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Modern techniques fire a burning argument

By Fiona Harvey, Environment Correspondent
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Burning waste to produce energy is as old as the human use of fire, but is now seen as a modern alternative to landfill.

Older methods of burning waste in an uncontrolled fashion sometimes led to problems such as fly ash, containing toxins, escaping and contaminating nearby areas, or to the production of a toxin residue. But modern waste incineration techniques are much more thorough and more self-contained, so there is no longer a contamination risk. They are also more efficient, so that more of the energy produced by burning the waste can be captured for electricity and heat generation.

Robert Wheatley, from the consultancy Peter Brett Associates, says: “We already know how to safely extract valuable energy from residual household waste which would otherwise go to landfill. By burning it in modern plants, we can produce electricity and heat and we can even use the ash as an aggregate which would mean at least 65 per cent of waste would effectively be recycled.”

Some green campaigning groups have argued against waste incineration, on the grounds that it reduces the amount of waste recycled. But Mr Wheatley dismisses these claims, saying that what can be recycled is separated out first, leaving only the otherwise useless residue to be burned. He says: “Nobody would argue that material recycling doesn’t make sense. It’s what you do with the non-recyclable stuff that’s left over that I’m talking about.”

The potential for generating energy from waste is leading to changes in waste management around the world. For instance, China produces about 280m tonnes of municipal solid waste a year, most of which is disposed of in landfill sites at present. But the Chinese Ministry of Construction has set out a national waste disposal plan under which the amount of waste used to generate energy would be raised from 2 per cent of the total waste in 2005 to 30 per cent by 2030.

Companies from around the world are rushing to participate in this vast market. As one example, earlier this year Covanta of the US agreed to buy a 40 per cent stake in Chongqing Sanfeng Environmental Industry Company, which has designed and built two 1,200 tonne-per-day energy-from-waste facilities.

Taking waste away from landfill reduces greenhouse gas emissions, because the rotting rubbish in landfill sites produces methane, a greenhouse gas more than 20 times as powerful as carbon dioxide. Where landfill sites already exist, this landfill gas can be captured and used for energy.

As well as providing a more useful end for waste than burying it in the ground, generating energy by burning waste can also reduce carbon dioxide emissions, by replacing energy that would otherwise have to be generated from fossil fuels. Companies in the developing world that turn waste into energy can gain “carbon credits” which they can sell to companies in developed countries to offset their carbon emissions.

Carbon is thus becoming a big issue for waste companies, says Rob Winchester, head of waste infrastructure at Ernst & Young. He says: “All changes to waste management companies must now be underpinned by the climate change agenda. The opportunity exists in carbon management... Money will be made from sustainable, environmentally friendly waste management.”

The energy produced from burning waste can be used to generate electricity, or for heating. In the cement industry, waste is seen as an excellent energy source for the kilns. According to the World Business Council

for Sustainable Development, the use of household waste in cement kilns in Germany has contributed to reducing the number of landfill sites in the country from some 40,000 in the 1970s to about 350 today.

The WBCSD says cement kilns can be much better places to dispose of some hazardous wastes because they operate at very high temperatures and do not produce residual ash. Indeed, the destruction of waste material in these kilns is so thorough that in Vietnam cement kilns are being used to dispose of old toxic pesticides.

Burning waste in kilns is also an important way for cement companies to reduce their emissions: the cement-making process gives off carbon dioxide, so finding other methods of reducing emissions is a must in this industry, particularly for European cement companies which are regulated under the EU emissions trading scheme.

But in order for cement companies to reduce their carbon emissions by burning waste, the right waste facilities must be in place in the local area. This can sometimes be a problem. For example, the cement company Cemex has two cement plants in the UK which are currently trialling waste-derived fuels to help reduce emissions from the chimney. However, the company has run into supply difficulties with finding enough fuel.

This is because the kilns cannot simply shovel in waste direct from rubbish collections but must use “waste-derived fuel”, a compacted form of rubbish which is the end product of other recycling processes. There is insufficient of this waste produced in the UK, because of a lack of recycling facilities that produce refuse-derived fuel.

Cemex says it may to start importing refuse-derived fuel, which it says would make little sense. The company says it is “calling for councils to urgently accelerate the development of the UK waste infrastructure in order that we may all achieve our targets for a more sustainable future”.