delivering the Mayor's target		
Policy 1: Inform producers and consumers of the value of reducing, reusing and recycling. *All Proposals*		
Policy 2: Setting a greenhouse gas standard for municipal waste management activities to reduce their impact on climate change. *Proposals* The Mayor will work with waste authorities to implement the Mayor's waste hierarchy in the development of municipal waste contracts and in waste management activities, to achieve the greatest possible greenhouse gas savings.		

The Mayor has set targets to reduce the amount of household waste produced by each London household by 2031. This differs from the government's targets which are to reduce the amount of UK household waste not reused, recycled or composted by 2020. Achieving the government's targets effectively means reducing the amount of UK household waste used for energy recovery or sent to landfill.

Figure 15 shows how much household waste London is expected to send for energy recovery or to landfill by 2031. The trajectory shows a declining amount of London's household waste expected to be managed this way, comfortably lower than what is required to meet the government's household waste reduction targets. In addition, the government's reduction targets will be achieved by London's waste authorities increasing their recycling and composting performance, resulting in less household waste going to landfill or energy recovery.

Figure 15: Achieving the Mayor's household waste reduction targets



Note: The sharp decline in energy recovery levels from 2021 is a result of London's Edmonton incinerator closing in 2021 combined with an increase in reuse, recycling and composting performance.

Mayor's target	Justification	National Policy requirement
1. To increase the amount of London's waste that could be reused or repaired from approximately 10,000 tonnes each year in 2008 to 40,000 tonnes a year in 2012 and 120,000 tonnes a year in 2031. 2. To recycle or compost at least 45 per cent of municipal waste by 2015, 50 per cent by 2020 and 60 per cent by 2031. 3. The Mayor has not set municipal waste recovery targets.	1. The Mayor's reuse target has been set following discussion with the London Community Recycling Network as to what is reasonably achievable. 2. The Mayor is required to produce a municipal waste strategy, and has therefore set municipal recycling or composting targets. The targets match those set by the South London Waste Partnership and West London Waste Authority for their constituent boroughs. Together, they represent about one third of London's municipal waste authorities. 3. In line with the waste hierarchy, in most cases recycling or composting waste achieves the greatest environmental benefits, and therefore should be given priority over energy recovery by setting separate recycling or composting targets. The Mayor believes setting recovery targets may cause confusion for waste authorities on whether they should focus on achieving the Mayor's recycling targets or recovery targets, of which recycling or composting would form a part of. The Mayor's preferred approach includes energy recovery from any waste remaining after reuse, recycling and composting options have been exhausted. The government's recovery targets are achieved as a result of this approach.	1. Recycling (including reuse) and compost of household waste - at least 40 per cent by 2010, 45 per cent by 2015 and 50 per cent by 2020. 2. Recovery (including recycling or composting) of municipal waste - 53 per cent by 2010, 67 per cent by 2015 and 75 per cent by 2020.

Key policies and proposals delivering the Mayor's target

Policy 1: Inform producers and consumers of the value of reducing, reusing and recycling.

Proposals

- The Mayor, through London Waste and Recycling Board funding, will allocate £5.6 million across the life of the board fund (2009-2012) for waste reduction, reuse and recycling campaigns.
- The Mayor will work with London boroughs, the London Waste and Recycling Board and the London Community Recycling Network to develop a London Reuse Network, promoting waste reduction and reuse initiatives in the third sector, such as furniture reuse schemes, which can support existing local authority waste collection services.
- The Mayor will identify leading businesses to work with the London Waste and Recycling Board as a network of mentors to small businesses wanting to improve resource efficiency and reduce waste.

Policy 2: Setting a greenhouse gas standard for municipal waste management activities to reduce their impact on climate change.

Proposals

- The Mayor will work with waste authorities to implement the Mayor's waste hierarchy in the development of municipal waste contracts and in waste management activities, to achieve the greatest possible greenhouse gas savings.

Policy 3: Capture the economic benefits of waste management

Proposals

- The Mayor will work with London waste authorities on a best practice review of revenue-sharing opportunities in waste management contracts.
- The Mayor will investigate the economics of co-mingled collection of recyclable waste (collecting all recyclables together) and kerbside sort (separating recyclable materials as they are collected), and a blend of the two, to determine the most cost-effective services, taking into account local considerations.
- The Mayor will work with the waste authorities to tackle barriers that make it hard for the third sector to deliver local authority reuse and recycling services.
- The Mayor will undertake more research into the costs of managing London's municipal waste through different mechanisims.

Policy 4: London to achieve 60 per cent recycling or composting performance by 2031.

All Proposals

Policy 5: Catalysing waste infrastructure in London, particularly low carbon technologies

All Proposals

Policy 6: Achieving high levels of street cleanliness

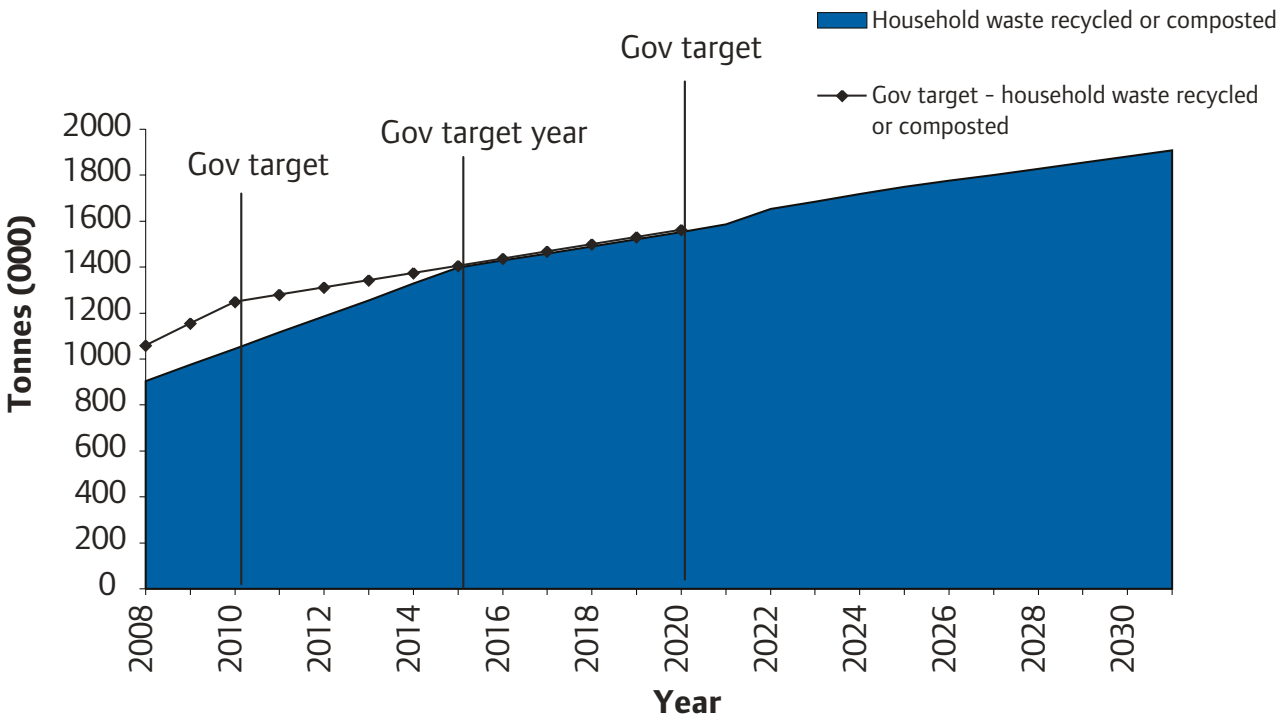
Proposals

- Encourage boroughs to recycle or compost their street cleaning waste where practicable.
- Work with a range of partners including London boroughs and the private sector to provide on-street recycling opportunities and to recycle waste from London's events.

The Mayor has set municipal waste recycling or composting targets matching the government's household recycling or composting targets for the UK. Household waste makes up about 80 per cent of London's municipal waste. The other 21 per cent of non-household waste is mostly made up of small business waste collected by London's waste authorities. In 2008/09 London recycled or composted 29 per cent of its household waste. Only about 10 per cent of London's non-household waste is recycled or composted each year. The Mayor believes that municipal recycling or composting targets are necessary to significantly improve both household and non-household recycling or composting performance.

Based on current recycling or composting performance (29 per cent), the Mayor does not expect London to meet the government's 2010 household waste recycling or composting target of 40 per cent. Achieving the Mayor's municipal waste recycling or composting targets in 2015 and 2020, London is expected to meet the government's 2015 and 2020 household waste recycling targets. Achieving the Mayor's reuse targets will contribute three per cent towards London's recycling or composting performance by 2031.

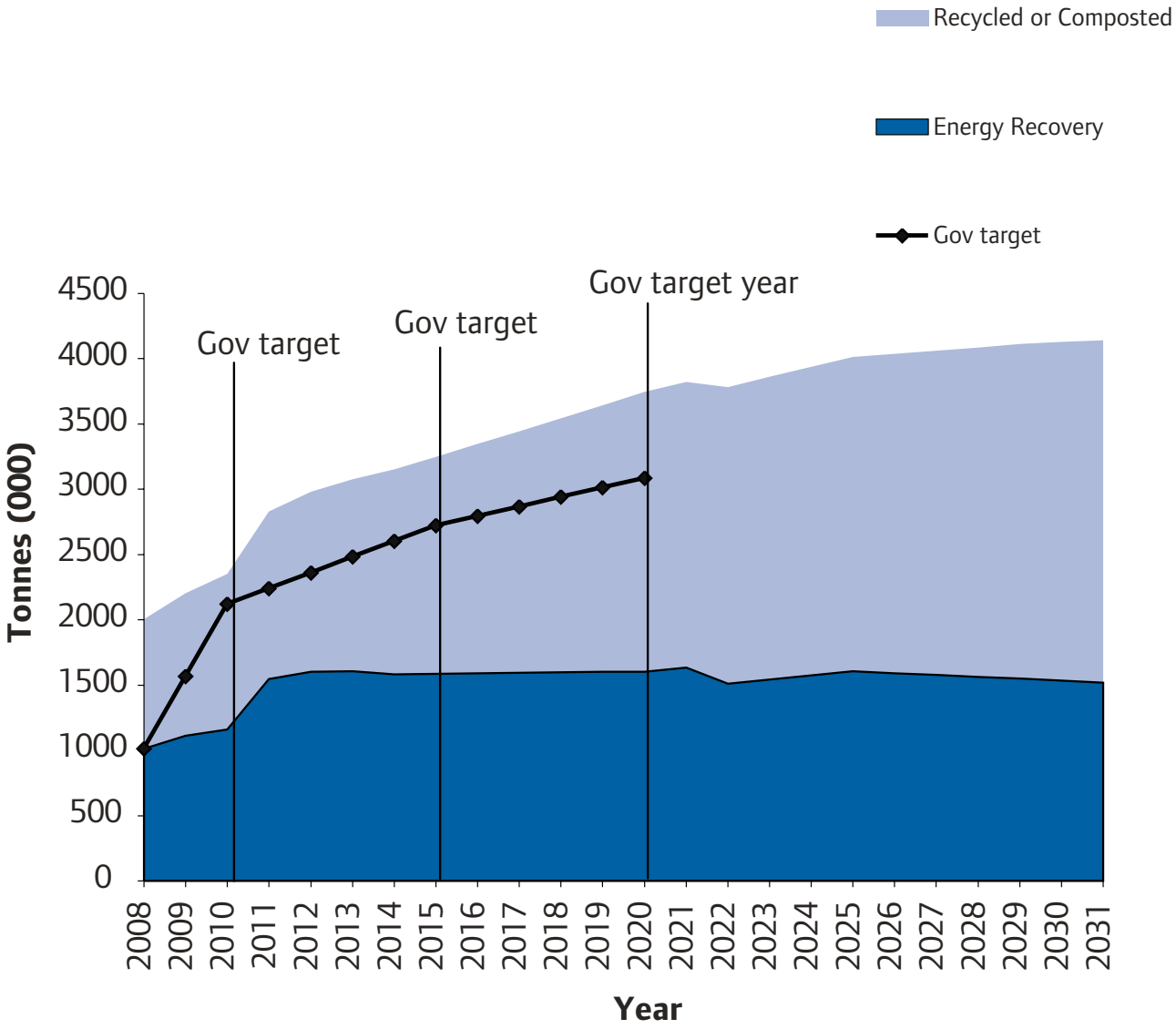
Figure 16: Achieving the Mayor's municipal recycling or composting targets



The Mayor has not set municipal waste recovery targets. However it is possible to deduce an excepted municipal waste recovery performance by looking at the amount of municipal waste left over after achieving the Mayor's recycling or composting targets. Today about 23 per cent of London's municipal waste is sent for energy recovery via mass-burn incineration. This proportion is expected to increase when London's third incinerator, Belvedere, in Bexley becomes operational in 2011. The Mayor does not wish for any further increase in mass burn incineration capacity in London. The Mayor believes any further increase in mass burn incineration capacity will crowd out recycling and provide little incentive for the development of whatever cleaner technologies are emerging, including anaerobic digestion, gasification and pyrolysis. The Mayor expects additional energy recovery capacity to be taken up using such cleaner technologies.

The Mayor expects London to recover energy from 30-35 per cent of its municipal waste by 2020. This proportion, combined with an expected municipal recycling or compositing performance of 50 per cent by 2020, will achieve an 80-85 per cent municipal waste recovery rate. This performance will exceed the government's 75 per cent target by 2020, as shown in figure 17.

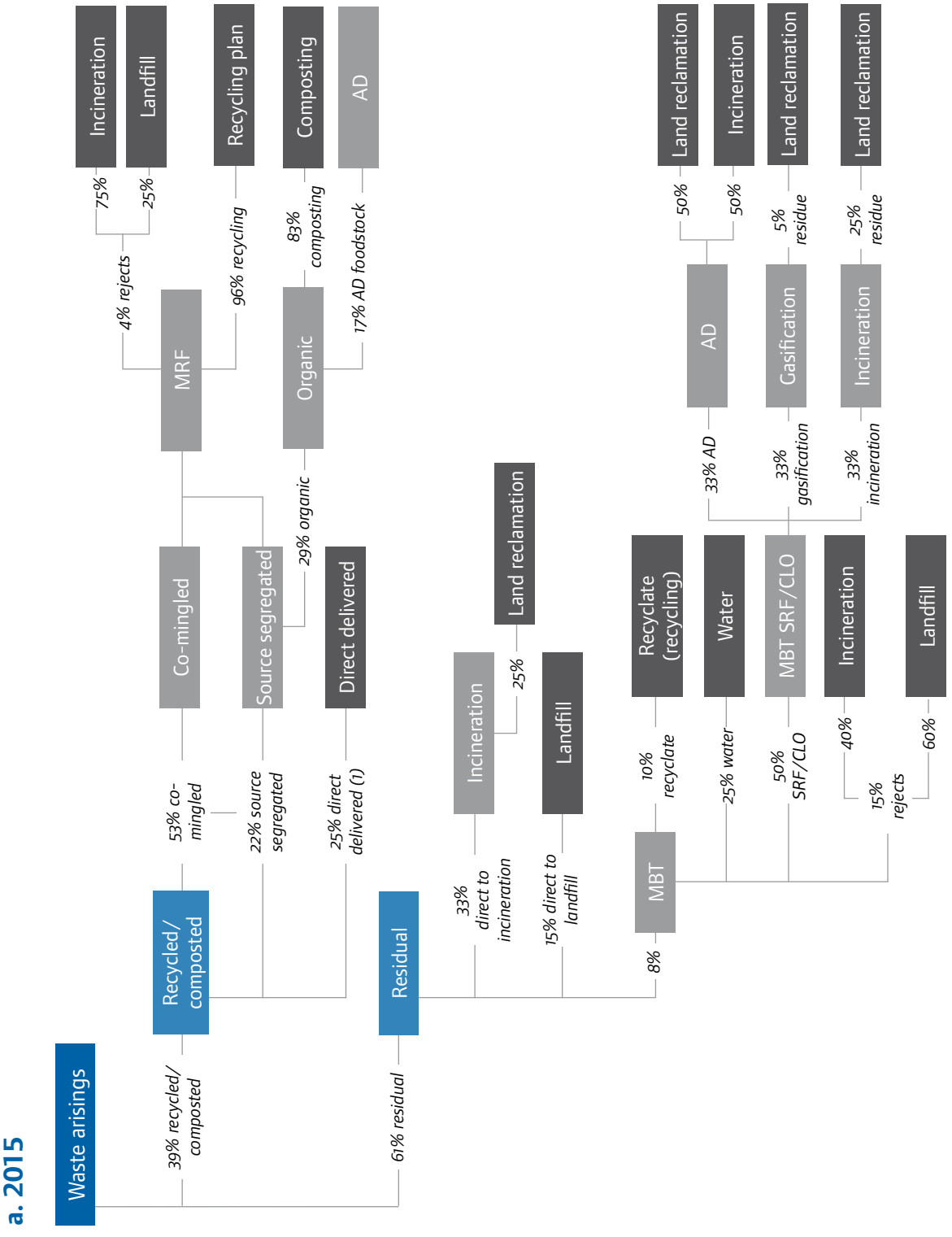
Figure 17: London's expected municipal waste recovery performance to 2031



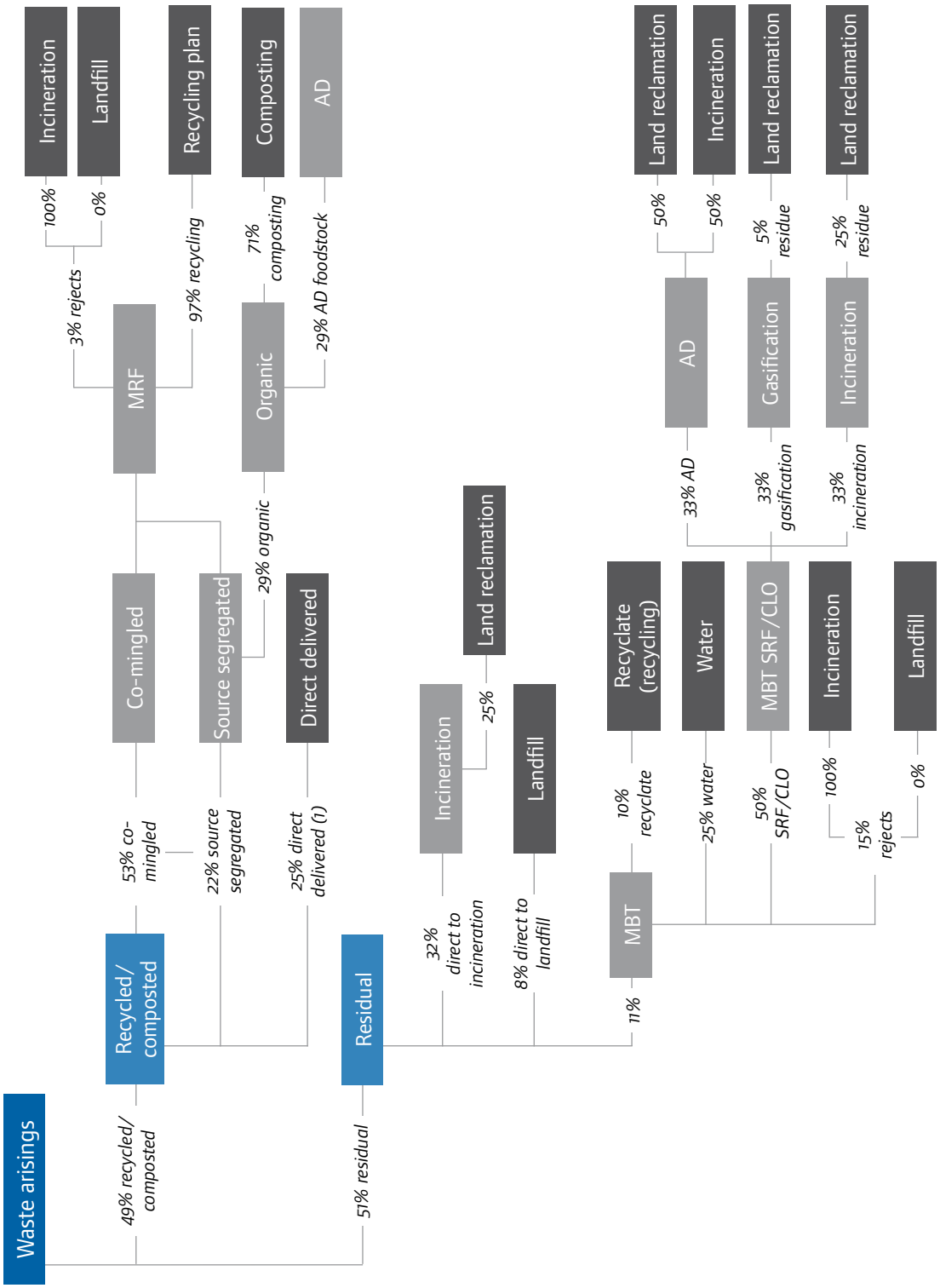
Note: The sharp decline in energy recovery levels from 2021 is a result of London's Edmonton incinerator closing in 2021 combined with an increase in reuse, recycling and composting performance

Appendix 3

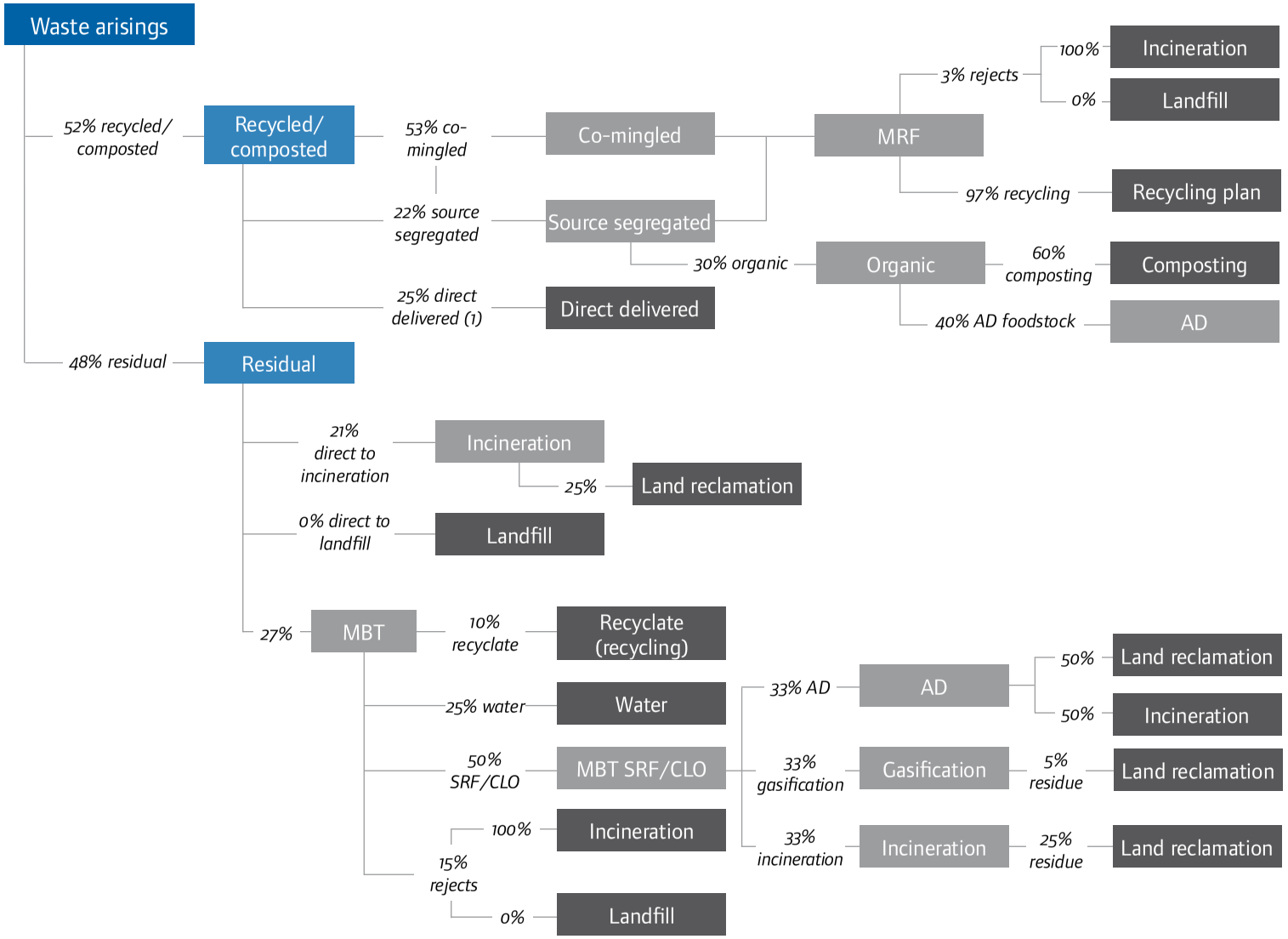
Modelled municipal waste flows in London



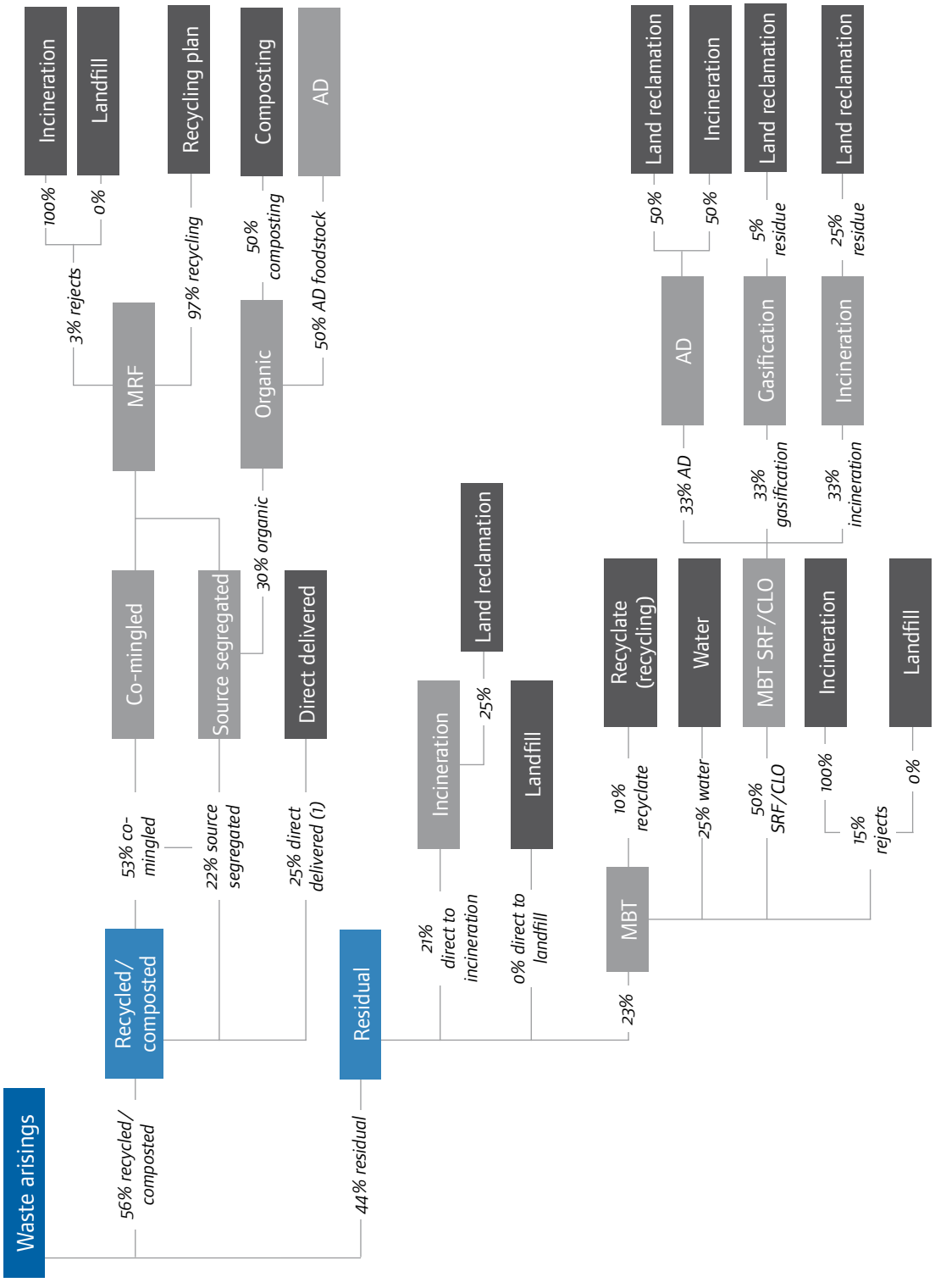
b. 2020


Waste arisings
49% recycled/ composted
Recycled/ composted
53% co-mingled
Co-mingled
MRF
100%
Incineration
0%
Landfill
3% rejects
97% recycling
Recycling plan
22% source segregated
Source segregated
29% organic
Organic
71% composting
Composting
29% AD foodstock
AD
25% direct delivered (i)
Direct delivered
51% residual
Residual
32% direct to incineration
Incineration
25%
Land reclamation
8% direct to landfill
Landfill
11%
MBT
10% recyclate
Recyclate (recycling)
25% water
Water
50% SRF/CLO
MBT SRF/CLO
100%
Incineration
15% rejects
0%
Landfill
33% AD
AD
50%
Land reclamation
50%
Incineration
33% gasification
Gasification
5% residue
Land reclamation
33% incineration
Incineration
25% residue
Land reclamation

c. 2025


Waste arisings
52% recycled/ composted
Recycled/ composted
53% co-mingled
Co-mingled
MRF
3% rejects
100%
Incineration
0%
Landfill
97% recycling
Recycling plan
22% source segregated
Source segregated
30% organic
Organic
60% composting
Composting
40% AD foodstock
AD
25% direct delivered (1)
Direct delivered
48% residual
Residual
21% direct to incineration
Incineration
25%
Land reclamation
0% direct to landfill
Landfill
27%
MBT
10% recyclate
Recyclate (recycling)
25% water
Water
50% SRF/CLO
MBT SRF/CLO
33% AD
AD
50%
Land reclamation
50%
Incineration
33% gasification
Gasification
5% residue
Land reclamation
33% incineration
Incineration
25% residue
Land reclamation
100%
Incineration
15% rejects
0%
Landfill

d. 2031


Waste arisings
56% recycled/ composted
Recycled/ composted
53% co-mingled
Co-mingled
MRF
3% rejects
100%
Incineration
0%
Landfill
97% recycling
Recycling plan
22% source segregated
Source segregated
30% organic
Organic
50% composting
Composting
50% AD foodstock
AD
25% direct delivered (1)
Direct delivered
44% residual
Residual
21% direct to incineration
Incineration
25%
Land reclamation
0% direct to landfill
Landfill
23%
MBT
10% recyclate
Recyclate (recycling)
25% water
Water
50% SRF/CLO
MBT SRF/CLO
100%
Incineration
15% rejects
Landfill
0%
33% AD
AD
50%
Land reclamation
50%
Incineration
33% gasification
Gasification
5% residue
Land reclamation
33% incineration
Incineration
25% residue
Land reclamation

Appendix 4

London waste authority recycling and composting collection services

The table below sets out the household and business recycling collection services offered by each of the 33 London boroughs.

Key:

WCA	Waste Collection Authority
WDA	Waste Disposal Authority
ELWA	East London Waste Authority
WLWA	West London Waste Authority
WRWA	Western Riverside Waste Authority

Note: Recycling collection services offered as of December 2009. Some services may have changed

Boroughs		Barking and Dagenham	Barnet	Bexley	Brent
Background information	Authority type	WCA	WCA	Unitary (waste) Authority	WCA
	Statutory Joint Waste Disposal Authority	ELWA	NLWA	n/a	WLWA
Kerbside recycling services					
Dry recycling	Collection System	Co-mingled	Kerbside sort	Kerbside sort	Kerbside sort
	Frequency of collection	Weekly, glass fortnightly	Weekly	Weekly	Weekly
	Containment	Orange sack	Blue and Black box	Three stacking boxes (green, maroon and black)	44 litre green box
Materials Collected	aerosols		*	* (maroon box)	*
	aluminium foil		*	* (maroon box)	*
	books			* (green box)	
	car batteries		*		*
	cardboard	* (thin card only)	*	* (green box)	
	drinks cartons	*			
	electrical items				
	glass bottles & jars	* (mixed, separate kerbside box)	*	* (black box)	*
	household batteries		*		*
	mixed cans	*	*	* (maroon box)	*
	mobile phones		*		
	motor oil		*		*
	paper	*	*	* (green box)	*
	plastic bags				
	plastic bottles	*	*	* (maroon box)	*
	shoes		*		*
	textiles		*		*
	yellow pages	*	*	* (green box)	*
	Number of materials collected	7	16	9	12

Boroughs		Bromley	Camden	City of London	City of Westminster
Background information	Authority type	Unitary (waste) Authority	WCA	Unitary (waste) Authority	Unitary (waste) Authority
	Statutory Joint Waste Disposal Authority	n/a	NLWA	n/a	n/a
Kerbside recycling services					
Dry recycling	Collection System	Kerbside sort	co-mingled	co-mingled	co-mingled
	Frequency of collection	Fortnightly	Weekly	Nightly Monday to Friday	Weekly
	Containment	Two boxes (green and black)	Green box and /or bag	Clear sacks	Box or blue sack
Materials Collected	aerosols	* (green box)	*	*	*
	aluminium foil	* (green box)			
	books	* (black box, paperback only)		*	
	car batteries				
	cardboard	* (black box)	*	*	*
	drinks cartons			*	
	electrical items				
	glass bottles & jars	* (green box)	*	*	*
	household batteries				
	mixed cans	* (green box)	*	*	*
	mobile phones				
	motor oil				
	paper	* (black box)	*	*	*
	plastic bags				
	plastic bottles	* (green box)	*	*	*
	shoes				
	textiles				
	yellow pages	*(black box)	*	*	*
	Number of materials collected	9	8	9	7

Boroughs		Croydon	Ealing	Enfield	Greenwich
Background information	Authority type	Unitary (waste) Authority	WCA	WCA	Unitary (waste) Authority
	Statutory Joint Waste Disposal Authority	n/a	WLWA	NLWA	n/a
Kerbside recycling services					
Dry recycling	Collection System	Co-mingled split bodied vehicle	Kerbside sort	Co-mingled	Co-mingled
	Frequency of collection	Fortnightly	Weekly	Weekly	Weekly
	Containment	Green box and Blue box	Green box	50 litre black box	240 litre blue topped wheeled bin or clear sacks
Materials Collected	aerosols	* (green box)	*	*	*
	aluminium foil		*		*
	books				
	car batteries		*		
	cardboard	* (blue box)	*	*	*
	drinks cartons		*	*	
	electrical items				
	glass bottles & jars	* (green box)	*	*	*
	household batteries		*		
	mixed cans	* (green box)	*	*	*
	mobile phones				
	motor oil		*		
	paper	* (blue box)	*(except wrapping paper)	*	*
	plastic bags		*		*
	plastic bottles	* (green box)	* all plastics except large items (ie garden furniture, toys and electrical items) polysterene and bubblewrap	*	*
	shoes	* (blue box)	*		
	textiles	* (blue box)	*		
	yellow pages	* (blue box)	*	*	*
	Number of materials collected	9	15	8	7

Boroughs		Hackney	Hammersmith and Fulham	Haringey	Harrow
Background information	Authority type	WCA	WCA	WCA	WCA
	Statutory Joint Waste Disposal Authority	NLWA	WRWA	NLWA	WLWA
Kerbside recycling services					
Dry recycling	Collection System	Kerbside sort	Co-mingled	Kerbside sort and co-mingled	Co-mingled
	Frequency of collection	Weekly	Weekly	Weekly	Fortnightly
	Containment	Green box, 55 litres, made from 100% recycled plastic	Orange 'Smart Sack'	Green box	Blue wheelie bin
Materials Collected	aerosols	*	*		*
	aluminium foil	*		*	*
	books				
	car batteries	*			
	cardboard	*	*	* (co-mingled only)	*
	drinks cartons		*	*	*
	electrical items				
	glass bottles & jars	*	*	*	*
	household batteries	*			
	mixed cans	*	*	*	*
	mobile phones			*	
	motor oil	*			
	paper	*	*	*	*
	plastic bags			*	
	plastic bottles	*	*	* (co-mingled only)	*
	shoes	*		* (co-mingled only)	
	textiles	*		* (kerbside sort only)	
	yellow pages	*	*	* (co-mingled only)	*
	Number of materials collected	13	8	8 (co-mingled) 9 (kerbside sort)	9

Boroughs		Havering	Hillingdon	Hounslow	Islington	Kensington and Chelsea
Background information	Authority type	WCA	WCA	WCA	WCA	WCA
	Statutory Joint Waste Disposal Authority	ELWA	WLWA	WLWA	NLWA	WRWA
Kerbside recycling services						
Dry recycling	Collection System	Co-mingled	Co-mingled	Kerbside sort	Co-mingled	Co-mingled
	Frequency of collection	Weekly	Weekly	Weekly	Weekly	Up to three times a week
	Containment	Orange survival sacks	Clear sacks	Green box	Green box	Orange bags
Materials Collected	aerosols		*	*	*	*
	aluminium foil			*	*	
	books		*			
	car batteries			*		
	cardboard	* (thin card)	*	*	*	*
	drinks cartons				*	*
	electrical items					
	glass bottles & jars		*	*	*	*
	household batteries			*		
	mixed cans	*	*	*	*	*
	mobile phones					
	motor oil			*		
	paper	*	*	* (seperately in blue paper bag)	*	*
	plastic bags				*	
	plastic bottles	*	*		*	*
	shoes			*		
	textiles			*		
	yellow pages		*	*	*	*
	Number of materials collected	4	8	12	10	8

Boroughs		Kingston upon Thames	Lambeth	Lewisham	Merton
Background information	Authority type	Unitary (waste) Authority	WCA	Unitary (waste) Authority	Unitary (waste) Authority
	Statutory Joint Waste Disposal Authority	n/a	WRWA	n/a	n/a
Kerbside recycling services					
Dry recycling	Collection System	Kerbside sort (main scheme and trial)	Co-mingled	Co-mingled	Kerbside sort (co-mingled)
	Frequency of collection	Fortnightly	Weekly	Weekly	Weekly
	Containment	Green box and bag for cardboard	Orange sack and / or green box	Green box or green lidded wheelie bin	Green and purple boxes
Materials Collected	aerosols		*		
	aluminium foil			* if clean	
	books				
	car batteries	*			
	cardboard	*	*	*	* (purple box)
	drinks cartons	*	*		* (purple box)
	electrical items				
	glass bottles & jars	*	*	*	* (green box)
	household batteries				
	mixed cans	*	*	*	* (purple box)
	mobile phones				
	motor oil				
	paper	* (not shredded)	*	*	* (green box)
	plastic bags				
	plastic bottles	*	*	*	* (purple box)
	shoes	*			
	textiles	*			
	yellow pages	*	*	*	* (purple box)
	Number of materials collected	10	8	7	7

Boroughs		Newham	Redbridge	Richmond upon Thames	Southwark
Background information	Authority type	WCA	WCA	WCA	Unitary (waste) Authority
	Statutory Joint Waste Disposal Authority	ELWA	ELWA	WLWA	n/a
Kerbside recycling services					
Dry recycling	Collection System	Co-mingled	Kerbside sort - partial	Kerbside sort	Kerbside sort, materials collected as three streams: paper and cardboard / glass / cans and mixed plastics
	Frequency of collection	Weekly	Weekly	Weekly	Weekly
	Containment	Orange sacks	Black box	Blue recycling box and Black recycling box	Reusable blue bag and blue box
Materials Collected	aerosols			*	* (blue box)
	aluminium foil			*	* (blue box)
	books			*	
	car batteries				
	cardboard	* (light)		*	* (blue bag)
	drinks cartons				
	electrical items				
	glass bottles & jars		*	*	* (blue box)
	household batteries				
	mixed cans	*	*	*	* (blue box)
	mobile phones				
	motor oil				
	paper	*	*	*	* (blue bag)
	plastic bags				
	plastic bottles	*	*	*	* (also food trays, margarine tubs and yoghurt pots, in blue box)
	shoes				
	textiles				
	yellow pages		*	*	* (Blue bag)
	Number of materials collected	4	5	9	8

Boroughs		Sutton	Tower Hamlets	Waltham Forest	Wandsworth
Background information	Authority type	Unitary (waste) Authority	Unitary (waste) Authority	WCA	WCA
	Statutory Joint Waste Disposal Authority	n/a	n/a	NLWA	WRWA
Kerbside recycling services					
Dry recycling	Collection System	Co-mingled (glass separate)	Co-mingled	Kerbside sort	Co-mingled
	Frequency of collection	Fortnightly	Weekly	Weekly	Weekly
	Containment	140l or 240l Green wheelie bin	Reusable sacks, disposable pink sacks, 140/240 litre wheeled bin, or clearly marked container	Black box	Orange sack
Materials Collected	aerosols	*	*		*
	aluminium foil			*	
	books				
	car batteries			*	
	cardboard	*	*	*	*
	drinks cartons		*		*
	electrical items				
	glass bottles & jars	*	*	*	*
	household batteries			*	
	mixed cans	*	*	*	*
	mobile phones				
	motor oil			*	
	paper	*	*	*	*
	plastic bags				
	plastic bottles	*	*	*	*
	shoes			*	
	textiles			*	
	yellow pages	*	*	*	
	Number of materials collected	7	8	12	7

Boroughs	Barking and Dagenham	Barnet	Bexley	Brent	Bromley	Camden	City of London
Kerbside organics							
Green garden waste collected separately	yes	no	yes (brown bin)	yes (240 litre green bin or bio-sack)	yes (charge of £1 per bag, must label seperately)	yes	no
Frequency of collection	Fortnightly	n/a		Fortnightly	Fortnightly	Request	n/a
Containment	Biodegradable green bags or wheeled bin	n/a	n/a	Biodegradable bags	Residents provide own bags to be labeled with stickers	Residents provide own bags	n/a
Food waste collected separately	trial	no	yes (brown bin)	no	trial (6 months began 17 Sept 07)	no	no
Frequency	Weekly	n/a		n/a	Weekly	n/a	n/a
Containment	Green bucket	n/a	n/a	n/a	Kitchen caddie / collection container	n/a	n/a
Green garden and food waste collected mixed	no	yes	yes	yes	no	yes	no

Boroughs	City of Westminster	Croydon	Ealing	Enfield	Greenwich	Hackney
Kerbside organics						
Green garden waste collected separately	yes	yes	yes	no	yes	yes
Frequency of collection	Alternate fortnights	Fortnightly between 31st March and 21st November	weekly - year round	no	weekly	Fortnightly
Containment	Reusable bag	Two reusable clear plastic sacks	New reusable pink sacks	no	green toped 240 litre bin	140 litre brown wheelie bin or compostable brown sacks for residents with limited road access.
Food waste collected separately	no	yes	yes	Yes	no	yes
Frequency	n/a	weekly	Weekly	Weekly	n/a	Weekly
Containment	n/a	Caddy	21 litre kitchen caddy	25 litre green box	n/a	7 litre blue kitchen caddy and a 20 litre lockable blue bin, recommened to buy compostable liners
Green garden and food waste collected mixed	no	no	no	yes	yes	no

Boroughs	Hammersmith and Fulham	Haringey	Harrow	Havering	Hillingdon	Hounslow	Islington
Kerbside organics							
Green garden waste collected separately	No	yes (kerbside sort only)	no	no	yes	yes	yes
Frequency of collection	weekly - with dry recylcing	weekly	n/a	n/a	Fortnightly	Weekly, same day as Green Box. Bags should be left out by 7am at the edge of the property.	Weekly
Containment	Sturdy refuse sacks	White reusable sack	n/a	n/a	Reusable canvas bags	Biodegradable sacks	Reuable bag
Food waste collected separately	no	no	no	no	no	no	yes
Frequency	n/a	n/a	n/a	n/a	n/a	n/a	Weekly
Containment	n/a	n/a	n/a	n/a	n/a	n/a	5 litre kitchen caddie with odour strips and brown kerbside container
Green garden and food waste collected mixed	no	yes	yes	no	no	no	no

Boroughs	Kensington and Chelsea	Kingston upon Thames	Lambeth	Lewisham	Merton	Newham
Kerbside organics						
Green garden waste collected separately	yes	yes	yes	no	yes	yes
Frequency of collection	Fortnightly (seasonal)	Weekly	On request		Request	Request
Containment	Reusable Garden Waste Sack	Reusable jute bag	Biodegradable sacks or reusable bag		Two clear reusable sack sacks	Residents provide own black bag or bundle the waste.
Food waste collected separately	no		no	no	yes	no
Frequency	n/a	Weekly	n/a	n/a	Weekly	n/a
Containment	n/a	5L kitchen caddie and 25L kerbside container	n/a	n/a	brown bin and kitchen bin	n/a
Green garden and food waste collected mixed	no	no	no	no	no	no

Boroughs	Redbridge	Richmond upon Thames	Southwark	Sutton	Tower Hamlets	Waltham Forest	Wandsworth
Kerbside organics							
Green garden waste collected separately	yes	yes	yes	yes (mentions that 18 Dec 2009 is last date but unsure if this is simply referring to last date of the year or end of scheme..)	yes	yes (includes food waste)	yes
Frequency of collection	On request	fortnightly	Fortnightly	Fortnightly	fortnightly	fortnightly	Request service
Containment	Sacks	Compostable sacks or wheelie bin	Single-use paper biodegradable bags, reusable jute bag, or brown wheeled bin	75l Green Garden Waste Sacks. £35 annual fee per bag (up to 3 bags). As of the 3rd November the service will be changing to a provision of two free reusable bags.	Reusable sack	Brown wheeled bin	Biodegradable sacks
Food waste collected separately	no	yes	no	no (subsidised composters available until 20 Dec 2009)	yes	no	no
Frequency	n/a	Weekly	n/a		weekly	n/a	n/a
Containment	n/a	5 litre kitchen caddy and 25 litre bin	n/a		23l collection caddy plus 5l kitchen caddy	n/a	n/a
Green garden and food waste collected mixed	no	no	no	no	no	yes	no

Boroughs	Barking and Dagenham	Barnet	Bexley	Brent	Bromley
Blocks of flats - dry recycling					
Bring system	yes	yes	yes	yes	yes
Type of collection system	Co-mingled	Source separated	Source separated	Source separated	Source separated
Containment	Orange recycling bank (1280 litre Eurobins) and orange sacks	Wheeled bins and reusable bags to store and transport material	Colour-coded 240-litre wheelie bins or 1100/ 1280-litre eurobins	5 240 litre wheeled bins fixed in a metal frame or set of 1,100 litre euro bins	Wheeled bins and reusable bag for storage
aerosols		*	* (white topped/ silver bin)	*	
aluminium foil		*	* (white topped/ silver bin)	*	
cardboard	* (thin card only)	*	* (blue bin)	*	*
drinks cartons					
glass bottles & jars		*	* (green bin)	*	*
household batteries					
mixed cans	*	*	* (white topped/ silver bin)	*	*
paper	*	*	* (blue bin)	*	*
plastic bottles	*	*	* (white topped/ silver bin)	*	*
shoes		*			
textiles		*			
yellow pages	*	*	* (blue bin)	*	*
Number of materials collected	5	10	8	8	6

Boroughs	Camden	City of London	City of Westminster	Croydon	Ealing
Blocks of flats - dry recycling					
Bring system	yes	yes	yes	yes	yes - Block of < 12 flats eligible for green box, garden waste and plastic collections. Block of 13–24 flats eligible for clear sack recycling (from Nov 2009). Block of > 25 eligible for communal recycling bins
Type of collection system	Separate and co-mingled	Private bring sites	Co-mingled	Comingled	Source separated
Containment	Either 1280 litre Eurobins or 360 litre wheeled bins. 2,000 households have reusable bag to store and transport materials in.	Clear sacks for households to deposit in refuse cupbaords, 240 or 1100 litre wheeled bins	Eurobin and polypropylene bags with handles	Euro or wheelie bins	Frame sets of 5 wheeled bins
aerosols	*	*	*	*	*
aluminium foil					
cardboard	*	*	*	*	*
drinks cartons		*			*
glass bottles & jars	*	*	*	*	*
household batteries					*
mixed cans	*	*	*	*	*
paper	*	*	*	*	*
plastic bottles	* (co-mingled only)	*	*	*	*
shoes					*
textiles					*
yellow pages	*	*	*	*	*
Number of materials collected	7	8	7	7	11

Boroughs	Enfield	Greenwich	Hackney	Hammersmith and Fulham	Haringey	Harrow	Havering
Blocks of flats - dry recycling							
Bring system	yes	yes	Split stream commingled	yes	yes	yes	Orange sacks collected in same way as refuse
Type of collection system	Co-mingled	Co-mingled	Commingled	Co-mingled	Source separated (street facing blocks) and co-mingled (housing estates)	co mingled	Co-mingled
Containment	1280 litre wheeled bins	1100 Eurobins (Blue Top)	Commingled with split stream for paper where space allows	"Smart Banks"	240 litre and 360 litre wheelie bins, 660 litre and 1100 litre Eurobins	blue wheeled bin	Orange sack taken to centralised bin
aerosols	*	*	*	*		*	
aluminium foil		*				*	
cardboard	*	*	*	*	* (co-mingled sites only)	*	* (thin card only)
drinks cartons	*			*	*	*	
glass bottles & jars	*	*	*	*	*	*	
household batteries							
mixed cans	*	*	*	*	*	*	*
paper	*	*	*	*	*	*	*
plastic bottles	*	*	*	*	* (co-mingled sites only)	*	*
shoes							
textiles				* (TRAID textile banks provided on some estates)			
yellow pages	*	*		*	* (some source separare sites only)	*	
Number of materials collected	8	8	6	9	4 (kerbside sort), 6 (co-minlged)	9	4

Boroughs	Harrow	Havering	Hillingdon	Hounslow	Islington	Kensington and Chelsea	Kingston upon Thames
Blocks of flats - dry recycling							
Bring system	yes	Orange sacks collected in same way as refuse	yes	yes	yes	yes	yes
Type of collection system	co mingled	Co-mingled	Co-mingled	Source separated	Co-mingled and source separated	Co-mingled	1,100 L bulk bin
Containment	blue wheeled bin	Orange sack taken to centralised bin	Bulk bin and clear sacks for storage	5 x 240 or 360 litre wheeled bins and 1100 litre cardboard bins (mini recycling sites), 1 x 526 litre 9 drawer system (hybrid sites)	288 mini recycling sites and 139 hybrid sites	1100 or 660 litre bin	
aerosols	*		*	*	*	*	
aluminium foil	*			*	*		
cardboard	*	* (thin card only)	*	*(estates trial- curently 112 sites)	*	*	*
drinks cartons	*				*	*	
glass bottles & jars	*		*	*	*	*	*
household batteries				* hybrid sites only			
mixed cans	*	*	*	*	*	*	
paper	*	*	*	*	*	*	*
plastic bottles	*	*	*		*	*	*
shoes				* hybrid sites only	*(hybrid sites only)		
textiles				* hybrid sites only	*(hybrid sites only)		
yellow pages	*		*	* hybrid sites only	*	*	
Number of materials collected	9	4	7	10	11	8	4

Boroughs	Lambeth	Lewisham	Merton	Newham	Redbridge	Richmond upon Thames	Southwark
Blocks of flats - dry recycling							
Bring system	yes	yes	yes	yes	yes	yes	yes
Type of collection system	Co-mingled	Separated paper and glass co-mingled plastic bottles and cans	Source separated		Glass, cans and plastic bottles (co-mingled) and paper (separate)	Source separate	Source separated
Containment	1280 litre Eurobins	1280, 1100 and 240 litre bins	2 bin system (glass source separate and paper, plastic bottles, card, cartons and cans co-mingled) 2 bins (1x 660 litre bin for co-mingled material and 1x 240 litre bin for glass)	Set of 3 x 1100 litre Eurobins	360, 660, or 1100 litre bins. With reusable bag for transportation.	7 x wheelie bins	Tailored to estate size, 240 litres, 330L, 660L or 1100L
aerosols	*					*	*
aluminium foil						*	*
cardboard	*	*	*	* (light)		*	*
drinks cartons	*		*				
glass bottles & jars	*	*	*		*	*	*
household batteries							
mixed cans	*	*	*	*	*	*	*
paper	*	*	*	*	*	*	*
plastic bottles	*	*	*	*	*	*	*
shoes							
textiles							
yellow pages	*	*	*		*	*	*
Number of materials collected	8	6	7	4	5	7	8

Boroughs	Sutton	Tower Hamlets	Waltham Forest	Wandsworth
Blocks of flats - dry recycling				
Bring system	yes	yes	yes	yes
Type of collection system		Co-mingled	Co-mingled	
Containment	Varies from site to site	Communal purple bins	1280 litre eurobin	Eurobins
aerosols	*	*	*	*
aluminium foil				
cardboard	*	*	*	*
drinks cartons		*		*
glass bottles & jars		*	*	*
household batteries				
mixed cans	*	*	*	*
paper	*	*	*	*
plastic bottles	*	*	*	*
shoes				
textiles				
yellow pages	*	*		
Number of materials collected	6	8	6	7

Boroughs	Barking and Dagenham	Barnet	Bexley	Brent	Bromley	Camden
Blocks of flats door to door collections						
	no	no	no	for those with access needs	no	none
Type of collection system	n/a	n/a	n/a	n/a	n/a	n/a
Frequency	n/a	n/a	n/a	n/a	n/a	n/a
Container type	n/a	n/a	n/a	n/a	n/a	n/a
Materials Collected						
aerosols	n/a	n/a	n/a	n/a	n/a	n/a
aluminium foil	n/a	n/a	n/a	n/a	n/a	n/a
cardboard	n/a	n/a	n/a	n/a	n/a	n/a
drinks cartons						n/a
glass bottles & jars	n/a	n/a	n/a	n/a	n/a	n/a
household batteries	n/a	n/a	n/a	n/a	n/a	n/a
mixed cans	n/a	n/a	n/a	n/a	n/a	n/a
paper	n/a	n/a	n/a	n/a	n/a	n/a
plastic bottles	n/a	n/a	n/a	n/a	n/a	n/a
shoes	n/a	n/a	n/a	n/a	n/a	n/a
textiles	n/a	n/a	n/a	n/a	n/a	n/a
yellow pages	n/a	n/a	n/a	n/a	n/a	n/a
Number of materials collected	n/a	n/a	n/a	n/a	n/a	0
Blocks of flats -food waste						
Type of collection system	Door to door	none	Some blocks have brown bins	none	none	none
Households served by the scheme	Marks Gate Estate	n/a	n/a	n/a	n/a	n/a
Frequency	Weekly	n/a	n/a	n/a	n/a	n/a
Container type	Kitchen caddy with biodegradable liners and EM Bokashi	n/a	140-litre brown bins	n/a	n/a	n/a
Other compostable material accepted	carboard	n/a	newspaper to wrap food waste	n/a	n/a	n/a

Boroughs	City of London	City of Westminster	Croydon	Ealing	Enfield	Greenwich
Blocks of flats door to door collections						
	yes	yes	no	no	no	no
Type of collection system	Co-mingled	Co-mingled	n/a	na	n/a	n/a
Frequency	At least twice weekly	Weekly	n/a	na	n/a	n/a
Container type	Clear sack	Basket and reusable bag	n/a	na	n/a	n/a
Materials Collected						
aerosols	*	*	n/a	na	n/a	n/a
aluminium foil			n/a	na	n/a	n/a
cardboard	*	*	n/a	na	n/a	n/a
drinks cartons	*					
glass bottles & jars	*	*	n/a	na	n/a	n/a
household batteries			n/a	na	n/a	n/a
mixed cans	*	*	n/a	na	n/a	n/a
paper	*	*	n/a	na	n/a	n/a
plastic bottles	*	*	n/a	na	n/a	n/a
shoes			n/a	na	n/a	n/a
textiles			n/a	na	n/a	n/a
yellow pages	*	*	n/a	na	n/a	n/a
Number of materials collected	8	7	n/a	na	n/a	n/a
Blocks of flats -food waste						
Type of collection system	Door to door	Near entry or waste storage area	none	none	none	none
Households served by the scheme	957 on 3 estates	605	n/a	na	n/a	n/a
Frequency	twice weekly	daily	n/a	na	n/a	n/a
Container type	Vented kichen caddy and liners	240L	n/a	na	n/a	n/a
Other compostable material accepted	Cut flowers and small pot plants. Food can be wrapped in newspaper	n/a	n/a	na	n/a	n/a

Boroughs	Hackney	Hammersmith and Fulham	Haringey	Harrow	Havering	Hillingdon	Hounslow
Blocks of flats door to door collections							
		no	yes (can't locate)	no	No	no	no
Type of collection system		n/a	Co-mingled	n/a		n/a	n/a
Frequency		n/a	Weekly	n/a		n/a	n/a
Container type		n/a	Reusable blue bag	n/a		n/a	n/a
Materials Collected							
aerosols		n/a		n/a		n/a	n/a
aluminium foil		n/a		n/a		n/a	n/a
cardboard		n/a	*	n/a		n/a	n/a
drinks cartons				n/a			
glass bottles & jars		n/a	*	n/a		n/a	n/a
household batteries		n/a		n/a		n/a	n/a
mixed cans		n/a	*	n/a		n/a	n/a
paper		n/a	*	n/a		n/a	n/a
plastic bottles		n/a	*	n/a		n/a	n/a
shoes		n/a		n/a		n/a	n/a
textiles		n/a		n/a		n/a	n/a
yellow pages		n/a	*	n/a		n/a	n/a
Number of materials collected	0	n/a	6	n/a	0	n/a	n/a
Blocks of flats -food waste							
Type of collection system	Bring down scheme	none	none	none	none	none	none
Households served by the scheme	5,000 - trial system	n/a	n/a	n/a	n/a	n/a	n/a
Frequency	Up to 3 times a week	n/a	n/a	n/a	n/a	n/a	n/a
Container type	7 litre kitchen caddy with biodegradable liners provided	n/a	n/a	n/a	n/a	n/a	n/a
Other compostable material accepted	no	n/a	n/a	n/a	n/a	n/a	n/a

Boroughs	Islington	Kensington and Chelsea	Kingston upon Thames	Lambeth	Lewisham	Merton	Newham
Blocks of flats door to door collections							
	yes	yes	yes	no	no	no	no
Type of collection system	Co-mingled	Co-mingled	Co-mingled with separate bag for glass		n/a	n/a	n/a
Frequency	Weekly	Weekly	Weekly		n/a	n/a	n/a
Container type	Reusable bag	Orange bags (provided free of charge)	Orange sack		n/a	n/a	n/a
Materials Collected							
aerosols	*	*			n/a	n/a	n/a
aluminium foil	*				n/a	n/a	n/a
cardboard	*	*			n/a	n/a	n/a
drinks cartons	*						
glass bottles & jars	*	*	*		n/a	n/a	n/a
household batteries					n/a	n/a	n/a
mixed cans	*	*	*		n/a	n/a	n/a
paper	*	*	*		n/a	n/a	n/a
plastic bottles	*	*	*		n/a	n/a	n/a
shoes					n/a	n/a	n/a
textiles					n/a	n/a	n/a
yellow pages	*	*			n/a	n/a	n/a
Number of materials collected	9	7	4	0	n/a	n/a	n/a
Blocks of flats -food waste							
Type of collection system	none	none	yes	Door to door	none	none	none
Households served by the scheme	n/a	n/a	6,000 flats	6000 - see comments below	n/a	n/a	n/a
Frequency	n/a	n/a	weekly	weekly	n/a	n/a	n/a
Container type	n/a	n/a	25 litre brown food waste bin with liner	kitchen caddy	n/a	n/a	n/a
Other compostable material accepted	n/a	n/a	no		n/a	n/a	n/a

Boroughs	Redbridge	Richmond upon Thames	Southwark	Sutton	Tower Hamlets	Waltham Forest	Wandsworth
Blocks of flats door to door collections							
	no	no	yes	no (trial textile collection being trialed)	yes	no	no
Type of collection system	n/a	n/a	Co-mingled	n/a	Co-mingled	n/a	n/a
Frequency	n/a	n/a	Weekly	n/a	Weekly	n/a	n/a
Container type	n/a	n/a	Clear bag	n/a	Green boxes, reusable sacks, disposable pink sacks, or plastic bags	n/a	n/a
Materials Collected							
aerosols	n/a	n/a	*	n/a	*	n/a	n/a
aluminium foil	n/a	n/a	*	n/a		n/a	n/a
cardboard	n/a	n/a	*	n/a	*	n/a	n/a
drinks cartons					*		
glass bottles & jars	n/a	n/a	*	n/a	*	n/a	n/a
household batteries	n/a	n/a		n/a		n/a	n/a
mixed cans	n/a	n/a	*	n/a	*	n/a	n/a
paper	n/a	n/a	*	n/a	*	n/a	n/a
plastic bottles	n/a	n/a	*	n/a	*	n/a	n/a
shoes	n/a	n/a		n/a		n/a	n/a
textiles	n/a	n/a		yes		n/a	n/a
yellow pages	n/a	n/a	*	n/a	*	n/a	n/a
Number of materials collected	n/a	n/a	8	n/a	8	n/a	n/a
Blocks of flats -food waste							
Type of collection system	none	none	none	none	door step collection or communal	Grange estate Leyton provided with door to door food waste collection.	none
Households served by the scheme	n/a	n/a	n/a	n/a	2, 000 & 5,000 (respectively)		n/a
Frequency	n/a	n/a	n/a	n/a	Weekly	Weekly	n/a
Container type	n/a	n/a	n/a	n/a	5l kitchen caddy & 23l collection caddy (doorstep) or 5l kitchen caddy & 240l brown composter bin (communal)	kitchen caddy with biode-gradable liners and EM Bokashi	n/a
Other compostable material accepted	n/a	n/a	n/a	n/a	n/a		n/a

Boroughs	Barking and Dagenham	Barnet	Bexley	Brent	Bromley	Camden	City of London	City of Westminster
Flats above shops - dry recycling								
Households served by the scheme			1,500 flats (some must use bring banks)				600 flats	All flats within next two years.
Type of collection system (co-mingled or kerbside sort)		kerbside sort	Separated into 3 bins or boxes				Co-mingled	Co-mingled
Frequency		weekly					Daily	Weekly
Containment		varies	3 kerbside collection boxes or 3 wheeled bins.				Clear sacks	Blue sacks (sometimes baskets), also communal eurobins and on street bring sites.
Materials Collected								
aerosols		*					*	*
aluminium foil		*						
cardboard		*	*				*	*
drinks cartons							*	
glass bottles & jars		*	*				*	*
household batteries		*						
mixed cans		*	*				*	*
paper		*	*				*	*
plastic bottles		*	*				*	*
shoes		*						
textiles		*						
yellow pages		*					*	*
No. of materials collected		11					8	7

Boroughs	Croydon	Ealing	Enfield	Greenwich	Hackney	Hammersmith and Fulham	Haringey	Harrow	Havering
Flats above shops - dry recycling									
Households served by the scheme	n/a	flats above shops eligible for mixed recycling from Nov 2009				2,500			
Type of collection system (co-mingled or kerbside sort)	n/a					Co-mingled sacks and bring sites			
Frequency	n/a					Weekly (10% of households receive twice weekly)			
Containment	n/a					Orange sacks			
Materials Collected									
aerosols	n/a	*							
aluminium foil	n/a								
cardboard	n/a	*							
drinks cartons	n/a								
glass bottles & jars	n/a	*							
household batteries	n/a								
mixed cans	n/a	*							
paper	n/a	*							
plastic bottles	n/a	*							
shoes	n/a								
textiles	n/a								
yellow pages	n/a	*							
No. of materials collected	n/a	7							

Boroughs	Hillingdon	Hounslow	Islington	Kensington and Chelsea	Kingston upon Thames	Lambeth	Lewisham	Merton
Flats above shops - dry recycling								
Households served by the scheme	2,000		2,500	All flats above shops				547 (This scheme will start in December 2008)
Type of collection system (co-mingled or kerbside sort)	Co-mingled		co-mingled	Co-mingled				Co-mingled
Frequency	Weekly		Nightly	Up to three times a week				Weekly/ Bi-weekly depending on the road
Containment	Clear bags		Clear plastic sacks	Orange sacks				Purple sack
Materials Collected								
aerosols	*		*					
aluminium foil			*					
cardboard	*		*					*
drinks cartons			*					*
glass bottles & jars	*		*					
household batteries								
mixed cans	*		*					*
paper	*		*					*
plastic bottles	*		*					*
shoes								
textiles								
yellow pages	*		*					*
No. of materials collected	7		9					6

Boroughs	Newham	Redbridge	Richmond upon Thames	Southwark	Sutton	Tower Hamlets	Waltham Forest	Wandsworth
Flats above shops - dry recycling								
Households served by the scheme	None		Trial has stopped for now; residents are asked to use the bring sites	On request			no	4,680 flats - can't
Type of collection system (co-mingled or kerbside sort)	n/a			Co-mingled sacks				Co-mingled sacks
Frequency	n/a			Weekly				Weekly
Containment	n/a			Clear Sacks				Orange sacks
Materials Collected								
aerosols	n/a			*				
aluminium foil	n/a			*				
cardboard	n/a			*				
drinks cartons	n/a							
glass bottles & jars	n/a			*				
household batteries	n/a							
mixed cans	n/a			*				
paper	n/a			*				
plastic bottles	n/a			*				
shoes	n/a							
textiles	n/a							
yellow pages	n/a			*				
No. of materials collected	n/a			8				

Boroughs	Barking and Dagenham	Barnet	Bexley	Brent	Bromley
Commercial waste recycling					
Commercial waste collection offered	yes	yes	yes	no	yes
Commercial recycling collection offered	no	no	yes	no	no
Number of businesses served	n/a	n/a	300 approximatly	n/a	n/a
Collection System	n/a	n/a	Source separate	n/a	n/a
Frequency of collection	n/a	n/a	Fortnighty	n/a	n/a
Containment	n/a	n/a	240 litre wheelie bins or 1100 litre Eurobins. Bulk containers (skips) may also be arranged for paper.	n/a	n/a
Promoted / subsidised	n/a	n/a	Subsidised by WRAP	n/a	n/a
Materials Accepted					
aerosols	n/a	n/a	*	n/a	n/a
aluminium foil	n/a	n/a	*	n/a	n/a
books	n/a	n/a	*	n/a	n/a
car batteries	n/a	n/a		n/a	n/a
cardboard	n/a	n/a	*	n/a	n/a
drinks cartons	n/a			n/a	n/a
electrical items	n/a	n/a		n/a	n/a
glass bottles & jars	n/a	n/a	*	n/a	n/a
household batteries	n/a	n/a		n/a	n/a
mixed cans	n/a	n/a	*	n/a	n/a
mobile phones	n/a	n/a		n/a	n/a
motor oil	n/a	n/a		n/a	n/a
paper	n/a	n/a	*	n/a	n/a
plastic bags	n/a	n/a		n/a	n/a
plastic bottles	n/a	n/a	*	n/a	n/a
shoes	n/a	n/a		n/a	n/a
textiles	n/a	n/a		n/a	n/a
yellow pages	n/a	n/a	*	n/a	n/a
Number of materials collected	n/a	n/a	9	n/a	n/a

Boroughs	Camden	City of London	City of Westminster	Croydon
Commercial waste recycling				
Commercial waste collection offered	yes	yes	yes	yes
Commercial recycling collection offered	yes	yes	yes	yes (paper, card and glass) and free used cooking ooil collection service, in partenrship with proper Oils
Number of businesses served		500+	Apx. 370	2,000
Collection System		Co-mingled	Separate	Mixed domestic and trade co-mingled
Frequency of collection	on request	Minimum once weekly to a daily	Various	Bespoke
Containment		Commercial recycling sack, 240 or 360 litre wheelie bin, 660 or 1100 litre Eurobin	Sacks and / or bins	1280 litre , 1100 litre, 660 litre, 360 litre, 240 litre bins
Promoted / subsidised		Promoted on website and commercial recycling leaflet	yes (baleing machines provided)	
Materials Accepted				
aerosols		*		
aluminium foil				
books		*		*
car batteries				
cardboard	*	*	*	*
drinks cartons		*		
electrical items				
glass bottles & jars	*	*	*	*
household batteries				
mixed cans	*	*	*	
mobile phones				
motor oil				
paper	*	*	*	*
plastic bags				
plastic bottles		*		
shoes				
textiles				
yellow pages		*	*	*
Number of materials collected	4	9	5	5

Boroughs	Ealing	Enfield	Greenwich	Hackney	Hammersmith and Fulham
Commercial waste recycling					
Commercial waste collection offered	yes	yes	yes	yes	yes
Commercial recycling collection offered	no	from selected businesses	yes (not sure?)	yes	yes
Number of businesses served	na			152	365
Collection System	na				Co-mingled
Frequency of collection	na	Weekly	Daily or as required	Variable	Depends on business
Containment	na		Trade recycling bags (50 = £75.20 100= £138.06)	240 litre wheeled bin to 1100 litre Eurobin	Smart sacks/ banks
Promoted / subsidised	na			Service is promoted via website, canvassing etc	20% discount on waste collection prices
Materials Accepted					
aerosols	na		*		*
aluminium foil	na		*		
books	na				
car batteries	na				
cardboard	na	*	*		*
drinks cartons					*
electrical items	na				
glass bottles & jars	na		*	*	*
household batteries	na				
mixed cans	na		*		*
mobile phones	na				
motor oil	na				
paper	na	*	*		*
plastic bags	na		*		
plastic bottles	na		*		*
shoes	na				
textiles	na				
yellow pages	na		*		*
Number of materials collected	na		8	1	7

Boroughs	Haringey	Harrow	Havering	Hillingdon	Hounslow
Commercial waste recycling					
Commercial waste collection offered	yes	There is a chargeable service for shops and offices. For further information call 0845 225 2600	yes	yes	yes
Commercial recycling collection offered	no	Yes - subject to a charge	yes - cardboard only	yes (? - can't locate)	yes
Number of businesses served	n/a		138	400	service available to all businesses in Hounslow borough upon request
Collection System	n/a		1100-litre wheeled bin and terracotta sacks		various
Frequency of collection	n/a	weekly	Weekly	Weekly	dependant on business- daily, weekly, fortnightly, etc...
Containment	n/a	wheeeled bins		1100 litre trade bins	Disposable plastic sack / wheeled refuse type bin
Promoted / subsidised	n/a	no	Not subsidised	Promoted	yes
Materials Accepted					
aerosols	n/a			*	
aluminium foil	n/a				
books	n/a			*	
car batteries	n/a				
cardboard	n/a	*	*	*	*
drinks cartons		*			
electrical items	n/a				
glass bottles & jars	n/a	*		*	
household batteries	n/a				
mixed cans	n/a	*		*	
mobile phones	n/a				
motor oil	n/a				
paper	n/a	*		*	*
plastic bags	n/a				
plastic bottles	n/a	*		*	
shoes	n/a				
textiles	n/a				
yellow pages	n/a	*		*	
Number of materials collected	n/a	7		8	2

Boroughs	Islington	Kensington and Chelsea	Kingston upon Thames	Lambeth
Commercial waste recycling				
Commercial waste collection offered	yes	yes	no	yes
Commercial recycling collection offered	Yes Islington council provide free Business Waste Minimisation Service to all businesses in the borough, including a free on-site waste audit and information pack.	yes	No	no
Number of businesses served	Approx 85		no	n/a
Collection System	Separate (glass) Cardboard & paper together	Co-mingled	n/a	n/a
Frequency of collection	3 times a week	As required	n/a	n/a
Containment	Sacks/ crates/tape	Sacks and bins (outside storage) cardboard office recycling box (indoor storage)	n/a	n/a
Promoted / subsidised	The cost to businesses per bag of glass/ cardbaord/paper is approximately 50% cheaper than the equivalent bag of general waste.	An estimated £500 could be saved a year by joining the scheme	n/a	n/a
Materials Accepted				
aerosols		*	n/a	
aluminium foil			n/a	
books			n/a	
car batteries			n/a	
cardboard	*	*	n/a	
drinks cartons		*	n/a	
electrical items			n/a	
glass bottles & jars	*	*	n/a	
household batteries			n/a	
mixed cans		*	n/a	
mobile phones			n/a	
motor oil			n/a	
paper	*	*	n/a	
plastic bags			n/a	
plastic bottles		*	n/a	
shoes			n/a	
textiles			n/a	
yellow pages		*	n/a	
Number of materials collected	3	7	n/a	

Boroughs	Lewisham	Merton	Newham	Redbridge	Richmond upon Thames
Commercial waste recycling					
Commercial waste collection offered	yes	yes	yes	yes	yes
Commercial recycling collection offered	yes (some businesses)	yes	no	no	yes
Number of businesses served		300 approximately	n/a	n/a	
Collection System	Source Separate		n/a	n/a	
Frequency of collection		Minimum of once weekly, maximum of thrice weekly	n/a	n/a	Tailored to suit individual businesses - operates 5 days per week
Containment	Various sizes	Bins (ranging from 240 to 1100 litre)	n/a	n/a	Tailored to suit individual businesses - operates 5 days per week
Promoted / subsidised		Promoted but not subsidised	n/a	n/a	n/a
Materials Accepted					
aerosols			n/a	n/a	
aluminium foil			n/a	n/a	
books			n/a	n/a	
car batteries			n/a	n/a	
cardboard	*	*	n/a	n/a	*
drinks cartons		*		n/a	
electrical items			n/a	n/a	
glass bottles & jars	*	*	n/a	n/a	*
household batteries			n/a	n/a	
mixed cans		*	n/a	n/a	
mobile phones			n/a	n/a	
motor oil			n/a	n/a	
paper		*	n/a	n/a	*
plastic bags			n/a	n/a	
plastic bottles		*	n/a	n/a	
shoes			n/a	n/a	
textiles			n/a	n/a	
yellow pages			n/a	n/a	
Number of materials collected		6	n/a	n/a	

Boroughs	Southwark	Sutton	Tower Hamlets	Waltham Forest	Wandsworth
Commercial waste recycling					
Commercial waste collection offered	no	yes	yes	yes	yes
Commercial recycling collection offered	no	yes	yes	no	yes
Number of businesses served		100			
Collection System			co-mingled		If requested
Frequency of collection			Varies		If requested
Containment			Sacks, wheeled, bulk		n/a
Promoted / subsidised			no		n/a
Materials Accepted					
aerosols			*		n/a
aluminium foil					n/a
books					n/a
car batteries					n/a
cardboard		*	*		n/a
drinks cartons					
electrical items					n/a
glass bottles & jars			*		n/a
household batteries					n/a
mixed cans			*		n/a
mobile phones					n/a
motor oil					n/a
paper		*	*		n/a
plastic bags					n/a
plastic bottles			*		n/a
shoes					n/a
textiles					n/a
yellow pages			*		n/a
Number of materials collected			7		n/a

Appendix 5

Summary of policies and proposals

Policy 1 – Informing producers and consumers of the value of reducing, reusing and recycling

Proposals

- The Mayor will set a London-wide household waste reduction target equating to 10 per cent per household by 2020 increasing to 20 per cent per household by 2031, based on 2008/09 household waste arisings.
- The Mayor will set a target to increase the amount of London's municipal waste that could be reused or repaired from 10,000 tonnes each year in 2008 to 40,000 tonnes a year in 2012 and 120,000 tonnes a year in 2031
- The Mayor will work with WRAP (Waste Resources Action Programme), London boroughs and the London Community Recycling Network to re-launch Recycle for London as a programme of waste reduction, reuse and recycling campaigns targeting both consumers and producers.
- The London Waste and Recycling Board has provisionally allocated roughly £8.5 million across the life of the board fund (2009 to 2012) to support reuse infrastructure.[1]
- The Mayor will work with London boroughs, the London Waste and Recycling Board and the London Community Recycling Network to develop a London Reuse Network, promoting waste reduction and reuse initiatives in the third sector, such as furniture reuse schemes, which can support existing local authority waste collection services.
- The Mayor, through Recycle for London, will promote Zero Waste Places projects in London as a means to showcase best practice and encourage London boroughs to participate in the scheme.
- The Mayor will work with businesses through the Mayor's Green Procurement Code and the Green 500 to agree a Charter on reducing municipal waste.
- The Mayor will identify leading businesses to work with the London Waste and Recycling Board as a network of mentors to small businesses wanting to improve resource efficiency and reduce waste.
- The Mayor will work with business to hold a packaging and product design competition aimed at "designing out" waste from the start.

Policy 2 – Setting a greenhouse gas standard for municipal waste management activities to reduce their impact on climate change

Proposals

- The Mayor will work with waste authorities to implement the Mayor's waste hierarchy in the development of municipal waste contracts and in waste management activities, to achieve the greatest possible greenhouse gas savings.
- The Mayor will work with the Environment Agency, waste authorities, and the waste industry to develop a consistent and comparable modeling approach to measuring the lifecycle greenhouse gas performance for managing London's municipal waste. The Mayor will consult on this modeling approach with wider stakeholders during the public consultation of his municipal waste management strategy in mid 2010.
- The Mayor will set a lifecycle greenhouse gas performance standard for the management of

London's municipal waste in agreement with the Environment Agency, waste authorities and in consultation with the waste industry. The Mayor will consult on this performance standard during the public consultation of the Mayor's municipal waste management strategy in mid 2010.

- The Mayor will work with waste authorities on independent research to update London's municipal waste composition data. This will ensure the most current waste data is used for setting a minimum lifecycle greenhouse gas performance standard.
- The Mayor will work with London's existing incineration operators to explore opportunities for using waste heat generated to improve the incinerators' overall efficiency and greenhouse gas performance.

Policy 3 – Capture the economic benefits of municipal waste management

Proposals

- The Mayor will work with London waste authorities on a best practice review of revenue-sharing opportunities in municipal waste management contracts.
- The Mayor will work with London Councils and Capital Ambition to investigate the opportunities for developing model municipal waste contracts that incorporate best practice and achieve tangible efficiency savings for waste authorities to use.
- Working with the boroughs, investigate the economics of co-mingled collection of recyclable waste (collecting all recyclables together) and kerbside sort (separating recyclable materials as they are collected), and a blend of the two, to determine the most cost-effective services, taking into account local considerations.
- Seek to provide investment, through the London Waste and Recycling Board, to help waste authorities and the private sector establish waste management facilities that achieve the greatest reductions in greenhouse gas emissions including through for reuse, upcycling[1] and closed loop recycling.
- Work with the London Waste and Recycling Board to help waste authorities that are interested in building and operating their own waste facilities to develop those facilities, particularly where they are able to work in partnership with other waste authorities.
- Work with waste authorities to tackle barriers that make it hard for the third sector to deliver local authority reuse and recycling services.
- Undertake more research into the costs of managing London's municipal waste through different mechanisms.

Policy 4 – London to achieve 45 per cent municipal waste recycling or composting performance (including anaerobic digestion[3]) by 2015, 50 per cent by 2020 and 60 per cent by 2031

Proposals

- The Mayor will undertake research, with waste authorities, on municipal waste recycling and composting performance across London, with the aim of showcasing good practice and identifying opportunities to deliver high quality and cost-effective collection services and achieve high rates of recycling or composting.
- The Mayor will work with boroughs and the London Waste and Recycling Board to help

boroughs provide recycling and composting collection services to small businesses comparable to those services provided to households.
- The Mayor will explore the potential with the London Waste and Recycling Board to fund infrastructure measures to encourage increase in recycling rates from flats, particularly in social housing.
- The Mayor will work with waste authorities to increase Londoner's use of local Reuse and Recycling Centres.
- The Mayor will work with waste authorities to provide positive incentives for Londoners to recycle and compost.
- The Mayor will work with waste authorities, the GLA group functional bodies, and the private sector to provide "on-the-go" recycling bins across London.
- The Mayor will work with waste authorities, using local media and marketing, to link local recycling and composting campaigns with regional initiatives through Recycle for London.

Policy 5 – Catalysing municipal waste infrastructure in London, particularly low-carbon technologies

Proposals

- The Mayor and the boroughs, through the London Waste and Recycling Board fund, will provide financial assistance for the provision of facilities for the collection, treatment or disposal of waste produced in London.
- The Mayor and the boroughs, through the board's brokerage service, will seek to involve external strategic partners who are able to make financial and in-kind investments to increase the value of the board's fund. This will be achieved through a number of mechanisms including the formation of joint ventures, where investors provide extra funding, and participation in other funding schemes such as EU match funding.
- The Mayor will call on the government to continue funding the board beyond 2012 when current funding is scheduled to cease.
- The Mayor, through the Board, will work with waste authorities and the private sector to develop new and existing waste facilities for reuse, recycling, composting and renewable energy in London.
- The Mayor, through the Mayor's Food to Fuel Alliance, will aim to deliver at least five exemplar food waste projects in London by 2012. The Food to Fuel Alliance will support food waste projects that generate renewable heat and power (including transport fuel), and compost material for local use.
- The Mayor will work with London's incinerator operators to examine the costs of making London's incinerators carbon neutral by using heat from the incineration process that is currently being wasted. The Mayor will examine the business case (including any state aid restraints) for an appropriate contribution to be made to these costs by such organisations as the London Waste and Recycling Board, the LDA and the Joint European Support for Sustainable Investment in City Areas (JESSICA) scheme.
- The Mayor, in reviewing municipal waste contracts and waste strategies, will work with waste authorities to intensify and re-orientate existing and planned waste sites in their control, to provide new facilities to

treat more of London's municipal waste in London wherever possible. This covers all aspects of development, from good design of sites through to the development of new waste treatment and energy recovery facilities.

- The Mayor, through the London Waste and Recycling Board, will work with waste authorities, landowners and other stakeholders to develop a waste site framework, which would set out opportunities for developing new waste infrastructure, looking at the most suitable sites and surrounding land uses; and linking where appropriate to the LDA's heat map network and www.londonbrownfieldsite.org.
- The Mayor will hold an open dialogue with local authority leaders to identify where the opportunities are for developing waste infrastructure in London. The Mayor will also actively explore opportunities to use LDA- and TFL-owned land for managing municipal waste.
- The Mayor, when reviewing municipal waste management contracts, will consider the impact contracts may have on the implementation of any of his other strategies, in particular the London Plan and his air quality, climate change adaptation and climate change mitigation and energy strategies.
- The Mayor, when reviewing municipal waste management contracts, will work with waste authorities to promote the most sustainable forms of transporting waste, maximising the potential use of rail and water transport.

Policy 6: Achieving a high level of street cleanliness

Proposals

- The Mayor will support and develop education campaigns that aim to change behaviour on littering and fly-tipping.
- The Mayor will write to government and request national funding for a behaviour change campaign on litter and chewing gum for London in the years leading up to 2012.
- The Mayor will work with local authorities to improve enforcement of environmental crimes including litter and graffiti.
- The Mayor will encourage boroughs to recycle or compost their street cleaning waste wherever practicable.
- The Mayor will work with a range of partners including London boroughs and the private sector to provide on-street recycling opportunities and to recycle waste from London's events.
- Support campaigns such as the Capital Clean-Up campaign that deliver and encourage wider involvement in such campaigns.
- Work with London Councils and the London boroughs to develop a road map towards a plastic-bag-free London.
- The Mayor will work with gum manufacturers and London boroughs to reduce the blight of chewing gum on London's streets by piloting biodegradable gum in London
- The Mayor will explore the opportunity of working with London boroughs, tobacco companies and tobacco retailers to develop a Londonwide smoking-related litter campaign.
- The Mayor will work with London Councils and the London boroughs to explore the opportunity for an online reporting and recording system for litter and fly-tipping.
- The Mayor will work with Transport for London and London Underground to empower Londoners and visitors to be more

responsible with their rubbish while on London's transport network.

Endnotes

1 Based on a provisional allocation as set out in the London Waste and Recycling Board 2009/10 Business Plan.

2 Upcycling – turning waste into materials or products of equal or greater quality

3 Where products from the anaerobic digestion process can be "used as a soil improver, as an ingredient in growing media or blended to produce a top soil that will meet British Standard BS 3882". Refer to National Indicator 192: Household waste recycled and composted.

Glossary of Terms

Advanced conversion technologies – are defined in the Reneables Obligation Order 2002 as meaning anaerobic digestion, gasification or pyrolysis. Such technologies may require pre–treatment technologies such as mechanical biological treatment (MBT) or autoclave to prepare waste for use in advanced conversion technologies.

Aggregates – granular material used in construction. Aggregates may be natural, artificial or recycled.

Anaerobic digestion – this is the biological degradation of organics in the absence of oxygen, producing biogas (typical composition of 65 per cent methane and 35 per cent CO_2) and residue (digestate) suitable for use as a soil improver.

Autoclave – is a steam sterilisation process to treat mixed waste and includes mechanical components to separate out materials suitable for recycling. The heat in the autoclave (up to 150 degrees Celsius) changes the physical characteristics of the waste. This can lead to greater recovery rates of higher quality recyclable materials than what can be achieved using mechanical biological treatment (MBT) technologies. Autoclave is also known as mechanical heat treatment (MHT).

Biodegradable waste – is defined in Council Directive 1999/31/EC on the landfill of waste as meaning any waste that is capable of undergoing anaerobic or aerobic decomposition, such as organic kitchen and green garden waste, and paper and paperboard. A proportion of textiles is deemed to be biodegradable for the purpose of implementing the Landfill Allowance Trading Scheme (LATS) – see definition.

Biomass – is defined in the Renewables Obligation Order 2002 as meaning fuel used in a generating station of which at least 98 per cent of the energy content (measured over a period of one month) is derived from plant or animal matter or substances derived directly or indirectly therefrom (whether or not such matter or substances are waste) and includes agricultural, forestry or wood wastes or residues, sewage and energy crops (provided that such plant or animal matter is not or is not derived directly or indirectly from fossil fuel).

Borough/London boroughs – There are 33 London boroughs administered by London Borough Councils which are elected every four years. The boroughs are the principal local authorities in London and are responsible for running most local services in their areas, such as schools, social services, waste collection and roads. Boroughs are also known as 'local authorities'.

Bottom Ash – burnt out residues from the bottom grate of waste incinerators, which represents between 20 and 25 percent of the processed waste by weight. Ferrous metals can be removed by magnetic separation for recycling and bottom ash itself is being increasing used in the manufacture of masonry blocks and in road construction.

Bring Recycling – refers to a recycling site, see recycling site. Known as such, as the recycler has to 'bring' their materials to the site.

Brownfield land – any land or premises which has previously been used or developed and is not currently fully in use, although it may be partially occupied or utilised. The land may also be vacant, derelict or contaminated but excludes parks, recreation grounds, allotments and land where the remains of previous use have blended into the landscape, or have been overtaken by nature conservation value or amenity use.

Business improvement districts – This concept was originally developed in the USA for increasing investment within defined areas of a city such as town centres. This is achieved through changes to local taxation, based on a supplementary rate levied on businesses within that defined area.

Capital Growth Programme – is designed to help Londoners creating 2,012 new food growing spaces by 2012. The programme providers practical advice and support to communities around London, helping people get access to land and create successful food growing spaces. Launched in November 2008, the programme is coordinated by London food link (part of Sustain – the alliance for better food and farming) and is funded by the Lottery and the Mayor of London.

Carbon dioxide – is a naturally occurring gas comprising 0.04 per cent of the atmosphere. It is essential to photosynthesis in plants and is also a prominent greenhouse gas. The burning of fossil fuels such as coal or gas, and some waste materials including plastics, releases carbon dioxide into the atmosphere. It is currently the predominant scientific opinion that carbon dioxide emissions are the main cause of global warming, contributing to climate change.

Carbon dioxide – equivalent – is the universal unit of measurement used to indicate the global warming potential (GWP) of greenhouse gases. It is used to evaluate the impacts of releasing (or avoiding the release of) different greenhouse gases. For example, the GWP of methane is 23 times that of CO_2, which has a GWP of 1. Sulphur hexafluoride has a GWP of 23,900. A CO_2–equivalent figure is used to represent the warming impact of greenhouse gases. See also definition of Global Warming Potential.

Combined heat and power – The combined production of electricity and usable heat is known as combined heat and power (CHP). Steam or hot water, which would otherwise be rejected when electricity alone is produced, is used for space or process heating.

Commercial waste – waste arising from premises which are wholly or mainly for trade, business, sport, recreation or entertainment as defined in Schedule 4 of the Controlled Waste Regulations 1992.

Co-mingled – Co-mingled Recycled materials that are collected together and are recycled following further sorting. Single stream co–mingled systems are where materials are collected in a single compartment vehicle with the sorting of the materials occurring at

a Materials Reclamation Facilities. Two stream partially co–mingled systems are where residents are required to separate materials into two categories, usually fibres (paper/card) and containers (glass, cans and plastic bottles). Separate containers are provided for each category the contents of which are loaded into separate compartments on a twin compartment collection vehicle.

Composting – this is the biological degradation of organic materials, such as garden and kitchen waste, in the presence of oxygen producing gas and residue suitable for use as a soil improver (see anaerobic digestion, central composting and home composting).

Construction, demolition & excavation waste – waste arising from the construction, repair, maintenance and demolition of buildings and structures, including roads. It consists mostly of brick, concrete, hardcore, subsoil and topsoil, but it can contain quantities of timber, metal, plastics and occasionally special (hazardous) waste materials.

Digestate – The nutrient–rich residues of anaerobic digestion that can be used as a soil improver or fertiliser

East London Waste Authority – Waste Disposal Authority for the London Boroughs of Newham, Redbridge, Barking and Dagenham and Havering.

Embodied carbon – The term "embodied carbon" refers to carbon dioxide emitted at all stages of a good's manufacturing process, from the mining of raw materials through the distribution process, to the final product provided to the consumer. Depending on the calculation, the term can also be used to include other green house gases.

Energy recovery – the recovery of useful energy in the form of heat and/or electric power from waste. Includes combined heat and power, combustion of landfill gas and gas produced during anaerobic digestion. Energy recovery technologies include mass burn incineration, incineration, gasification, pyrolysis, and anaerobic digestion.

Energy recovery from waste (EFW) – includes a number of established and emerging technologies, though most energy recovery is through incineration technologies. Many wastes are combustible, with relatively high calorific values – this energy can be recovered through (for instances) incineration with electricity generation.

Environmental Protection Act 1990 (EPA 1990) – a regulatory regime that came into force in 1990. It is designed to implement an approach to prevent harm to human health and the environment by ensuring an integrated (air, land and water) approach to environmental regulation and protection.

Fly tipping – the illegal deposit of waste on land.

Fuel cells – acts like a constantly recharging battery, electrochemically combining hydrogen and oxygen to generate power. For hydrogen

fuel cells, water and heat are the only by–products and there are no direct air pollution or noise emissions. They are suitable for a range of applications, including vehicles and buildings.

Functional Bodies – The Mayor has responsibility for appointing members to, and setting budgets for, four organsiations: Transport for London (TfL), London Development Agency (LDA), London Fire and Emergency Planning Authority (LFEPA), and Metropolitan Police Authority (MPA).

Gasification – is defined in the Renewables Obligation Order 2002 as meaning the substoichiometric oxidation or steam reformation of a substance to produce a gaseous mixture containing two or all of the following: oxides of carbon, methane and hydrogen.

Gate fee – or tipping fee is the charge levied upon a given quantity of waste received at a waste processing facility. In the case of a landfill it is generally levied to offset the cost of opening, maintaining and eventually closing the site. It may also include any landfill tax which is applicable in the region.

General conformity – The Greater London Authority Act was amended in 2007 and included changes governing waste. It requires waste authorities to notify the Mayor of new waste contracts before they are advertised and requires waste authorities to act in general conformity with the Mayor's Municipal Waste Management Strategy when undertaking their waste functions. The Mayor also has a power of direction under section 356 of the Greater London Authority Act, which he may use for the purposes of implementing his Municipal Waste Management Strategy.

Global Warming Potential (GWP) – Is a measure of how much a given mass of greenhouse gas is emitted to contribute to global warming. It is a relative scale which compare the gas in question to that of the same mass of carbon dioxide (whose GWP is by definition 1). Methane has a GWP of 23. A GWP is calculated over a specific time interval and the value of this must be stated whenever a GWP is quoted or else the value is meaningless.

Global warming – is the increase in the average temperature of the Earth's near–surface air and oceans since the mid–20th century and its projected continuation. Global surface temperature increased 0.74 ± 0.18 °C between the start and the end of the 20th century. The Intergovernmental Panel on Climate Change (IPCC) concludes that most of the observed temperature increase since the middle of the 20th century was caused by increasing concentrations of greenhouse gases resulting from human activity such as fossil fuel burning and deforestation, causing climate change.

Greater London – The geographical area encompassed by the 32 London boroughs and the City of London, representing most of the continuous built–up area of London and covering 1600 KM^2.

Greater London Authority – The organisation responsible for carrying out the functions set out in the Greater London

Authority Act, including the Mayor, Assembly and four functional bodies: the London Development Agency, Transport for London, the Metropolitan Police Authority and the London Fire and Emergency Planning Authority. There is a clear separation of powers within the GLA between the Mayor – who has an executive role, making decisions on behalf of the GLA – and the London Assembly, which has a scrutiny role.

Green 500 – is a carbon mentoring scheme initiated by the Mayor of London, aimed at large London organisations across private and public sectors. It is one of a number of LDA (London Development Agency) initiatives, which aims to help cut CO_2 emissions in the capital by 60% by 2025.

Greenhouse gases – Greenhouse gases are gases in an atmosphere that absorb and emit radiation within the thermal infrared range. Increased amounts of anthropogenic greenhouse gases (derived from human activities such as burning fossil fuels and raising farm stock) and deforestation are seen as the fundamental cause of the greenhouse effect causing climate change. The main greenhouse gases in the earth's atmosphere are water vapour, ozone, carbon dioxide, methane, and nitrous oxide. In addition to the main greenhouse gases, others include sulphur hexafluoride, hydrofluorocarbons and perfluorocarbons. Although these gases are less prevalent in the earth's atmosphere, they have very high global warming potential. Methane and carbon dioxide make up about 98 per cent of greenhouse gas emissions from waste activities.

Green industries – the business sector that produces goods or services which compared to other, generally more commonly used goods and services, are less harmful to the environment.

Gross Value Added – is the difference between output and intermediate (or average) consumption for any given sector/industry. That is the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production.

Household Waste – all waste collected by Waste Collection Authorities under section 45(1) of the Environmental Protection Act 1990, plus all waste arisings from Civic Amenity sites and waste collected by third parties for which collection or disposal credits are paid under Section 52 of the Environmental Protection Act 1990. Household waste includes waste from collection rounds of domestic properties (including separate rounds for the collection of recyclables), street cleansing and litter collection, bulky household waste collections, hazardous household waste collections, household clinical waste collections, garden waste collections, Civic Amenity/Reuse and Recycling Centre wastes, drop–off/'bring' systems, weekend skip services and any other household waste collected by the waste authorities. Household waste accounts for approximately four–fifths of London's municipal waste.

Home composting – compost can be made at home using a traditional compost heap, a purpose designed container, or a wormery.

Incineration – normally refers to the controlled burning of waste in the presence of sufficient air to achieve complete combustion. Energy is usually recovered in the form of electric power and/or heat. The emissions are controlled under EU Directive 2000/76/EC. This Directive also applies to other thermal treatment processes such as pyrolysis and gasification, so the term incineration may be applied to a wider range of thermal waste treatment processes. See also separate definitions of mass burn incineration, pyrolysis, and gasification.

Indirect to landfill – is defined as waste to landfill following some pre–treatment (such as mechanical biological treatment or autoclave) to remove any recyclable materials prior to landfill.

Industrial Waste – waste from any factory and any premises occupied by industry (excluding mines and quarries) as defined in Schedule 3 of the Controlled Waste Regulations 1992.

Inert waste – is defined in Council Directive 1999/31/EC on the landfill of waste as waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate must be insignificant, and in particular not endanger the quality of surface water and/or groundwater.

Integrated Waste Management – involves a number of key elements, including: recognising each step in the waste management process as part of a whole; involving all key players in the decision–making process and utilising a mixture of waste management options within the locally determined sustainable waste management system.

Joint European Support for Sustainable Investment in City Areas Scheme (JESSICA) – is an initiative of the European Commission in cooperation with the European Investment Bank and the Council of Europe Development Bank, in order to promote sustainable investment, and growth and jobs, in Europe's urban areas.

Kerbside Collection – any regular collection of recyclable from premises, which can include collections from commercial or industrial premises as well as households. Excludes collection services delivered on demand. Also see recycling collections from homes

Kerbside sort – systems are where materials are sorted by material type at the kerbside into different compartments of a collection vehicle.

Kilowatt – A unit of electrical power, equals 1,000 watts.

Landfill – sites are areas of land in which waste is deposited. Landfill sites are often located in disused quarries or mines. In areas where there are limited, or no ready–made voids, the practice of landraising is sometimes carried out, where some or all of the waste is deposited above ground, and the landscape is contoured.

Landfill Allowance Trading Scheme (LATS) – The government's key measure to meet the demands of the European Landfill Directive in England, and began on April 1, 2005. The system set allowances on the amount of biodegradable municipal waste local authorities can send to landfill. In two–tier areas, this refers to waste disposal authorities. These allowances are tradable, so that high landfilling authorities can buy more allowances if they expect to landfill more than the allowances they hold. Similarly, authorities with low landfill rates can sell their surplus allowances.

Landfill Tax – Landfill tax is paid on top of normal landfill fees by businesses and local authorities that want to dispose of waste using a landfill site. It is designed to encourage businesses to produce less waste and to use alternative forms of waste management. There are two rates of tax:

- the lower rate – £2.50 per tonne for inert waste such as rocks and soil and
- the standard rate – £40 per tonne from 1 April 2009 and increasing by £8 per tonne each year until at least 2013, when it will be £72 per tonne.

Land Use Planning – the Town and Country Planning system regulates the development and use of land in the public interest, and has an important role to play in achieving sustainable waste management.

Local authorities – see 'London boroughs/ boroughs'.

London Assembly – The directly–elected London regional body comprising 14 constituency members and 11 pan–London members. A component of the Greater London Authority.

London Waste and Recycling Board (LWARB) – was formally constituted in September 2008 with funding of £84 million from both central Government and the London Development Agency, with the objectives of using that fund in Greater London to promote and encourage the production of less waste, an increase in the proportion that is reused or recycled, and the use of methods of collection, treatment and disposal of waste that are more beneficial to the environment.

Lifecycle Assessment (LCA) – Life cycle assessment techniques measure the environmental and economic costs and benefits of products and activities (in this case waste) at every stage of its existence, from production to final disposal. Such techniques can provide a basis for making strategic decisions on the ways in which particular waste in a given set of circumstances can be most effectively managed, for example to reduce costs or greenhouse gas emissions from waste activities.

London Plan – see "Spatial Development Strategy".

Mass burn incineration/conventional incineration – is the controlled burning of waste in the presence of sufficient air to achieve complete combustion. Unsorted waste is fed onto a, usually inclined, grate and burnt as a

red–hot mass as it moves through the furnace. For this reason the process is also sometimes referred to as 'conventional incineration'. Plants are generally large–scale, having an annual capacity of 100,000 tonnes or more. The term 'mass burn incineration' is used in this strategy to refer specifically to this type of processes as distinct from other thermal treatment energy recovery processes such as pyrolysis, where air is absent, or gasification processes. See also separate definitions of incineration, pyrolysis, gasification, and Renewables Obligation Certificates.

Material Reclamation Facilities (MRFs) – a transfer station for the storage and segregation of recyclable materials. Also known as Material Recycling Facility or Material Recovery Facility.

Mayor's Green Procurement Code – The Mayor's Green Procurement Code was launched up in 2001 to support London's businesses and organisations to buy products made from recycled materials. Since its inception, the Mayor's Code aims to increase recycled content product procurement to stimulating the development of markets for recycled materials.

Mechanical Biological Treatment – systems consisting of a mechanical stage, where recyclables and rejects (batteries, tyres etc.) are separated to leave an organic fraction. This fraction is then sent, in the biological stage, for treatment using composting and digestion techniques. These systems provide a new generation of integrated waste management technology able to reduce landfill and mass burn incineration and to increase recycling and composting.

Methane – a greenhouse gas, 23 times stronger as a global warming gas than carbon dioxide. Methane is the predominant greenhouse gas from waste, mostly from biodegradable waste decomposing in landfill. Methane emissions from landfills make up approximately 40 per cent of UK greenhouse gas emissions.

Municipal Waste – see Municipal Solid Waste (MSW)

Municipal Solid Waste – this includes all waste under the control of local authorities or agents acting on their behalf. It includes all household waste, street litter, waste delivered to council recycling points, municipal parks and gardens wastes, council office waste, Civic Amenity waste, and some commercial waste from shops and smaller trading estates where local authorities have waste collection agreements in place. It can also include industrial waste collected by a waste collection authority with authorisation of the waste disposal authority.

Non–household municipal waste – refers to waste generated through local authority activities including waste from local authority premises, parks and gardens, and waste collected from businesses by local authorities. Non–household municipal waste makes up about 20 per cent of municipal waste.

North London Waste Authority – Waste Disposal Authority for the London Boroughs of Camden, Islington, Hackney, Waltham Forest, Haringey, Barnet and Enfield.

New and emerging technologies – technologies that are either still at a developmental stage or are recently operating at a commercial scale. May include new applications of existing technologies. In relation to waste, these include anaerobic digestion, mechanical biological treatment (MBT), autoclave, pyrolysis and gasification.

On–the go recycling – On the go' is a way for office workers, tourists and visitors in London can recycle as they move around the city by ensuring there are adequate numbers of easily accessible recycling bins strategically places across the city both on the streets, in public buildings, key venues and at work.

Organics waste – Organic waste consists of kitchen waste (e.g. potato peelings), waste food (e,g, leftovers, spoiled fruit and vegetables from markets), garden waste (e.g. grass clippings and hedge trimmings) and industrial waste (e.g. from agricultural and food processing factories).

Pre-treatment – for waste to be considered as pre–treated it must comply with the three–point test for the definition of "treatment". Treatment must be physical, thermal, chemical or biological process which can include sorting. These processes alter the characteristics of the waste and do so in order to reduce its volume; reduce its hazardous nature; facilitate its handling; or enhance its recovery. One of the simplest forms of pre–treatment for general waste is categorising a proportion of each waste stream and segregating it for recycling, which could be done either manually or at a sorting facility. Pre–treatment technologies include mechanical biological treatment and autoclave.

Prevention – The Waste and Resources Action Programme (WRAP), in developing their waste prevention toolkit, define waste prevention as 'minimising the quantity (weight and volume) and hazardousness of household–derived waste, generated in a defined community' Includes avoidance, reduction and reuse.

Proximity Principle – dealing with waste as near as practicable to its place of production.

Pyrolysis – is defined in the Renewables Obligation Order 2002 as meaning the thermal degradation of a substance in the absence of any oxidising agent (other than that which forms part of the substance itself) to produce char and one or both of gas and liquid.

Recovery – is defined in Waste Strategy 2007 as meaning obtaining value from waste through reuse; recycling; composting; other means of material recovery (such as anaerobic digestion); or energy recovery (combustion with direct or indirect use of the energy produced, manufacture of refuse derived fuel, gasification, pyrolysis and other technologies). In addition, certain operations are defined as recovery operations in Annex IIB of Council Directive 91/156/EEC of 18 March 1991 amending Directive 75/442/EEC on waste.

Recycling – involves the reprocessing of waste, either into the same product or a different one. Many non–hazardous industrial wastes such as paper, glass, cardboard, plastics and scrap metals can be recycled. Special wastes such as solvents can also be recycled by specialist companies, or by in–house equipment.

Recycling Site – a group of containers for the collection of a variety of materials for recycling. Often located in supermarket or public building car parks or on street corners. Commonly referred to as 'bottle banks' but usually collecting a variety of materials. Also see bring site.

Reduction – achieving as much waste reduction as possible is a priority action. Reduction can be accomplished within a manufacturing process involving the review of production processes to optimise utilisation of raw (and secondary) materials and recirculation processes. It can be cost effective, both in terms of lower disposal costs, reduced demand for raw materials and energy costs. It can be carried out by householders through actions such as home composting, reusing products and buying goods with reduced packaging.

Regional self–sufficiency – Dealing with wastes within the region where they arise. Waste regional self–sufficiency is dealt with in more detail in the London Plan: 'The Mayor's Spatial Development Plan for London'.

Renewable Obligation Certificates – are certificates issued when electricity is generated from renewable sources. The Electricity Act 1989 requires electricity suppliers to meet a certain percentage of their total sales from renewable sources. Under the Renewable Obligation Order 2002, only plants that generate electricity from biomass will be eligible although the biomass may be a waste. Plants processing wastes must, however, use advanced conversion technologies in order to be eligible, and it is only the biomass component of the waste that will earn Renewable Obligation Certificates or ROCs. Advanced conversion technologies are defined in the Order as anaerobic digestion, gasification and pyrolysis.

Residual or "black bag" waste – Residual waste is that portion of the waste stream collected by local authorities which is not re–used, recycled or composted and remains to be treated through the recovery of energy and/or materials or through disposal to landfill.

Residues – are secondary waste materials requiring further treatment or disposal following a waste recycling, composting or treatment process. For example, bottom ash following the incineration of waste or contaminated recyclable material from a Material Reclamation Facility.

Reuse – can be practised by the commercial sector with the use of products designed to be used a number of times, such as reusable packaging. Householders can purchase products that use refillable containers, or reuse plastic bags. The processes contribute to sustainable development and can save raw materials, energy and transport costs.

Reuse and Recycling Centres (RRCs) – sites operated by local authorities where residents and local businesses can take their waste for reuse, recycling and disposal. RRCs are sometimes also referred to as Civic Amenity sites

Revenue-sharing contract – contractual arrangement where income generated from sale of waste materials and products (including recyclable products and energy generated from waste) is shared between both local authority and waste contractor.

Social housing – is an umbrella term referring to rental housing which may be owned and managed by the state, by not–for–profit organisations, or by a combination of the two, usually with the aim of providing affordable housing.

Source-separate collection – recycling collection schemes from homes or businesses where materials for recycling are collected separately from other materials, either by different vehicle or at a different time to the ordinary household or business waste collection.

South East Region – the South East Region runs in an arc around London from Kent at the South East extremity along the coast to Hampshire, Southampton and Portsmouth in the South West, and then to Milton Keynes and Buckinghamshire in the North. In total it encompasses 19 counties and unitary authorities and 55 district authorities.

Spatial Development Strategy – the Mayor is required by law (under the Greater London Authority Act 1999) to produce a spatial development strategy for London, known as 'the London Plan'. London boroughs in developing their local development documents have to be in "general conformity" with the London Plan.

Third sector – Description for voluntary or not–for–profit organisations, charities, and social enterprises.

Transport for London (TfL) – a functional body of the Greater London Authority, accountable to the Mayor for implementing his Transport Strategy, with responsibility for the operation of buses, the Docklands Light Railway, Croydon Tramlink, and in due course the Underground, and for regulating taxis and private hire vehicles, and operation of the Transport for London Road Network.

Treatment – involves the chemical or biological processing of certain types of waste for the purposes of rendering them harmless, reducing volumes before landfilling, or recycling certain wastes.

Unitary authority – a local authority, which has the responsibilities of both Waste Collection and Waste Disposal Authorities.

Virgin materials – virgin materials are natural and have not previously been used (for example (natural) wood, coal, gas or oil).

Waste – the strict legal definition of waste is extremely complex but it encompasses most unwanted material which has fallen out of the commercial cycle or chain of utility, which

the holder discards, or intends to, or is required to discard.

Waste Arising – the amount of waste generated in a given locality over a given period of time.

Waste authority – for the purpose of this strategy, the term waste authority is a collective term to include London unitary, collection, and waste disposal authorities.

Waste Collection Authority (WCA) – the authority responsible for arranging the collection of household waste in their area (in London this is on a borough–wide basis) and commercial or industrial waste on request.

Waste Disposal – this is defined by the list of operations that constitute disposal (for under Part III of Schedule 4 of the Waste Management Licensing Regulations). This includes landfill, land raising, incineration, permanent storage etc.

Waste Disposal Authorities (WDAs) – the Authority responsible for arranging for the disposal of waste collected in their area by the Waste Collection Authority. They also provide sites where householders can deposit waste free of charge (Re–use and Recycling Centres).

Western Riverside Waste Authority – Waste Disposal Authority for the Royal Borough of Kensington and Chelsea, The London boroughs of Hammersmith and Fulham, Wandsworth and Lambeth.

West London Waste Authority – Waste Disposal Authority for the London Boroughs of Richmond upon Thames, Hounslow, Ealing, Brent, Harrow and Hillingdon.

Waste Hierarchy – suggests that: the most effective environmental solution may often be to prevent or reduce the amount of waste generated; where further reduction is not practicable, products and materials can sometimes be used again, either for the same or a different purpose – reuse; failing that, value should be recovered from waste, through recycling, composting or energy recovery from waste; only if none of the above offer an appropriate solution should waste be disposed.

Waste Management Industry – the businesses (and not–for–profit organisations) involved in the collection, management and disposal of waste.

Waste Transfer Station – a site to which waste is delivered for sorting prior to transfer to another place for recycling, treatment or disposal.

World City – a globally successful location for a range of functions, particularly business, culture and tourism, and headquarters and government functions; currently applying to only a small number of the world's great cities – London, New York, Paris and Tokyo.

Zero waste – Waste Strategy 2007 defines zero waste as "A simple way of encapsulating the aim to go as far as possible in reducing the environmental impact of waste." It is a visionary goal which seeks to prevent waste occurring, conserves resources and recovers all value from materials".

Abbreviations

AD	Anaerobic digestion
BIDs	Business Improvement Districts
BMW	Biodegradable Municipal Waste
BREW	Business Resource Efficiency and Waste
C&I	Commercial & industrial waste
CHP	Combined Heat and Power
CDEW	Construction, demolition & excavation waste
CFWR's	Committed Food Waste Reducer's
CLO	Compost-like output
CO_2	Carbon dioxide
CO_2 eq	Carbon dioxide – equivalent
DEFRA	Department for the Environment Food and Rural Affairs
EA	Environment Agency
ELWA	East London Waste Authority
EU	European Union
FRN	Furniture Reuse Network
GHG	Green house gas
GLA	Greater London Authority
GLC	Greater London Council
GVA	Gross Value Added
Hhld	Households
JESSICA	Joint European Support for Sustainable Investment in City Areas scheme
Kg	Kilograms
KWh	Kilo Watt Hour
LA	Local Authorities
LATS	Landfill Allowance Trading Scheme
LC	London Councils
LCRN	London Community Recycling Network
LDA	London Development Agency
LESS	London Environmental Support Service
LRN	London Reuse Network
LWARB	London Waste and Recycling Board
MBT	Mechanical biological treatment

MGPC	Mayor of London's Green Procurement Code
MRF's	Materials Reclamation Facilities
MSW	Municipal Solid Waste
NI	National Indicators
NLWA	North London Waste Authority
PPS10	Planning Policy Statement 10
RFL	Recycle for London
ROCs	Renewable Obligation Certificates
SELCHP	South East London Combined Heat and Power
SLWP	South London Waste Partnership
SME	Small to medium sized enterprise
TFL	Transport for London
UA	Unitary Authority
UK	United Kingdom
WDA	Waste Disposal Authority
WLWA	West London Waste Authority
WRAP	Waste Resources Action Programme
WRATE	Waste and Resources Assessment Tool for the Environment
WRWA	Western Riverside waste Authority

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Chinese

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Hindi

यदि आप इस दस्तावेज की प्रति अपनी भाषा में चाहते हैं, तो कृपया निम्नलिखित नंबर पर फोन करें अथवा नीचे दिये गये पते पर संपर्क करें

Vietnamese

Nếu bạn muốn có văn bản tài liệu này bằng ngôn ngữ của mình, hãy liên hệ theo số điện thoại hoặc địa chỉ dưới đây.

Bengali

আপনি যদি আপনার ভাষায় এই দলিলের প্রতিলিপি (কপি) চান, তা হলে নীচের ফোন্ নম্বরে বা ঠিকানায় অনুগ্রহ করে যোগাযোগ করুন।

Greek

Αν θέλετε να αποκτήσετε αντίγραφο του παρόντος εγγράφου στη δική σας γλώσσα, παρακαλείστε να επικοινωνήσετε τηλεφωνικά στον αριθμό αυτό ή ταχυδρομικά στην παρακάτω διεύθυνση.

Urdu

اگر آپ اِس دستاویز کی نقل اپنی زبان میں چاھتے ھیں، تو براہ کرم نیچے دئے گئے نمبر پر فون کریں یا دیئے گئے پتے پر رابطہ کریں

Turkish

Bu belgenin kendi dilinizde hazırlanmış bir nüshasını edinmek için, lütfen aşağıdaki telefon numarasını arayınız veya adrese başvurunuz.

Arabic

إذا أردت نسخة من هذه الوثيقة بلغتك، يرجى الاتصال برقم الهاتف أو مراسلة العنوان أدناه

Punjabi

ਜੇ ਤੁਹਾਨੂੰ ਇਸ ਦਸਤਾਵੇਜ਼ ਦੀ ਕਾਪੀ ਤੁਹਾਡੀ ਆਪਣੀ ਭਾਸ਼ਾ ਵਿਚ ਚਾਹੀਦੀ ਹੈ, ਤਾਂ ਹੇਠ ਲਿਖੇ ਨੰਬਰ 'ਤੇ ਫ਼ੋਨ ਕਰੋ ਜਾਂ ਹੇਠ ਲਿਖੇ ਪਤੇ 'ਤੇ ਰਾਬਤਾ ਕਰੋ:

Gujarati

જો તમને આ દસ્તાવેજની નકલ તમારી ભાષામાં જોઈતી હોય તો, કૃપા કરી આપેલ નંબર ઉપર ફોન કરો અથવા નીચેના સરનામે સંપર્ક સાધો.

GREATER**LONDON**AUTHORITY