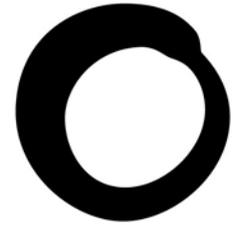


September 2007



**Friends of
the Earth**

Briefing

Up in smoke

Why Friends of the Earth opposes incineration

Introduction

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.

It might be tempting to think that we can burn our way out of this problem by building incinerators to deal with our waste. But incineration is no solution. Incineration worsens climate change, wastes natural resources, undermines recycling by demanding a steady stream of waste and causes pollution from air emissions and toxic ash.

Community groups around the country are opposing incinerator proposals and a report to Government in 2002 concluded that incineration is politically undeliverable.¹ This briefing explores the problems with incineration in more depth.

Friends of the Earth inspires solutions to environmental problems, which make life better for people.

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Moving away from 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. This pressure to divert waste from landfill, coupled with unambitious recycling and composting targets, has left the door wide open for incineration.

Councils often see building an incinerator as an easy, well established option, which doesn't have the complexity of setting up a really effective recycling and composting scheme. This view is often influenced by those waste industry consultants that tend to recommend incineration as a 'quick fix' to meet landfill targets.

For information about LATS, see Friends of the Earth's briefing on how LATS works and how councils can meet these targets without incineration.²

The English Waste Strategy - a missed opportunity

In May 2007, a new Waste Strategy for England was published, providing the opportunity to steer councils in a sustainable direction. Although the Government's position on incineration is less enthusiastic than it has been previously, unfortunately it still 'considers that there is a case, including environmental benefits, for some increase in incineration'.³

England already has 18 municipal waste incinerators, several merchant incinerators and numerous small-scale incinerators dealing with specific waste streams.⁴ In addition, there are now around 30 councils looking at incineration.

However, it won't be easy for councils to build these proposed incinerators in time to avoid fines for landfilling too much biodegradable waste in 2010. It is often very difficult to force incinerators through the planning system, as they face intense local opposition. Over 30 groups campaigning against the building of incinerators in the UK have formed a network called UK WIN (UK Without Incineration), in order to strengthen their opposition. More information on the network can be found at <http://www.ukwin.org.uk/>.

This briefing outlines the reasons local groups and Friends of the Earth oppose incineration.

Incineration wastes natural resources

The level of our consumption in the UK is already having a significant impact on the environment and communities across the world, and it's getting worse.

Sending resources up in smoke

If we build incinerators, we are not only quite literally sending resources up in smoke, but also accepting that we do not need to reduce waste. Because building an incinerator has such high capital costs, incinerator operators typically require contracts with local authorities to supply them with a minimum amount of waste to burn over a long time: 25-30 years.

In some cases, if the local authority does not supply the full amount of waste required, it has to

pay the incinerator operator to compensate for their profit shortfall (see box below). This assurance of return on investment is a logical requirement from the incinerator operators' point of view, but once incineration is established as an area's mode of waste management, the incentive on the local authority will be to ensure enough waste is produced, not to ensure that it's reduced.

The cost of not enough waste

Nottingham

Nottingham City Councillors have admitted that long term contracts agreed in 1973 on their municipal waste incinerator are now causing serious losses. The Council is required to underwrite payment for all heat produced by the incinerator, which is used to heat 5,000 council homes and 100 businesses as well as produce electricity. The Council will have to carry on paying until 2016. But income from the heat has been seriously reduced, mainly due to energy efficiency improvements carried out by the Council to their council homes. Council taxpayers are having to meet the shortfall of £100,000 per month. Another part of the contract allows the operator (now WRG) to demand that up to 100 per cent of all municipal waste collected by the City Council is brought to the incinerator until 2032. This has seriously constrained recycling by the City Council which is now one of the worst councils in the region for recycling.⁵

Hampshire

Three new incinerators have been built in Hampshire since 2003. The majority of local authorities in the county are now failing to meet their recycling targets, and recycling rates are stagnating across the county,⁶ with incinerators are now absorbing virtually all residual waste in the region.⁷ This is in contrast to the rapid increase in recycling that been happening in other areas.

Incineration 'crowds out' recycling

The incineration industry and the Government argued that incineration and recycling can exist side by side. This is true only as long as the UK's targets for reducing and recycling waste remain woefully unambitious. If paper and plastic waste were minimised and recycled as much as possible, in most areas there would not be enough left to make incineration financially viable.

Small incinerators are not economic because the costs of pollution abatement equipment tend to be the same irrespective of the size of plant to which they are fitted. Similarly, although it might appear that incinerators would not affect recycling of metals and glass, in practice there would be little incentive for separating out these materials, since they can go through the incineration process.⁸

Regional data for household waste from Denmark in 2005 clearly shows that regions with high incineration have lower recycling and regions with lower incineration do more recycling:⁹

Region	Recycling	Incineration	Landfill
Hovedstaden	21%	77%	2%
Nordjylland	29%	63%	8%
Sjælland	31%	59%	10%
Midtjylland	40%	53%	7%
Syddanmark	41%	52%	6%

It's worth noting that Denmark's recycling rate is well behind levels achieved by other regions of Europe. For example Flanders in Belgium recycles 71 per cent of municipal waste.

Incinerators with long contracts actively compete with recycling for materials, and are a barrier to waste prevention. This is a particular issue in countries like the UK where incinerators are operated by private companies with long (25-60 year) contracts which demand fixed tonnages of waste.

In the new Waste Strategy for England, the Government emphasised the need for "flexible – e.g. modular – buildings, and also flexible contracts, which do not lock in fixed amounts of waste for treatment which might become obsolete." Therefore any contracts which don't fit this description should be challenged.

Even in Waste Strategy 2000, the Government stated that "care must be taken to ensure that contracts are sensitively designed to avoid 'crowding out' recycling".¹⁰ In practice, this has led to some incinerator applications being refused permission:

- The Department of Trade and Industry turned down SITA's application to expand the incinerator at Edmonton, North London. Minister for Trade Brian Wilson justified the decision on the grounds that a larger incinerator would give North London Waste Authority little incentive to do more recycling over and above the statutory minimum; and meeting or bettering recycling targets would lead to a shortfall in the waste stream for the plant and therefore lead to waste being imported from other areas, in contradiction of the proximity principle.¹¹
- The Kidderminster incinerator was rejected on similar grounds. Following a public inquiry, the Inspector stressed that the incinerator "would achieve little... towards meeting the recycling targets and it fares poorly on the proximity principle."¹²
- In the case of the Ridham Dock incinerator, which also went to public inquiry, the Inspector concluded that if planning permission were granted, the "provision of greater incineration capacity than necessary would tend to undermine efforts to increase waste recycling and recovery locally, and encourage the transportation of waste from a more widespread catchment area".¹³

However, in many other areas, large incinerators are being planned which will jeopardise the ability of local authorities to maximise waste reduction and recycling:

- Cory Environmental has received permission to build a massive 585,000 tonne incinerator at Belvedere in the London Borough of Bexley. It will involve transporting waste from up to nine London boroughs, many of which currently have recycling rates well below the national average.
- East Sussex County Council and Brighton and Hove Council are planning a 225,000 tonne incinerator to burn up to 58 per cent of their waste in Newhaven.¹⁴ The councils have a joint contract with the waste company Onyx, which includes incineration as the main method for dealing with waste. The Newhaven Incinerator forms a core part of the Waste Local Plan which ignores the government's waste hierarchy by failing to give sufficient priority to recycling and composting.

Brighton and Hove Council recycled or composted just 25 per cent of household waste in 2005/06. The rate for the same year in East Sussex was 27 per cent. The councils' target is to recycle and compost 38 per cent of household waste by 2015, yet the Inspector of the Waste Plan said they should aim for at least 45 per cent by 2015.

The Waste Local Plan, which the incinerator is a central feature of, has been completely rejected by the public. There were 83,117 objections to the first and second versions. The Councils' response to the independent Inspector's report on the Plan attracted a further 8,429 objections. No other waste plan in the UK has caused such public controversy, with a widespread negative response from the public that the councils are meant to serve.

Incineration worsens climate change

All forms of waste disposal contribute in some way towards climate change, for example through the release of methane from landfill sites, burning of fossil fuel based plastics or emissions of carbon dioxide (CO₂) from the transport of waste.

It is often claimed that incinerators produce renewable energy, so they are part of the solution to climate change. This is incorrect - incinerators burn a mixture of fossil-fuel derived materials (e.g. plastics) and biological materials.

A waste of energy

When waste is burnt in an incinerator, heat is produced which can be used to produce electricity. This displaces the need for an equivalent amount of electricity to be generated at a power station, saving the release of some CO₂, a greenhouse gas. In Europe, many incinerators capture more energy by providing heating through hot water to nearby offices or homes (combined heat and power or CHP), but this more efficient system is only used in three of the UK's incinerators.

Simplistic claims are often made that burning waste in incinerators will reduce greenhouse gas emissions. In reality, most incinerators are not very efficient at capturing energy from the waste they burn, due to the fact that they are primarily designed to be a method of reducing the volume of waste, and they have to have a lot of air pollution control equipment.

The Government has admitted this shortcoming in the new Waste Strategy for England: "Where fossil fuel based products are incinerated (e.g. plastics) they tend to generate energy less

efficiently than using fossil fuel directly, hence are associated with an overall carbon cost”.

This means that incinerators release a large amount of CO₂ to produce a small amount of energy. A waste to electricity incinerator actually releases 33 per cent more fossil-fuel derived CO₂ per unit energy produced than a gas-fired power station.¹⁵ If heat from the incinerator is used, then performance is similar to a gas-fired power station.

The sustainable alternative

Studies have clearly shown that incineration is not the best way to divert biodegradable waste from landfill. Pre-treatment of residual waste to remove recyclables and degrade biodegradable materials (mechanical biological treatment or MBT), followed by landfill of the end material, is better for the climate than incineration, with or without recovery of heat.¹⁵

Recycling saves energy

Recycling also uses energy, much of it supplied by fossil fuel power generation. But overall it reduces climate emissions, as recycling a material uses far less energy than the extraction and processing of virgin materials.^{16,17}

In addition, research shows that recycling is almost invariably better than incineration from a climate point of view.¹⁶ A study was recently carried out for the government-funded Waste and Resources Action Programme (WRAP). It 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 CO₂ 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 CO₂ emissions from the transport sector, and equates to taking 3.5 million cars off UK roads.”¹⁷

Numerous other studies have shown that recycling saves far more energy than is captured by burning the materials. For instance, a Canadian study found the following figures for energy saved by recycling materials as opposed to burning them (see table below).¹⁸ The savings still apply when the energy used to transport materials for recycling is taken into account as this energy is relatively insignificant.

Energy saved by recycling rather than burning waste

Material	Energy saved
Paper	3 times
Plastic	5 times
Textile	6 times
Food & garden waste	None

Studies on individual materials show similar results. In ten out of eleven analyses on paper, recycling has been found to result in lower total energy use than incineration. Landfill is a better option than incineration for plastics and some papers (e.g. newspapers) because carbon in the material is trapped in the landfill rather than released into the air.¹⁹ Another study has found that recycling of plastic cups is preferable to incineration in energy terms.²⁰

Incineration pollutes

There are a number of health concerns associated with both the air emissions from incinerators and the solid emissions, or ash.

Air emissions

Incinerator chimneys emit organic substances such as dioxins, heavy metals such as cadmium and mercury, dust particles and acid gases such as sulphur dioxide and hydrochloric acid. These can have the following health effects:

- **Dioxins** – dioxins may be associated with cancer, hormonal effects such as endometriosis in women and reduced sperm counts in men, and reduced immune system capacity. They may also affect foetal development.
- **Heavy metals** – cadmium may cause lung and kidney disease, and mercury can affect the nervous system.
- **Dust particles** – these exacerbate lung diseases such as asthma or chronic bronchitis, and heart disease.
- **Acid gases** – these also exacerbate lung disease.

In May 2004 a DEFRA report on the environmental and health effects of waste management compared figures for emissions of various substances by the various types of waste management operations and found that incineration resulted in the highest emissions of nearly all of the substances including CO₂, nitrous oxides, particulate matter, arsenic, hydrogen chloride dioxins and furans as compared with other waste management options.²¹

For a fuller discussion of dioxins see Friends of the Earth's briefing on incineration and health issues.²²

The question of ash

One of the main arguments put forward for incineration is that it saves on landfill space. But a significant amount of ash is produced which still has to be landfilled and typically occupies one third by weight of the original waste. Incinerator ash contains toxic heavy metals and dioxins. This particularly applies to ash which is caught by pollution abatement equipment and prevented from going up the chimney, known as 'fly ash'. However, the main volume of the ash - 'bottom ash' - also contains some toxins, including heavy metals which are present in ash in a form more liable to leach than if they were in unburnt waste.²³

Problems with measuring health risks

- Unfortunately, assessing health risks is not easy and there are many uncertainties:
- The true impact of most chemicals and the impacts of mixtures of chemicals are very poorly understood
- It is important to take into consideration the local impacts and the effect on nearby vulnerable populations e.g. schools and hospitals
- Pollutants may already exist at high levels in some local areas e.g. nitrogen oxides emitted by high levels of traffic
- Releases from waste plants vary hugely depending on the quality of the operator

The costs of incineration

Friends of the Earth is calling for economic measures which remove the temptation to burn waste and support reducing waste and recycling. At present, subsidies and tax breaks are lavished on incineration mainly through energy policy. The Climate Levy provides the option of tax breaks on the electricity sold, business rates and on the purchase of some components. The Renewables Obligation excludes incineration, but does allow subsidies for the biodegradable fraction of waste dealt with by pyrolysis and gasification plants. Meanwhile, recycling receives no tax break or support for the energy it saves even though this is far greater than the amount recovered by incineration. However, incinerators could still end up being expensive white elephants:

- As emissions standards continue to improve, costs will increase. Waste Strategy 2000 warned that “around 30 per cent of the capital costs of a conventional incineration facility is attributable to the flue gas clean-up system. This is likely to increase significantly as tighter discharge limits require the installation of additional treatments.”²⁴
- Long-term incinerator contracts can mean penalties for councils, either from the incinerator company for not delivering the waste through-put agreed, or from the Government for failing to meet statutory recycling targets.

To ensure that the UK does not rely on incineration as a way to meet its targets under the Landfill Directive, we recommend a graduated waste disposal tax, extending the landfill tax to cover incineration and other waste disposal methods such as gasification and pyrolysis.²⁵

Creating jobs

Once they have been built, incinerators create few jobs compared with recycling (see table below). The British Newsprint Manufacturers Association found that recycling of newspapers would create three times as many jobs as incinerating them. In addition, a higher proportion of the jobs created by incineration were associated with building the incinerator, so they were not permanent jobs.²⁶

Jobs per one million tons of waste processed²⁷

Type of waste disposal	Number of Jobs
Landfill	40 - 60
Incineration	100 - 290
Composting	200 - 300
Recycling	400 - 590

A report for London ReMade suggests that 9 new jobs per 1000 tonnes recycled could be created by a kerbside collection and sorting scheme which recycles materials such as glass, paper, cans, and possibly plastics and textiles. Even more jobs per tonne of waste can be created by schemes recycling white goods and furniture (and to a lesser extent aluminium) than for the familiar local authority 'box' schemes.²⁸ The London ReMade SRB programme in the Thames Gateway area, which aims to increase the marketability of recyclates, predicts it will create 1850-2000 jobs.²⁹

Campaigning against incinerators

If you are concerned about a local incinerator plan, you can find resources to help you at <http://community.foe.co.uk/campaigns/waste/incineration/index.html>

Understanding the planning system is essential to running an anti-incinerator campaign - many useful resources including the Community Rights Resource Pack can be found at www.YourPlanningRights.co.uk

Friends of the Earth's Rights and Justice Centre runs a free advice line to help people with environmental law matters. The Advice Line is available on Freephone 0808 801 0405. Lines are open on Wednesdays 6.30 - 8.30 pm.

UKWIN (UK Without Incineration) is a network of over 30 groups campaigning against the building of incinerators in the UK – please see <http://www.ukwin.org.uk/>.

Conclusion

Incineration worsens climate change and generates energy inefficiently. It wastes natural resources and causes pollution from air emissions and toxic ash. Furthermore, incinerators are very expensive to build, often costing over £100 million. They require long contracts of around 25-30 years and need a minimum of rubbish to operate, undermining recycling.

Friends of the Earth and the community groups opposing incinerators believe that we can divert waste from landfill with more climate-friendly and resource-efficient methods.

The first priority is waste prevention, then recycling and composting or anaerobic digestion. Residual waste can then be treated by mechanical-biological methods to remove further recyclables and remove biological activity of the waste (and hence production of methane), before being landfilled. For more information please see Friends of the Earth's briefing on LATS.

In order to move us in this direction, away from incineration and towards waste reduction and re-use, we need a suitable economic framework. For instance, taxes on virgin materials would help reflect the true costs to people and the environment of extracting raw materials. Reduced taxes on recycled materials would improve their take-up; and removing the perverse subsidies for incineration would take away the temptation to burn waste that would be better re-used and recycled.

Further reading

- Dirty Truths - summary of research on the climate impacts of energy from waste and residual waste treatment and shows that incinerators that produce electricity emit more greenhouse gases than gas fired power stations.
http://www.foe.co.uk/resource/briefings/dirty_truths.pdf
- Landfill Allowance Trading Scheme - how LATS works and the best way for councils to meet these targets, both financially and environmentally.
<http://www.foe.co.uk/resource/briefings/lats.pdf>
- Pyrolysis and gasification
http://www.foe.co.uk/resource/briefings/gasification_pyrolysis.pdf
- Incineration and health issues - aimed at helping campaigners ensure that health issues are fully considered in any assessment of incineration.
http://www.foe.co.uk/resource/briefings/incineration_health_issues.pdf
- Incinerator inquiries - review of three public inquiries and a judicial hearing all considering planning permission for municipal waste incinerators.
http://www.foe.co.uk/resource/briefings/incinerator_inquiries.pdf

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