



The Hazardous Waste Business and Climate Change mitigation



The relationship between hazardous waste from industrial sources and greenhouse gas emissions is two-way. On the one hand their generation and subsequent treatment are potential sources of emissions, and on the other hand, they are also an opportunity to reduce emissions as they can be converted into alternative fuels.

Organic waste can be converted into fossil fuel alternatives and the emissions are considered neutral. Inorganic waste can also be converted into fuels but the emissions are not neutral, moreover, combustion must be done properly to avoid other pollutant emissions

In order to treat waste, energy consumption, biological treatments and materials recovery must be considered. In biological treatments, from the climate change point of view the decay of organic matter must be monitored, without allowing a methanisation process to occur.

In the heat treatment of waste, incineration releases energy from the waste and it can therefore supply electricity, steam and hot water. This is recommended when used as a substitute for the burning of fossil fuels, and done with the appropriate technology and control.

For many industrial sectors the use of waste as fuel is a competitiveness factor. Among this waste we find: used oils, solvents, plastics, tyres, paper, purification plant sludge, wood waste, etc.

Capturing biogas in tanks is an advisable practice, especially when used as a fossil fuel substitute.

Relationship of industrial waste to greenhouse gas emissions

The relationship of industrial waste to greenhouse gas emissions is two-way, as on the one hand their generation and subsequent treatment may be a source of potential emissions, and on the other hand they can be converted into alternatives to traditional fossil fuels.

FROM ORGANIC SOURCES

- Can be converted into fossil fuel alternatives. Emissions considered neutral.
- Risk of methanisation, if not properly managed, leading to net emissions of greenhouse gases.

FROM FOSSIL SOURCES

- Can be converted into fuels
- Emissions are not considered neutral
- Must be done properly to prevent other polluting emissions

Emissions mitigation alternatives in the hazardous waste business

THE GENERAL PHASES OF TREATING HAZARDOUS WASTE FROM INDUSTRIAL SOURCES

- The energy consumption derived from treatment of the waste
 - Heat and electricity required for operation of the facilities. For example, heating, lighting and electricity for the facilities and equipment.
 - Opportunities for improving the optimisation of energy management, the use of cleaner fuels or the use of waste as fuel.
- Biological treatments
 - Are adequate but must be effective in their task of decomposing organic matter without allowing a methanisation process to occur
 - Anaerobic digestion is the exception, as its purpose is biogas production for its subsequent capture and combustion.
- Materials recovery
 - The best environmental alternative is to avoid generating waste.
 - For such waste as has been generated we shall explore the potential for reintroducing it into the various production processes.
 - In some cases an additional treatment is required for reintroduction into the production process.

HEAT TREATMENT OF WASTE

Heat treatment is a process wherein heat is applied to waste to reduce its volume, and some of its most polluting features, before final elimination. There are three main types of heat treatment:

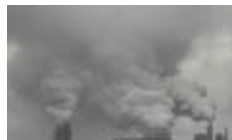
- Incineration
The most widely applied heat treatment technique for waste, based on complete oxidative combustion. There is no standardised emission factor, as it depends on the composition of the waste and the unit emission factor.
- Pyrolysis
Is the degassing of waste, based on heat degradation of organic matter in the absence of oxygen, during which pyrolysis gas and solid coke are formed.
- Gasification
Is a partial combustion of organic substances and produces gases that can be used as fuel.

INDUSTRIAL USES OF WASTE AS FUEL

- The use of hazardous waste as fuel must be specifically studied for each case by the competent authority in each country, in order to be validated and authorised, as in some countries there may be effects on human health and the environment.
- Industrial sectors with the greatest use of waste as fuel
 - Economic opportunity and competitive advantage
 - Cement and electricity production for public use above all, but also the ceramics, paper, lime, and steel industries among others.
- Types of waste used as fuel
 - Mainly used oils, solvents, plastics, tyres, paper, animal waste, purification plant sludge, wood waste and forestry waste such as straw and pruning remains.

4. CAPTURE OF BIOGAS IN LANDFILLS

- Biodegradable organic wastes decompose and form methane, among other gases, which has a warming effect greater than that of CO₂.
- Energy capture and usage techniques are applied.
 - An especially advisable practice when being substituted for fossil fuels.



Case study:

Cementos Lemona at their Lemoa factory.

(Source: www.sicagroup.com)

The factory is very close to the town centre. The various alternatives desired for implementation in the production process have kept a permanent negotiation open in order to coexist, and so that both the Municipality and the industrial activity may develop.

GENERAL MEASURES TO REDUCE EMISSIONS

- The main improvement initiatives, with which a 20% increase in production capacity was also obtained.
- At present, old tyres, animal flours, plastics from the electrical-electronic sector, municipal solid waste (MSW) plastics and wood, are used.
- The amount of biomass, for which CO₂ emissions are considered neutral is 20,000 tonnes, approximately 20% of the total, with a reduction in CO₂ emissions of 40,000 tonnes/year.
- The reuse of waste in cement ovens carries substantial advantages with respect to the life cycle analysis

RESULTS

The potential for reducing greenhouse gases in the energy sector, through measures for improving energy efficiency as well as from the use of alternative fuels, must be realised with the appropriate technology and a system for tracking and controlling emissions, which permits verification of compliance with emissions parameters.