A FACTSHEET BY HEALTH CARE WITHOUT HARM EUROPE

# Threats to health and recycling: Why EU legislation must not favour incineration over better waste management options


Current EU waste law proposals look set to undermine recycling strategy by upgrading incineration. However, incineration, even when it produces energy, burns resources and harms health. Of the health hazards, ultrafine particles are still to be examined – this factsheet presents reasons for doing so.

In order to prevent Europe taking a major step backwards in its waste management policies, we have to ensure that incineration continues to be defined and understood as a disposal operation, not as energy recovery.


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In June 2007, the European Council decided to support the European Commission's proposal to reclassify efficient waste-to-energy incinerators as recovery plants. This decision challenges the traditional understanding that to incinerate waste is to dispose of it.

Since the Council has failed to provide clear means for encouraging waste prevention, materials re-use and genuine recycling, it is likely that the proposed legislation will in many cases result in disposal by incineration replacing recycling as the way society deals with its waste.

Replacing recycling with incineration will harm human health and harm the environment, undermining the EU's official goals of becoming a recycling society and the Community's Strategy for Health and the Environment.[1]

What are we burning today, Bob?
*-Haven't you heard? We don't "burn" anymore. We're recycling!*

# Health Hazards Associated with Incineration

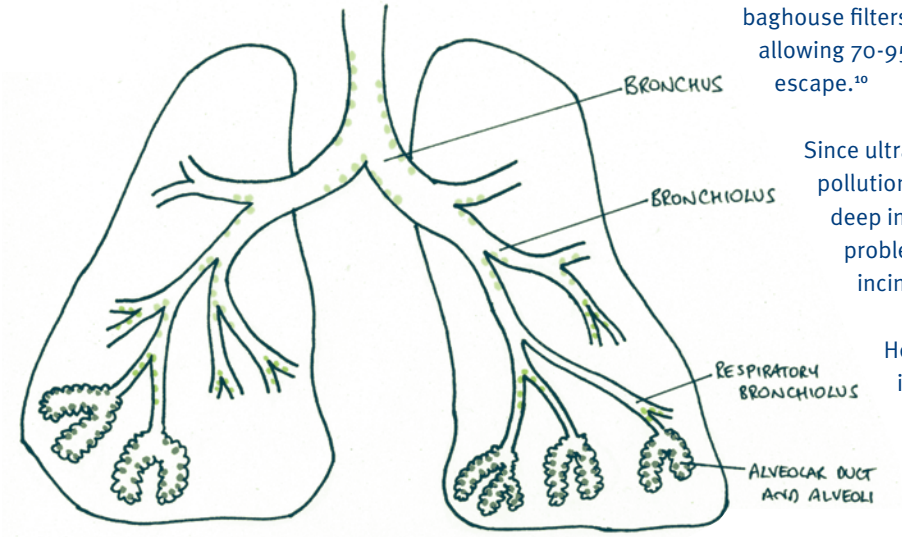
## Small Particles, Big Problems

As well as creating toxic ash and other residue, incinerators emit very small particles produced when they burn waste. These particles can travel long distances and penetrate deep into the respiratory system, where they cause increases in mortality from a range of cardiac and vascular diseases and cancer. [2,3,4]

The coarser particles (PM10) can be trapped by the nose and throat before being excreted. Few PM10 particles penetrate the lungs beyond the bronchioli (see diagram). Fine particles of size PM2.5 to PM1 are small enough to penetrate deep into the lower, most sensitive parts of the lung. It takes approximately five years for the human body to excrete just half of these particles.[5] Healthy lungs retain about 50% of the fine particles to which they are exposed.[6]

Smaller still, capable of penetrating even deeper into the lungs, and potentially even more harmful than fine particles are ultrafine particles. These are smaller than 0.1 micrometers in diameter, and can be as small as 0.001 micrometers. Whilst PM10 and PM2.5 are regulated by EU law, ultrafine particles are yet to be contemplated.

All particles can cause health damage, especially when coated with toxic metals and organic compounds (particularly likely when the particles come from incinerators). The chemicals coating the surface of the particle erode off in the lungs and are then transported through the lining of the lung into the bloodstream.




How fine and ultrafine particles are captured in the lungs. PM10 penetrates as far as the large bronchial tubes. PM2.5 is respirable, penetrating deeper to the pulmonary bifurcations. Ultrafine particles penetrate deeper still, into the alveolar regions. The alveolar region is non-ciliated, and therefore cannot actively expel the particles.

### Your doctor recommends not incinerating waste

In 2006, 68 international medical and health experts drew up the Paris Appeal Memorandum in order to highlight the relationship of cause and effect between chemical pollution and disease, and outline the political action necessary to tackle the problem.

The Memorandum included a moratorium on the building of new incinerators and a ban on the incineration of hazardous waste[17] and has since been signed by the Standing Committee of European Doctors (CPME), composed of all the national medical associations of the EU and representing some two million doctors.

Even when the ultrafine particles are not particularly toxic, there is strong evidence that they can initiate "oxidative stress" in the lung – a process which alters lung cell chemistry, causing inflammation and setting in motion a cascade of health problems.[7,8]

The problems don't end with the lungs. Many ultrafine particles are small enough to cross over the lung membranes and be carried into the bloodstream. Here they cause immune responses such as thickening of the blood, which leads to an increased chance of heart attacks and strokes.[9]

Fine and ultrafine particles would pose less of a health problem if we could rely on filter technology to capture them. Unfortunately, many ultrafine particles are too small to be captured by many of even the most modern air pollution control devices installed in incinerators. The commonly-used baghouse filters trap only the coarser ultrafine particles, allowing 70-95% of the more dangerous PM2.5 particles to escape.[10]

Since ultrafine particles cannot be captured by most pollution control systems, and once released penetrate deep into the lungs, the only way to prevent health problems caused by nanoparticle pollution from incinerators is **not** to incinerate waste.

Hence any legislative proposal that will result in more incineration rather than less, such as reclassifying incinerators as recovery operations, endangers human health rather than protects it.

## A Hazards Miscellany

Nanoparticles are not the only health hazard created by the incineration of waste. The reactions that happen inside incinerators when they burn waste, and afterwards when the generated gases cool, create hundreds of different chemicals.

This mixture of chemicals, many of unknown composition, enters the environment via a range of routes. Some are released as gases, some are trapped in ash and filtration blocks which are disposed of at landfill. What escapes, in what quantities, and how hazardous it might be, is largely uninvestigated and unknown. The effects on human health of the by-products of incineration are therefore also unknown.

We can, however, be sure on three points. Firstly, incinerators cannot clean up the waste they are fed. If mercury and other heavy metals go in, heavy metals come out. Secondly, burning waste produces dioxins and other persistent, bioaccumulative and toxic compounds. These are either trapped in bottom and fly ash or released into the atmosphere in flue gases. Thirdly, a growing body of evidence strongly suggests that communities living close to incinerators suffer increased incidences of cancer and respiratory problems.[11,12,13,14,15,16]

So, whatever it is that we don't know about incinerator emissions themselves, we can be pretty sure about their cumulative effects on human health. They aren't good, and they certainly aren't worth exacerbating.

### European Court of Justice rules that disposal is... disposal

In 2003 (case C-458/00) the European Court of Justice ruled that dedicated municipal waste incinerators are disposal operations.[18] The judgement was based on the primary use principle, which says that an operation should be classified according to its primary purpose. An incinerator, because it is built to dispose of waste, must be a disposal operation - even if there are ways to reclaim the energy it generates when it burns waste.

# Reclassification will make a mess of recycling

## Inefficient Efficiency Formulae

The European Council has proposed using an energy efficiency formula to classify incinerators as either recovery or disposal operations:

**Energy efficiency = [Ep - (Ef + Ei)] / [0.97 x (Ew + Ef)]**

The problem with the proposal is that it doesn't take into account how efficient an incinerator is in comparison to other options for dealing with a particular waste stream.

Suppose the incinerator feedstock were paper and that burning the paper could make the incinerator, according to the equation, energy-efficient enough to count as a recovery plant. Does that make incineration a good way to deal with paper?

You can't answer the question until you know the relative efficiency of a paper recycling plant. Relative to a paper recycling plant, the incinerator could be incredibly inefficient: if so, it shouldn't be dealing with paper when the paper could instead go to a recycling plant.

Therefore, the efficiency equation needs to be accompanied by legislation which ensures that paper is separated in the collection process and treated in the recycling plant, not burned in an incinerator. The same goes for all other waste streams – they must be channelled towards the safest, most efficient methods for dealing with them.

Since the text from the Council doesn't guarantee separation of waste streams and channelling them towards the most efficient treatment processes, up-grading incineration will result in less efficient processes (such as incineration) replacing more efficient alternatives (such as recycling).

## Why incentivise disposal when there are better alternatives?

Cases from around the world, including San Francisco and Boulder, Colorado (USA), Canberra (Australia), Novara, Treviso and dozens of others (Italy), Molins de Rei, Tona and Blanes (Spain), prove that segregation, composting, re-use and recycling programmes can reduce the waste stream to a level that renders incineration unnecessary.

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17 M145 and M146 in the memorandum: http://www.artac.info/static.php?op=MemorandumParisAppeal.txt&npds=1
18 http://www.eurits.org/pages/courtcases/case45800.pdf



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