

Summary briefing

**A Better Way**

**Alternatives to incinerators as a means of ensuring compliance  
with the European Landfill Directive.**



August 2001

Some local authorities are arguing that incineration is necessary to meet the UK's commitments under the Directive and/or to deal with residual waste left after maximum practical recycling levels have been achieved. Both of these arguments are untenable. If the UK does nothing more than recycle and/or compost 30% of household newspaper, card and organic waste, the first target in the directive (to reduce biodegradable waste going to landfill by 25% of 1995 levels), will have been met. The directive gives the UK until 2010 to do this. This target, and the targets for 2013 (50%) can easily be met and exceeded with technology currently available and in use. The target for 2020 (65%) may be more demanding, but we can learn from cities and regions around the world that have already achieved more than this. The directive gives the UK almost two decades to put in place the necessary systems.

Currently operating, state of the art screening and composting systems, can achieve similar reductions in the volume of solid waste to those achieved by incinerators. At the same time they can eliminate the pollution problems associated with incinerators, and provide a useful, marketable product that returns much needed nutrients to the soil..

When considering options for the disposal of materials that cannot be recycled, it is important to be aware that the incinerators can achieve a maximum 70% reduction in the mass of waste incinerated (30% is left as ash). Reduction in volume compared to landfill, where waste is normally compacted prior to burial is even less at around 45%.<sup>1</sup> The actual reductions of municipal solid waste achieved by mass burn incineration is around 55% by weight as non-combustible material (so called by-pass) has to be sorted and removed from the stream before burning.

Currently operating, state of the art screening and composting systems, can exceed the reductions in mass and volume achieved by incinerators.

When the type of composting and recycling systems described below are in place "residual waste" can be reduced to a very small fraction of municipal waste stream. These residuals will eventually be dealt with by a combination of regulatory, fiscal and consumer driven mechanisms such as extended producer responsibility legislation, (e.g. the Waste Electrical and Electronic Equipment Directive), disposal taxes (e.g. the landfill tax) and design efficiency. In the meantime, material that cannot be re-used, recycled or composted should be landfilled. There are several reasons why this is better than building incinerators:

- Incinerators do not eliminate the need for landfill. They produce contaminated ashes, which have to be landfilled. Incinerators do not solve the landfill problem and create additional ones.
- Landfill does not perpetuate the need for waste disposal as incinerators do. Source separation schemes like those outlined below mean that residual municipal waste will be less toxic and much reduced in quantity compared to that currently produced. Continuing improvements in recycling, product design and buying habits mean landfill can be reduced by orders of magnitude and eventually phased out. Incinerators on the other hand must

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<sup>1</sup> DoE 1995, Making Waste Work.

operate at near capacity for their 25 – 30 year lifetime in order for capital investments to secure a return. Once built, they are a structural impediment to significantly reduced levels of waste disposal.

- With organic materials removed from landfill, leachate will be reduced in terms of quantity and toxicity.
- Source separation of waste means that hazardous materials will be easier to identify and keep out of the waste stream. Again, toxicity of materials entering landfill will be reduced.

However we should be sure that the material that is landfilled a) has been reduced to the smallest quantity possible, and b) is as inert as possible. Landfills must of course be constructed using the best available technology. They must also incorporate feedstock control to prevent the disposal of hazardous materials. Approval for landfill developments must be strictly limited to prevent over supply of disposal capacity.

### **Dealing with the residuals**

After source separation, kerbside collection, composting and recycling there will, at least in the short term be a significant residual waste stream. This can be greatly reduced in both quantity and toxicity by Mechanical-Biological Treatment (MBT) systems. MBT systems can cut residual waste in half by combining a series of treatment steps to remove as much recyclable, organic and toxic material from the residual as is possible - before landfilling the inert, "stabilised" final product. The Edmonton system described below uses a kind of MBT system and the Isle of Wight in the UK, also has such a system.

### **It's as easy as 1-2-3**

The major problems associated with municipal waste stem from the current system, in which all types of waste are mixed and placed in a single bin for disposal. There is no magic box technology that can deal with the contaminated waste generated in an environmentally acceptable manner.

Source separation and kerbside collection of municipal waste is necessary for a modern, efficient and clean waste management system. There are many variations on source separation and collection scenarios but the best starting point is to keep discarded items in 3 separate streams:

- 1) Dry recyclables (paper/card, glass, metals, plastics, fabric etc)
- 2) Compostables (kitchen and garden waste)
- 3) Currently non-recyclable/compostable products

This is usually best done by giving households three separate bins or bags.

Additionally, hazardous materials (paint, oil, pesticides, fluorescent light bulbs etc) should of course be kept out of the municipal waste stream, either by separate collection or by utilising "bring" points at civic amenity sites or a combination of both..

**After source separation, composting is the most important step towards sustainable waste management**, because it is the organic material in landfill that causes so many environmental problems and because it generates a useful end product. This end product has various applications depending on its quality and there is a good demand for composts of varying grades. Composting enables the quantity of waste landfilled to be reduced very quickly and also reduces the toxicity of what is left (because it removes organic acids, which dissolve heavy metals in the waste and cause them to leach).

Source separated and composted organic waste enables the production of high quality compost that can be used to return nutrients to the soil. This should be the primary goal of composting domestic organic waste. Lower grade composts will be obtained by composting waste that has not been collected in a separate stream. Lower grade compost can be used in a variety of ways from landscaping to landfill cover depending on the degree of contamination.

### **Models for a better UK waste strategy**

Several cities and regions around the world have achieved close to 70% diversion of household waste from landfill, in time frames of 5 years or less, without using incineration.

**Edmonton, Canada**, (population 636,000) has already diverted 70% of household waste from landfill, without using incineration. This is a recent achievement made possible by:

- Separate doorstep collection of dry recyclables, from all households (recycling rate achieved 15 – 18%)
- Doorstep collection followed by mechanical separation and composting of the remainder
- "Take" collection points for household hazardous waste.

The only sorting Edmonton residents are required to do is for recyclables and household hazardous waste (2 bin system). The remainder is sent to a state of the art screening and composting facility, which produces a compost product in four weeks.

30 – 35% of material entering the composting process is landfilled. This is comparable to the solid waste volume reductions obtained by incineration, where 30% of material is left as ash and 10 – 15% is rejected as oversized non-combustible.

Edmonton residents have 2 containers. A blue bag for dry recyclables, (glass, paper, card, metals, plastic) and a bin for everything else.

1. Dry recyclables are processed at a materials recovery facility.
2. Householders are not allowed to put hazardous materials into the waste stream. Instead they must be taken to "Eco-Stations", which keeps dangerous waste out of the landfill and where are directed to facilities for reuse or recycling.

3. The household waste in the "everything else" bin is taken to the composting facility. There it is:
- Tipped. Oversize and unacceptable items are removed
  - Screened. The material is transported by conveyor belt to a screen which removes non-biodegradable materials
  - Composted. The conveyor moves the screened material to three aeration bays, where the material is regularly turned and air is drawn through it. After 4 weeks the compost is finely screened and the product is ready for marketing.

Details of the Edmonton system can be found at:

[http://www.gov.edmonton.ab.ca/am\\_pw/waste\\_management/](http://www.gov.edmonton.ab.ca/am_pw/waste_management/)

**Nova Scotia, Canada.** A 50% reduction of solid waste going to landfill in 5 years has been achieved. Important elements of this model are:

- Deposit/refund on all drinks containers. (Achieved >80% return rate).
- 100% access to kerbside recycling
- 2 bag collection system (green bag, blue bag)
- DoE ban on compostable organic material in landfills. (72% of residents have kerbside collection of all organic material)

Details: <http://www.gov.ns.ca/envi/wasteman/50by2000/50%.htm>

**Canberra, Australia**, has gone from 22% to 66% recovery of waste in 6 years (93/94 – 99/2000), with no incineration. The success is part of a drive to achieve "zero waste" by the year 2010 utilising systems designed to separate waste into streams to maximise recycling

Details: <http://www.act.gov.au/nowaste/wastestrategy/index.htm>

**Toronto, Canada**, North America's fifth largest city has a waste plan that will divert 30% of waste by 2003, 60% by 2006 and 100% by 2010.

Key assumptions about what it will take to make this plan achievable are:

- organics will be collected each week;
- anaerobic digestion will be the main treatment method for organic materials;
- recyclables will be collected every two weeks;
- residuals will be collected every two weeks;

The waste plan states "we are proposing transformational change, but the net result will be a simple and convenient system that will be easy for the resident to understand and take part in:

- Just one collection truck will go down the resident's street on the same day each week; it will be a modern truck with two compartments.
- On one week the truck will collect organics from a hard, animal-proof container placed at the curb, and also pick up recyclables which will be put curbside in one or more containers or bags; all dry recyclables can be "co-

mingled"- no need anymore to have a separate Grey Box for papers and Blue Box for bottles and cans.

- On the second week the organics will be picked up again, this time along with the residuals (anything that can't be re-cycled or composted).

We will begin the four-year implementation of the new program in 2002, starting with 170,000 single residences. We will expand the number aggressively in the ensuing years.

When fully implemented, the net operating costs of the new system will be about \$157 million per year (2006) or \$160 per household per year. We asked ourselves how this would compare with other, more modest approaches to resource diversion. We were delighted to discover that it compares almost equally to keeping the status quo (\$155 million or \$158 per household in 2006) or just adding weekly recycling to the status quo (\$158 million or \$161 per household). The costs per household are the base costs and do not include debt service and indirect corporate charges. Meanwhile the big payoff is in a program that is simpler to understand, easier to participate in, and much better for the environment that we live in.

More details of Toronto's Waste strategy can be found at:

<http://www.city.toronto.on.ca/taskforce2010/>

**In the UK** several schemes have achieved 50% reduction in waste disposal. The methods they use are transferable to many UK situations.

**Wye, Kent.** The WyeCycle community composting and recycling scheme has enabled the local authority to reduce mixed waste collections to once a fortnight for 1000 households in Wye and Brook. Weighings of residual waste put out for collection show average waste production to be down to 250kg per household per year.

- Kitchen waste, including vegetable, fish and meat waste is collected weekly & composted.
- Garden waste is collected separately
- Glass, paper, metals and textiles are collected weekly in a black recycling box
- All compost produced is sold as a soil conditioner and mulch.

**Mersea Island, Essex.** Have achieved a recycling rate of 57% and a participation rate approaching 90% in the 4,500 households covered.

**Wealden, East Sussex** has a 53% recycling rate using a wheeled bin collection of garden, uncooked kitchen waste and cardboard, a kerbside box for mixed paper, cans and foil and a wheeled bin for residual waste. The kerbside box and green waste bin are emptied one week and the residual refuse bin is emptied the next using the same vehicles and crew. During the first six weeks collections are carefully monitored and specific advice given to householders on an individual basis.

Wealden is a rural area and on farm composting is used to deal with green waste. A partnership between the council a private composting firm and local farmers uses open windrows to produce a soil conditioner used on local farms.

**Sutton, Surrey** has achieved a 44% using a 2 bin system and a separate collection of green waste during summer.

**What Greenpeace wants decision makers to do.**

The Governments waste policy document, Waste Strategy 2000, puts incineration with energy recovery second to last in the waste hierarchy. But because it is above landfill it is being used by many local authorities to justify plans to build incinerators. Local authorities should not use the Governments failure to provide a clear, functional, sustainable waste strategy as an excuse to incinerate. They should:

- Place incineration with energy recovery at the bottom of the waste hierarchy, below landfill of separated, stabilised waste.
- Implement three bin collection of waste from all households.
- Choose in-vessel composting as a preferable alternative to incineration.