September 2008

# Briefing

Friends of the Earth

# Recycling

## Why it's important and how to do it

## Introduction

Recycling saves energy, reduces raw material extraction and combats climate change. The vast majority of studies have found that recycling our rubbish is better for the environment rather than incinerating or landfilling it.

Friends of the Earth has long campaigned for increased recycling and more recently for law requiring better doorstep recycling collections. Most households now have kerbside collections of recycling and the number of different materials accepted is increasing. However there is still a big potential for councils to improve collection schemes and maximise the benefits recycling offers us, by implementing the best practice outlined in this briefing.



**Friends of the Earth, 26-28 Underwood Street, London N1 7JQ**
**Tel: 020 7490 1555 Fax: 020 7490 0881 Email: info@foe.co.uk Website: www.foe.co.uk**

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### Moving away from landfill

Most of the UK's waste is currently buried in landfill sites, which release climate change gases and pollute the soil and water. EU law means we have to dramatically reduce the amount of biodegradable waste we landfill.

Councils must meet targets for reducing the amount of biodegradable waste they send to landfill or they face big fines under the Landfill Allowance Trading Scheme (LATS). In the face of LATS and increasing landfill prices, councils are scrambling to find alternative ways to deal with our rubbish, such as incineration.

However, the most effective and sustainable way councils can divert waste from landfill is to implement a really effective kerbside recycling and composting collection scheme.

### Maximising recycling

Doorstep services are improving, but there is still a long way to go before all local authorities have a doorstep collection scheme that could be considered good practice.

In 2006/07 the UK recycled 27 per cent of its municipal rubbish. Some local authorities are recycling nearly double this average, for example Rushcliffe Borough Council recycles over half their municipal waste. Other European countries such as Austria, the Netherlands and Germany recycle around half of their waste, whilst Flanders in Northern Belgium recycles over 70 per cent of its municipal waste.

In light of these examples, the recycling targets set in the new Waste Strategy for England are disappointing. It sets unambitious recycling and composting rates of 40 per cent by 2010, 45 per cent by 2015 and 50 per cent by 2020. However, the target for 2020 will be reviewed in 2010 to see if it could be more ambitious. By implementing the best practice outlined in this briefing, councils can improve their recycling rates so that the average rate exceeds the target of 40 per cent recycling by 2010, which will demonstrate to the government that we can aim even higher in the future and catch up with the rest of Europe.

## Why recycle?

### Recycling saves raw materials

Recycling reduces the need for raw materials such as metals, forests and oil and so reduces our impact on the environment. The level of our consumption in the UK is already having a significant impact on the environment and communities across the world, and we're consuming an increasing quantity of raw materials.

Extracting virgin materials is a key cause of global habitat loss. For example, demand for paper and cardboard is threatening ancient woodlands. Virgin materials need to be refined and processed to create products, requiring vast amounts of energy and the use of polluting chemicals further causing the destruction of habitats. For example, making one tonne of aluminium needs 4 tonnes of chemicals and 8 tonnes of bauxite (the mineral ore), and it takes 95 per cent less energy[1] to make a recycled aluminium can than it does to make one from virgin materials. On top of materials needed, the creation of waste slag and the large areas of land

required for industrial smelting cause considerable environmental problems.

## Recycling reduces our impact on climate change

Although recycling uses energy, overall it reduces climate emissions, as recycling a material generally uses far less energy than manufacturing from virgin materials.[2,3]

This conclusion is confirmed by many studies, including a recent study done for the Government by the consultants ERM,[2] and a study carried out for the government-funded Waste and Resources Action Programme (WRAP).[3] The WRAP study assessed the relative greenhouse gas savings associated with current UK levels of recycling for paper/cardboard, glass, plastics, aluminium and steel, and concluded:

"The UK's current recycling of those materials saves between 10-15 million tonnes of $CO_2$ equivalents per year compared to applying the current mix of landfill and incineration with energy recovery to the same materials. This is equivalent to about 10 per cent of the annual $CO_2$ emissions from the transport sector, and equates to taking 3.5 million cars off UK roads."

For example, if you recycle waste paper you save three times as much energy as is produced by burning it to produce energy.[3] Recycling plastic saves five times the energy created by burning it.

## Recycling costs less

The costs of different waste management techniques are subject to many variables making it difficult to distinguish between them in purely economic terms. However, when comparing landfill, incineration and recycling, recycling has considerable economic merit.[4]

Recycling instead of sending waste to landfill avoids the payment of landfill tax and potential LATS fines. Incineration is expensive - it is not a low cost alternative for meeting LATS targets.[5]

## Recycling generates cash

After collection, recyclables are separated and baled at materials recycling facilities (MRFs) and sent to reprocessors such as paper mills, glass works or plastic reprocessing plants where the waste is processed for use in new products. Although it costs local authorities money to collect recycling, the materials generate income when recycled and sold. This money can be fed back into the waste collection budget.

## Recycling creates jobs

The process of recycling and composting, from kerbside collection to the sorting and reprocessing of recyclables, creates more jobs than incineration and landfill.[6] There is still a huge potential for growth in the reprocessing sector, particularly in areas with strong manufacturing industry.

Studies have estimated (conservatively) that for every tonne recycled 5.9 jobs are created.[7] This figure doesn't include supplementary jobs also created down the line, which have been estimated as one additional job for every position created at the reprocessing stage.[8] It has also been suggested that recycling newspapers creates three times as many jobs as incinerating

them [9] and 9 new jobs could be created per 1000 tonnes recycled in kerbside collection and sorting schemes.[10]

### Recycling helps us toward sustainable living

For householders, recycling is one of the easiest ways they can reduce their impact on the environment and it is often the first such action they take. It introduces a "green" consciousness to daily life. Making people think about the impact of their consumption and production of waste can help to encourage us to make lifestyle decisions to reduce the waste we create and our impact on the environment. Recycling also creates a cyclic way of living rather than the current linear model, and this change is essential for reducing our impact on the environment as a whole, and will help us develop sustainably.

## Best practice recycling

Friends of the Earth campaigned for better doorstep recycling services through drafting and supporting the Household Waste Recycling Bill. This Bill was sponsored by Joan Ruddock MP (since summer 2007, the Minister responsible for waste) and was finally made an Act in November 2003. The Act requires all local authorities in England to collect at least two types of recyclable waste from all households in their area by the end of 2010.

About nine out of ten households are now served by kerbside recycling collection schemes.[11]

In 2005/06, 56 per cent of household waste recycled was collected through such schemes and 43 per cent of the household waste recycled was collected from bring banks/ recycling collection points and civic amenity sites.[12]

An effective doorstep collection scheme should:

- produce **high quality materials** for recycling and composting
- encourage high rates of **participation** (and set-out) from householders
- capture a **high proportion** of recyclable and compostable waste from households.

Research[13] indicates that the following features are those most likely to guarantee these attributes:

### Service reaches all households

Every household should be provided with a doorstep or boundary collection service, including all flats.

### Wide range of materials collected

Ideally, dry recyclable materials collected will include paper, glass, cans, plastics, cardboard, textiles and batteries. The greater the number of materials collected, the more people are likely to participate and the greater the amount of material people will put out for collection.

For example, Recoup has reported that when plastic bottle collection is added to existing recycling schemes, capture rates of other materials typically increase by 10-30 per cent.

Collecting food waste has also been found to have great potential for increasing overall recycling rates.[14] If certain materials are excluded from the collection then an explanation for this should be given to householders and advice on the nearest bring sites should be offered.

### Good education and customer care

In order for kerbside recycling schemes to work, households need to be clear about what they can and cannot recycle, as well as why they should recycle.

Customer care can take many forms including operating a telephone hotline service, having a dedicated web page for information, delivering leaflets or newsletters, doing face-to-face education about the service or liaising with local schools. A combination of measures is the best way to reach a wide audience. Once a scheme is in place it is important to continually reinforce the message with regular information about the service.

Canvassing involves face-to-face conversations with householders on their doorstep, in order to promote recycling services and encourage residents to recycle. This is a very successful technique - Devon Waste Partnership found canvassing led to a 20 per cent increase in the tonnage of recyclables collected.

Letting the public know about what happens to the materials once after they have been collected also helps to reinforce the 'feel-good' factor and encourages participation. Recycling can be the platform from which many people can be educated about their environment and good citizenship.

Councils should also promote and support waste minimisation schemes. These include the use of home composting, local bring banks and household amenity sites as well as opportunities to reduce waste and reuse items where possible. For example, this could include preventing food waste and promoting furniture reuse schemes, nappy washing services, local refillable schemes and low packaging shops and markets.

## WRAP & Recycle Now

The Waste and Resources Action Programme (WRAP) is a Government funded agency which provides support for local authorities on recycling, including funding and training. WRAP's website at www.wrap.org.uk/local_authorities/index.html has useful resources and information, including toolkits & good practice. WRAP runs Rotate, an advisory service on collection programmes and local communications, and also promotes recycling and resource efficiency in business, manufacturing, retail and construction.

WRAP also aims to increase the level of public participation in recycling and runs the Recycle Now campaign, working closely with councils, retailers and other organisations to make sure the recycling message is heard – see www.recyclenow.com/

The Recycle Now Partners website at www.recyclenowpartners.org.uk/index.html offers many resources for local authorities, for example on developing recycling communications campaigns.

## Frequent recycling collections – ideally weekly

Weekly collections are more convenient for householders than fortnightly collections, as households won't need to store their materials for long.

All households should be provided with a separate food waste collection on a weekly basis. For more information see the briefing on food waste collections at www.foe.co.uk/resource/briefings/food_waste.pdf

## Alternate weekly collections

Alternate weekly collection (AWC) usually means that recycling is collected from households in one week and rubbish is collected the next, although some councils collect recycling on a weekly basis. Nearly half of UK councils have adopted this system.

AWC has been found to encourage residents to recycle more of their rubbish. Reducing the frequency of the residual waste collection to fortnightly can also encourage more people to recycle and helps to prevent waste as long as the container size is not increased.

However, in Friends of the Earth's view the frequency of refuse collections should only be reduced to fortnightly where a comprehensive recycling and composting scheme, including the collection of kitchen waste, has been established and the system has been well communicated. AWC can work well when local communities are involved in the decision and understand the environmental benefits.

It is best for local councils to decide whether AWC will be suitable for their area, after consultation with residents and a well-designed education programme. Before fortnightly rubbish collections are introduced, it is important to have weekly food waste collections, which help to avoid smells and flies.

## Provide an easily storable container

Yields of materials for recycling have been found to be higher in areas provided with a bag or box compared to similar areas without.

Trials in Bath in 1993 found that yields of materials for recycling were over 50 per cent higher in areas provided with a bag or box compared to similar areas without.[15] There is a wide variety of containers available for collections and it is important to recognize that different shapes and sizes will suit different households and the space available in different kitchens. Also, certain materials will require specific containers, for example, glass needs to be stored in a sturdy container to prevent it from being broken, but paper may be better kept in bags as these can be stored more easily. Multi-material collections with kerbside sorting will require a basket or box to be provided rather than a bag. It may be beneficial to consult with residents to find the most appropriate container for their needs.

## Involve separation of materials at the doorstep

There are two possible recycling collection systems:

• **Commingled collections** mean materials are mixed up together and separated later, usually at a materials recycling facility (MRF). Householders will usually be given a high-volume coloured plastic bag or wheelie bin.

• **Source-separated collections** mean materials are separated at the kerbside, usually into a specially designed lorry with different compartments for different materials. Householders will usually be given a low-volume plastic box.

Materials separated at the kerbside will be less contaminated than those sorted at a central material recycling facility (MRF) and will therefore require less treatment. Cleaner materials are more valuable to reprocessors and a higher proportion of these can be recycled.

For more information please see the briefing on recycling collection systems at www.foe.co.uk/resource/briefings/recycling_collections.pdf

Friends of the Earth have joined with recyclate reprocessors (including glass, paper, aluminium and textiles) and community recycling groups to form the Campaign for Real Recycling (CRR), which promotes high quality recycling, in particular separate collection. More information can be found at www.realrecycling.org.uk/

## Incentives to increase participation

Providing householders with financial incentives can increase participation and recycling rates and we support the concept of people paying less if they recycle more. These should be designed to not have a disproportionate impact on any particular sectors of society. They should only be introduced when good doorstep recycling and composting services have been in place for two years and there must be effective consultation and communication with local people.

Reducing the size of the refuse container and charging more for a larger bin or extra bin bags can help to encourage people to take part in the recycling scheme. It can be easier to reduce the amount of waste that people set out if the collection scheme is not tied into using large containers, i.e. 240litre wheelie bins. Other ways to involve residents include offering a free or reduced rate home compost bin and developing a reward scheme for high recyclers. Where possible, it is preferable for people to home compost rather than take part in collection schemes for green waste.

## Compulsory recycling

Introducing compulsory recycling is an effective measure for encouraging participation in collection schemes, and has been found to require little or no enforcement to generate good results.

Households that aren't recycling can be identified and engaged with to ensure that they understand the system. Using legislation such as the Environmental Protection Act and fixed-penalty notices fines is rarely necessary.

Several councils have successfully implemented compulsory recycling. In Barnet, recycling tonnages rose by 28 per cent in the first year of the scheme and in Harrow, compulsory recycling helped to boost dry recycling rates by 50 per cent in the first year.[16]

# Best practice for specific recyclables

### Weekly food waste collections

Separate food waste collections offer the biggest potential for improving recycling rates.

Separated food waste can be treated biologically - broken down by the action of micro-organisms, either aerobically (in the presence of oxygen) by composting or anaerobically (in the absence of oxygen) by anaerobic digestion (AD). The residue remaining after these processes can be used as a soil conditioner. These are the best treatments for food waste and other biodegradable waste in terms of climate change.

AD has the advantage of also generating 100 per cent renewable energy exclusively from the biomass portion of waste.[17] For more information see the briefing on AD at www.foe.co.uk/resource/briefings/anaerobic_digestion.pdf.

The new Waste Strategy for England, published in May 2007, strongly supported collecting food waste for treatment by AD,[18] stating "AD has significant environmental benefits over other options for food waste" and therefore "the government wishes to encourage more consideration of the use of AD both by LAs and businesses."

As well as cutting waste, increasing recycling and tackling climate change, weekly food collections also help counter criticisms of fortnightly waste collections, which largely centre round kitchen waste. Removing food waste from bins reduces smells and vermin associated with fortnightly rubbish collections.

## Garden waste collections

Garden waste makes up around a fifth of household waste, so it is another big fraction of our waste which can be diverted from landfill. Introducing a free garden waste collection can increase the total amount of waste collected, as some households will stop composting their garden waste at home and will instead put it out for the council to collect.

Therefore, in our view, councils should first promote home composting of garden waste through subsidised or free composting bins and education programmes. They can then introduce a paid collection service of garden waste for treatment with windrow composting. Local brown field sites can be used for small scale composting, and compost can be sold or offered free to local residents and businesses.

## Why keep food and garden waste separate?

Some councils collect food and garden waste together in the same bin. This is not ideal as research has shown that the cheapest way to treat separately collected garden waste[19] is open air windrow composting. However, this method cannot be used to treat food waste as food waste has to be treated in an enclosed facility, which is more expensive. Collecting food and garden waste together therefore means that it all has to be treated in an enclosed facility.

Although enclosed windrow composting and in-vessel composting are suitable for treating food waste, it is best to use AD, as this will also generate 100 per cent renewable energy.

## Glass

In order to re-melt glass into new containers, it requires a high level of purity and to have been sorted by colour. Mixed or crushed glass, such as that separated in MRFs, is of no use for re-melting and is usually sold much cheaper for use as aggregate.

There is a big environmental benefit to recycling glass - each tonne of glass re-melted in the UK saves 314kg $CO_2$. However last year 280,000 tonnes of glass collected for recycling was not suitable for re-melting.[20] Unfortunately there is no environmental benefit from using glass to make aggregate as it creates 2kg of $CO_2$ per tonne of glass collected.[21] Therefore to be of benefit to the environment, glass should be separated by colour as it is collected.

## Plastic

Plastic is light, but bulky to collect and store. As a result, some local authorities avoid collecting it, even though plastic collections are extremely popular with residents. Many other local authorities do collect plastic bottles (usually made of PET or HDPE), for which there are strong markets, but will not collect other plastics.

However, a recent report from WRAP has found that it is environmentally and economically viable to recycle mixed plastic waste. WRAP has set itself a target to help develop 500,000 tonnes of mixed plastics reprocessing capacity in the UK by 2018 - starting by funding a 40,000 tonne capacity plant.[22] The report and presentations from the launch event are online here:

www.wrap.org.uk/manufacturing/projects/plastic_projects/mixed_plastics.html

### Bulky and other wastes

A free service for the collection, reuse and recycling of large electrical goods, furniture and other bulky wastes should be introduced. Councils can also promote exchange schemes, such as 'Freecycle' and 'Bring and Take' markets. Civic amenity sites should be organised to ensure very high levels of reuse, recycling and composting. Local authorities should also remove recyclable materials from street waste

## Local authority guidance

Guidance on best practice recycling is available for local authorities – for example, WRAP provide advice and support (see box on page 5) and DEFRA have issued information on implementing the household waste recycling act (available at www.defra.gov.uk/environment/waste/legislation/hwra/hwra-guidance.pdf)

However, Friends of the Earth believe that the Government should give councils much clearer guidance as to what is best practice.

We have recently published a briefing for local authorities: "Sorting residual waste: a guide for councils to save money and help the environment by cutting back on residual waste", available at www.foe.co.uk/resource/briefings/residual_waste.pdf.

## Overseas reprocessing

In some cases, recyclable materials are being sent abroad, in particular to Asia. This can seem illogical and also cause doubt that materials are actually being recycled, especially if recyclables are being collected in a commingled scheme. Separate collection of recyclables produces higher quality recyclate, which is more likely to be in demand in the UK and EU.

Although we would generally prefer recyclables to be processed in the UK or Europe, the reality is that many of the manufactured goods we use are made in Asia, and so to 'close the loop' on materials we will inevitably have to export recyclable resources to those countries. Export of recyclables can make sense in energy terms, as they are going to countries such as China in containers that would otherwise be returning empty.

However, it is important that the rules on export – and their enforcement – are tightened up:

- There should be more checks on containers leaving the country to ensure that they contain the right material – e.g. paper and not mixed waste
- Regulations should be brought in to ensure that recycling is carried out with environmental standards equivalent to those in the EU, and with high levels of Health & Safety and social protection – e.g. no child labour, good wages etc.
- Councils and companies should be held to account for where their recyclables are going. The Local Government Association has said that councils need to have detailed information about where recycled items are sold or sent to.[23] Challenge your council or waste company

to see if they can say where their recycling is going.

For more information on the role of international markets in recycling, see www.wrap.org.uk/wrap_corporate/about_wrap/international_2.html.

## Case study - Newport, Wales

Newport Wastesavers is a not-for-profit, community recycling organisation. It started kerbside collections in partnership with Newport County Borough Council in 1998. Newport Wastesavers now collect recycling material from every house in Newport - 53,500 households. Over 90 per cent of Newport is urban. Rubbish bins are collected fortnightly.

Households are provided with two 55 litre recycling boxes that can be filled with paper, textiles, mobile phones and toner cartridges, metal, glass and plastic bottles. There is a Civic Amenity site and many additional recycling banks for cans, glass, paper, clothes, shoes and tetrapaks around the city. Wastesavers operate a Cleanstream recycling method, where items are sorted at kerbside.

34,000 residents are also provided with a free collection of garden waste and cardboard, with the resulting compost used in Newport's parks, gardens and school grounds. Subsidised home compost bins for kitchen and garden waste are also available.

Many flats and housing complexes have recycling mini-sites made up of four 240L communal bins. Each resident is given a recycling bag, along with an information leaflet to help them collect their materials for recycling. Residents then take the filled bags to the bins at their recycling site.

Wastesavers offers an assisted service for people who are unable to carry their boxes to the kerbside (such as the elderly or the disabled). Wastesavers also runs a Community Furniture Project which distributes unwanted furniture to houses on low income.

Wastesavers have worked on numerous initiatives to raise awareness of recycling, including interactive web games, video projects, radio advertising, roadshows and leafleting.

Comprehensive information on issues such as real nappies is available online and there is a schools education programme.

Recycling has increased from 9 per cent in 2000/01 to 31 per cent in 2006, well ahead of their Welsh Assembly target. In 2006 8,600 tonnes was collected and recycled, equivalent to over 220kg per household per year.[24] There is a low rejection rate of 0.25 per cent.

The net operational cost per tonne for the collection service is £45.69, including revenue from sale of materials.[24] High quality material from source separation mean that sales cover more than half the total cost of service.

For more information see www.wastesavers.co.uk/

## Dealing with the rest

After an intensive waste minimisation, reuse and recycling scheme, there will still be a limited amount of waste remaining that requires treating. The quantity of this waste will reduce over time, therefore ruling out large and inflexible technologies such as incineration.

Studies have clearly shown that incineration is not a climate-friendly treatment technology;[17] it is much better to deal with the waste left over using mechanical biological treatment (MBT) to removes any remaining recyclables and removes biological activity of the waste, so that it will not release methane when landfilled. These processes should occur in small, localised treatment plants.[25]

## Conclusion

Best practice kerbside recycling collections have an important role to play in reducing our impact on the environment and climate.

Friends of the Earth urges local authorities to improve their recycling rates by taking the following steps:

- Expand existing doorstep collections to all households.
- Invest in reaching 'difficult' properties e.g. high-rise, high-density and remote rural homes.
- Increase the number of materials collected and introduce separate weekly food waste collections
- Use source separated collection systems instead of commingled
- Invest in providing a good customer care service for householders so that they are encouraged to take part in the scheme and recycle as much of their waste as possible.

## Further information

These Friends of the Earth briefings may also be of interest:

Landfill Allowance Trading Scheme - how LATS works and the best way for councils to meet these targets, both financially and environmentally
www.foe.co.uk/resource/briefings/lats.pdf

Recycling collections – source separated or commingled?
www.foe.co.uk/resource/briefings/recycling_collections.pdf

Sorting residual waste: a guide for councils to save money and help the environment by cutting back on residual waste
www.foe.co.uk/resource/briefings/residual_waste.pdf.

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