Waste incineration contributes to the unintentional releases of mercury into the atmosphere. Most of the mercury from wastes that are incinerated is thermally released during the combustion process and emitted directly into the atmosphere, with most of it returning to the earth through rain or dry deposition. Normally, the mercury content in the medical, hazardous, sewage sludge and municipal solid waste streams originates from discarded products and chemicals that contain or contaminated with mercury such as paint residues, discarded electrical equipment, thermometers, pharmaceuticals, fluorescent lamps, dental amalgam waste, batteries, and laboratory chemicals among others.

The mercury content in the general waste stream originates from three main groups of inputs:

1) intentionally used mercury in discarded products;

2) natural mercury impurities in high-volume materials (plastics, paper, etc.) and minerals;

3) mercury as a human-generated trace pollutant in high-volume (e.g. recycled) materials.

The mercury concentrations in the waste stream are directly dependent on the inputs of mercury to the waste. If possible, mercury sources should be separated from the mainstream waste before incineration. An issue that causes concern is the disposal of the residual ash that most surely contains mercury (if the waste incinerated contained or were contaminated with mercury) as well as the mercury that is entrapped in the pollution control systems. Mercury-containing waste should never be burned or incinerated unless special flue gas controls are in place to capture the mercury.

Relevant legislation and NGO policy work

In the EU
The EU adopted the Waste Incineration (WI) directive, which entered into force in 2000. The aim of the WI Directive is to prevent or to reduce as far as possible negative effects on the environment caused by the incineration and co-incineration of waste. In particular, it should reduce pollution caused by emissions into the air, soil, surface water and groundwater, and thus lessen the risks which these pose to human health.

This is to be achieved through the application of operational conditions, technical requirements, and emission limit values for incineration and co-incineration plants within the EU.

The WI Directive sets emission limit values and monitoring requirements for pollutants to air such as dust, nitrogen oxides (NOx), sulphur dioxide (SO2), hydrogen chloride (HCl), hydrogen fluoride (HF), heavy metals and dioxins and furans. The Directive also sets controls on releases to water resulting from the treatment of the waste gases. Most types of waste incineration plants fall within the scope of the WI Directive, with some exceptions, such as those treating only biomass (e.g. vegetable waste from agriculture and forestry). Experimental plants with a limited capacity used for research and development of improved incineration processes are also excluded.

The WI Directive makes a distinction between:

a) incineration plants (which are dedicated to the thermal treatment of waste and may or may not recover heat generated by combustion) and

b) co-incineration plants (such as cement or lime kilns, steel plants or power plants whose main purpose is energy generation or the production of material products and in which waste is used as a fuel or is thermally treated for the purpose of disposal).

The WI Directive provides for public consultation, access to information and participation in the permitting procedure.
Transposition into national legislation was necessary by 28 December 2002. From this date on new incinerators have had to comply with the provisions of the WI Directive. The deadline to bring existing plants into compliance was 28 December 2005.

The emission limit values set for mercury can be seen below (Directive 2000/76/EC):

**Articles**

*Incineration*

*Co-incineration*

**Art 7 (Air Emission limit values)**

1. Incineration plants shall be designed, equipped, built and operated in such a way that the emission limit values set out in Annex V are not exceeded in the exhaust gas.

**Annex V: Air Emission Limit Values**

*Member States may lay down rules governing the exemptions provided for in this Annex.*

3. Co-incineration plants shall be designed, equipped, built and operated in such a way that the emission limit values determined according to or set out in Annex II are not exceeded in the exhaust gas.
Annex II: Determination of Air Emission limit values for the co-incineration of waste

Member States may lay down rules governing the exemptions provided in this Annex.

Daily average values

II.1 Special provisions for cement kilns co-incinerating waste

Total Emission Values

Hg 0.05 – 0.1 mg/m³ (30 min – 8 hrs)

Hg 0.05 mg/m³

Furthermore, the Integrated Pollution Prevention and Control (IPPC) Directive (96/61/EC), has been in place since 1996 and also refers to the Cement production sector. The Commission has undertaken a 2 year review to examine how the legislation on industrial emissions could be improved.

As a result, the Commission adopted on 21 December 2007 a Proposal for a Directive on industrial emissions recasting seven existing Directives (the IPPC Directive and six sectoral Directives) into a single legislative instrument. One of these six sectoral directives is the WI directive.

Following the co-decision process on this Proposal, the Directive on industrial emissions 2010/75/EU (IED) has been adopted on 24 November 2010 and published in the Official Journal on 17 December 2010. It has entered into force on 6 January 2011 and has to be transposed into national legislation by Member States by 7 January 2013.
IPPC and now IED sets out the main principles for the permitting and control of installations based on an integrated approach and the application of best available techniques (BAT) which are the most effective techniques to achieve a high level of environmental protection, taking into account the costs and benefits. For more information on the directive please visit the EC website.

The benchmarks or criteria on which BAT relies are described in the BAT Reference Documents (BREFs). The first BREF on Waste Incineration was published in 2006.

Through the implementation of the IED, the role of the BREFs will be strengthened. After a BREF is completed, it should be subject to BAT conclusions that are adopted through a comitology decision (implementing act). The right of initiative however rests with the Commission. BAT conclusions contain parts of the BREF, their description, information on applicability, including BAT Associated Emission Levels (BATAELs) for different pollutants (meaning emission levels that can be achieved for a pollutant if the industry is implementing BAT) as well as associated consumption levels and monitoring. It may also include site remediation measures “where appropriate”. Within 4 years after publication of the comitology decision on the relevant BAT conclusions, local authorities should review and update all the permits to the respective industries in order to make sure the industrial activity operates according to the requirements set out in the BAT conclusions. The provision in the IED requires that Emission Limit Values (ELVs) for pollutants set out in the permit should not exceed the relevant BATAEL. However the permit writer may derogate in specific cases and set higher ELVs under certain conditions. An assessment needs to demonstrate that the application of the BATAEL would lead to disproportionate higher costs compared to the benefits due to the local conditions (technical characteristics of the plants, or geographical location or local environmental conditions). In any case no significant pollution may be caused and a high level of protection of the environment as a whole is achieved. Environmental Quality Standards also need to be respected. These derogations are subject to public participation and scrutiny by the public concerned, which includes NGOs.

Globally

Many countries around the world regulate this sector.
For the US see relevant pieces of laws and regulations at [http://www.epa.gov/hg/regs.htm#regs](http://www.epa.gov/hg/regs.htm#regs)

**Reduction of Toxic Air Emissions from Combustion Sources that Burn Hazardous Waste** - This proposed rule would reduce emissions of toxic air pollutants, including mercury, from five types of combustion sources that burn hazardous waste (incinerators, cement kilns, lightweight aggregate kilns, boilers, and hydrochloric acid production furnaces). Sources that would be affected by the proposal combust hazardous waste in order to treat or detoxify the waste.

The ZMWG has been following this issue closely and has been giving respective feedback at the global mercury negotiations. See also the [ZMWG Report: MERCURY RISING, Reducing global emissions from burning mercury-products](http://www.epa.gov/hg/regs.htm#regs), [4 February 2009]