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SELCHP INCINERATOR - A RISK TO HUMAN HEALTH

The SELCHP incinerator burns over a thousand tonnes of household rubbish every day. It currently takes waste from Lewisham, Greenwich and the City of Westminster, including Downing Street and Parliament and will soon start accepting waste from Bromley as well. SELCHP is owned by the French multi-national company Onyx.

Despite its flagship status within the incineration industry SELCHP routinely releases chemicals that have been linked to cancers, birth defects, heart disease and breathing illnesses.

Why do incinerators emit dangerous chemicals?

Matter cannot be created or destroyed, only be transformed into other forms. It follows that incinerators do not destroy waste, they transform it into ash and gases.

Burning household waste in an incinerator causes chemical reactions that produce and release many extremely dangerous chemicals. These chemicals are dispersed into the environment through the chimney, the residue collected in the pollution filters (filter ash and the grate (bottom) ash. Both the ashes are sent to landfill,

Some toxic chemicals are present already in the waste for example fluorescent tube light bulbs often contain mercury, PVC plastic may contain cadmium or organic tin. Electrical equipment can contain brominated flame retarding compounds as well as lead, cadmium and chromium. These heavy metals can be partially turned to gas in the intense heat of the furnace, or the chemical reactions can cause more volatile compounds containing the original metals to be formed. Some of these toxic gases are captured in the pollution control system but a proportion pass out through the chimney.

The heat in the furnace also causes many of the substances in the waste to react chemically and form dangerous new substances like dioxins. Dioxins are produced when chlorine which is found in waste like PVC plastic or wood treated with preservatives combines with carbon, found in virtually all matter.

Even government ministers have highlighted the dangers of incineration, Environment Minister Michael Meacher said, *"I repeat, the emissions from incinerator processes are extremely toxic. Some of the emissions are carcinogenic... We must use every reasonable instrument to eliminate them altogether."*ⁱ

In May 2001, Greenpeace published *Incineration and Human Health*, a comprehensive review of all available scientific data on the impacts of incineration on human health and the effects of specific chemicals discharged from incinerators.

The report reveals a wide body of evidence demonstrating negative health impacts of waste incineration, including a study published in 2000 showing that children living near incinerators were twice as likely to die of cancers. In May 2001, new medical research in the Lancet showed that toxic fumes from incinerators could be having alarming effects on the sexual development of children.

Poisons released by SELCHP

Dioxins

Dioxin is classified by the World Health Organisation as a Group 1, known human carcinogenⁱⁱ (cancer causing chemical). The Government recently recommended a five-fold cut in the recommended maximum limit for intake of dioxin, bringing the UK into line with international opinion.ⁱⁱⁱ However 30% of all people in the UK,^{iv} and 50% of toddlers^v currently exceed this safety limit.

Using SELCHP's own emission figures and the Government's recommended safety limit, it can be calculated that the SELCHP incinerator emits enough dioxin every day to give one million people their maximum 'safe' daily dose. However even this figure is likely to be a significant underestimation. One study has found that 30 – 50 times more dioxin may actually be released by incinerators than is reported by UK measuring methods.^{vi} This is due to the sporadic nature of dioxin testing at UK

The UK Government Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment recently lowered the recommended "safe" limit for intake of dioxin to 2pg/kg of bodyweight per person per day. (that is 2 thousand trillionths of a gram per kg of weight per day or). According to SELCHP'S own figures they emit over a thousand times that amount every second.^{vii}

Current average daily intake for the UK population is very close to the Governments 2 pg limit at 1.8 pg/kg. Many people already exceed that limit. Toddlers and babies are particularly vulnerable and breast feeding babies receive some of the highest doses of all as dioxin accumulated in the mothers milk is transferred to them. It is thought that infants may take in up to 12% of their lifetime exposure to dioxins through breast milk.^{viii}

The European Commission states that "a wide-range of non-cancer effects are thought to occur at extremely low levels of chronic exposure, including adverse effects on reproduction, impacts on development of the unborn foetus and associations with impaired mental ability".^{ix} The World Health Organisation says that general pollution from dioxins is already at the level where it may be having adverse effects on human health.^x

Acid Gases (hydrogen chloride (HCl), sulphur dioxide (SO₂), Nitrogen oxides (NO_x): Exposure to acid gases can cause respiratory problems. SELCHP reports emissions for 2000 of HCl 22.7 tonnes, SO₂ (no figure reported), NO_x 567.3 tonnes.

Heavy Metals Incinerators emit lead, cadmium, mercury, chromium, arsenic and other metals to air and land. Lead is associated with learning impairment^{xi} and behavioural problems in children^{xii}. High levels of cadmium are associated with lung cancer and a range of other effects and mercury exposure has been found to affect behaviour and lead to renal damage even at low levels.^{xiii} SELCHP reports emissions as lead 34 kg, cadmium 1.3 kg, mercury 11 kg, chromium (no figure given), arsenic (no figure given).

Particulate matter (dust): SELCHP releases between one and seven kilograms of contaminated particulate matter into the air every hour it operates.^{xiv} According to the European Commission "particulate matter in the atmosphere has been associated with large-scale chronic adverse effects on human health". A significant proportion of this material will be very fine particulate matter (PM10 or less). These microscopic particles can reach the deepest part of the lungs where evidence suggests they can cause respiratory and heart related illnesses. The European Commission is concerned that these sorts of particulate emissions may be having health impacts on local populations.^{xv} It has been estimated that for every 10mg/m³ increase in PM10 there is a 0.5 to 1.5% increase in daily mortality due to respiratory and heart disease.^{xvi} SELCHP emits between 4 and 22 mg/m³ of particulate matter in its stack gas, a significant proportion of which is PM10 or less. (This will of course be diluted as it leaves the chimney and is dispersed).

Incineration also leads to the generation and release of a number of other highly toxic and carcinogenic organic compounds such as benzene, phenols, polyaromatic hydrocarbons, benzo(a)pyrene, chlorinated organic compounds and soot.^{xvii}

Pollution Monitoring

Incineration pollution controls are not based on health:

"It is ...generally accepted that emissions standards are based on what can be *measured* and what is technologically achievable, rather than what is *safe*.... This point was accepted by the Environment Agency."

Department of Environment Transport and Regional Affairs Committee,
March 200,1 report HC 39-I, Delivering Sustainable Waste Management, Vol
1 paragraph 93.

Less than half a dozen substances emitted from an incinerator are continuously monitored by the plant's operators(generally only sulphur oxides, nitrogen oxides, carbon monoxide, hydrogen chloride and particulate matter). Poisonous metals like mercury, cadmium and lead are measured by point samples, generally once every three months by the operators. Dioxins are measured by point samples, at most once every three months by the operators.

The Environment Agency also send in sampling contractors once or twice a year to take measurements. These checks take place within a specified “window” of time, normally two or so weeks, agreed between the agency and the operator.

When the public registers are examined it quickly becomes apparent that despite the enormous numbers of breaches reported for the substances, which are continuously monitored, there are virtually no reports of other substances exceeding legal limits. It is difficult to accept that this is the case in reality. Reported high levels of pollutants in the gases often indicate a malfunction in the system or poor combustion of waste. For example high levels of carbon monoxide reported would indicate poor combustion conditions under which increased production of dioxins might be expected. Similarly high levels of hydrogen chloride may be the result of large amounts of chlorine in the system, which again are likely to increase dioxin formation. Any peaks in production of dioxin and other hazardous substances are however unlikely to be recorded by sampling undertaken only for a few hours, four or five times a year.

Under these circumstances, the best that could be expected is to find occasional breaches, discovered by chance when a breach occurs at the same time as “spot” monitoring is taking place. This is exactly what Greenpeace has found from examination of the limited data that is available to the public. The Environment Agency public register shows that SELCHP exceeded the legal limit of dioxin emissions to air during sampling of stack gases on 31st January 2001. Given the limited number of “spot” dioxin tests made annually, this finding suggests that SELCHP could be emitting far more dioxin than reported, or indeed allowed by the site licence. It provides further evidence that SELCHP emits more dioxin than it reports.

Energy from Waste? - A Waste of Energy.

SELCHP does not call itself an incinerator. It claims to be a “combined heat and power station” but the system for supplying heat to the local community has never been installed. However, heat from the process is used to drive steam turbines, which generate electricity, and some of this is exported to the national grid.

Incinerators are an extremely inefficient way of generating electricity. Not only do they use the available heat at a very inefficient rate but also it is a waste of energy to have to remanufacture new materials that could be recycled instead of being burnt. The highest sources of ‘energy’ in municipal waste are plastics and paper. Burning plastics, which are made from oil gives off global warming gases and producing virgin paper is an extremely energy intensive process.

One study has found that the reuse and recycling of 70% of the UK’s municipal waste would lead to a saving of 14.8 million tonnes of carbon dioxide which is equivalent to taking 5.4 million cars off the road.^{xviii}

Britain already has some of the best resources for renewable energy like wind and wave power in the world. Investing in these genuine forms of green energy is essential if we are to tackle global warming.

“We believe incineration will never play a major role in truly sustainable waste management and cannot, and should not, be classified as producing renewable energy”

Department of Environment Transport and Regional Affairs
House of Commons Committee Press Notice 21st March 2001

The Solution

Both landfill and incineration of mixed waste are inherently polluting. The Government must instead set up modern waste management schemes and state of the art recycling and composting. This should involve:

- Door to door collection of three separate coloured bins – one for “dry” recyclable material, one for compostable material and one small bin for the rest.
- Intensive composting of all kitchen and garden waste in high tech, closed vessel composting units
- Mechanical Biological Treatment (MBT) of the remaining rubbish, known as residual waste. MBT uses mechanical means to extract recyclable materials and neutralise the organic fraction so that it can be safely land-filled.

These solutions are already working in many places around the world:

One thousand households in Wye, Kent, now produce only a quarter of the waste an average UK household generates. The city of Edmonton in Canada has reduced its municipal waste by 70%. Canberra in Australia by 59%, Flanders in Belgium recycles 59% of its waste and Milan in Italy has introduced new techniques and technology for recycling, composting and dealing with residual waste.

For more information please contact Greenpeace Press Office on 0207 865 8255

- ⁱ Michael Meacher, Minister for Environment, evidence to the House of Lords Select Committee on European Communities, 11th Report, HL Paper 71, 15 June 1999, Para 40
- ⁱⁱ TCDD, the most toxic and best studied of the dioxin group, is classified as a Group 1 known human carcinogen by the International Agency for Research on Cancer (Part of the World Health Organisation). Emissions from incinerators are reported in units of toxic equivalence to TCDD.
- ⁱⁱⁱ Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment, COT/2001/07 October 2001
- ^{iv} Food Standards Agency, news release 16th Nov 2001
<http://www.food.gov.uk/news/newsarchive/dioxindiet>
- ^v Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment. Statement on dietary exposure to dioxins and dioxin-like PCB's. COT Statement 2000/03. August 2000
- ^{vi} R. De Fre, M Weavers (1998) Underestimation in dioxin emission inventories. Organohalogen Compounds Vol 36.
- ^{vii} SELCHP reports emission of around 0.02ng/m³ of gas emitted, eg in Compliance Monitoring at the SELCHP EfW Facility August/September 2000. A report produced for Onyx SELCHP Ltd by AEA Technology Environment. Note that 1 nanogram = 1000 picograms.
- ^{viii} Physicians for Social Responsibility (1994). Putting the Lid on Dioxins: Protecting Human Health and the Environment. 1101 14th St. NW, Suite 700, Washington DC 20005.
- ^{ix} European Commission proposal for a Council Directive on the incineration of waste 07/10/98 p. 6
- ^x WHO paper submitted to the Dioxin 98 conference, reported in ENDS 281 June 1998 p.5
- ^{xi} European Commission proposal for a Council Directive on the incineration of waste 07/10/98 p. 7
- ^{xii} see eg. The Independent 16th May 2000 p 11
- ^{xiii} European Commission proposal for a Council Directive on the incineration of waste 07/10/98 p. 7
- ^{xiv} Based on operator reports to the Environment Agency for 2000
- ^{xv} European Commission proposal for a Council Directive on the incineration of waste 07/10/98 p. 7
- ^{xvi} Pope III CA, Bates D and Raizenne M 1995. Health effects of particulate air pollution, in Env. Health Perspectives 103 (5): 472-480, and Schwartz 1994, Air pollution and daily mortality: a review and meta analysis. Environmental Research 64: 36 -52
- ^{xvii} European Environment Agency, Feb 2000 *op cit* p 18
- ^{xviii} R. Murray, Creating Wealth from Waste, Demos 1999, p.39