

# Gasification, Pyrolysis & Plasma Incineration

## What are waste gasification, pyrolysis, and plasma treatment/disposal technologies?

Gasification, pyrolysis and plasma technologies heat waste materials to high temperatures, creating gas, solid and liquid residues. The gases are then combusted, releasing hazardous pollutants. These technologies are considered “incineration” by the European Union, and are being considered in the U.S. for medical, municipal and hazardous wastes, which could reverse decades of progress in pollution prevention, waste prevention, and recycling. Other forms of municipal solid waste incineration (mass burn and refuse-derived-fuel) are no longer being built in the U.S.

**Releasing Toxics:** The same toxic byproducts can be released from these incinerators as from other incinerators, including dioxins and furans, mercury and other heavy metals, particulate matter, carbon monoxide, hydrogen chloride, sulfur dioxide, and more, as well as toxic contaminants in the char or ash residues, and contaminated waste water. Many of these pollutants are carcinogenic and threaten public health even at very low levels. Recent tests from municipal solid waste (MSW) in a test pyrolysis facility in southern California found more dioxin, VOCs, NOx, and particulate emissions than existing mass burn incinerators in the region.

Read case studies of gasification, pyrolysis and plasma incineration that illustrate concerns about emissions, energy and expense at [www.no-burn.org](http://www.no-burn.org) and [www.greenaction.org](http://www.greenaction.org)

Some companies claim that these technologies are “pollution free” or have “zero emissions,” but these claims have been shown repeatedly to be untrue. Since 2003 numerous proposals for waste treatment facilities hoping to use plasma arc, pyrolysis, catalytic cracking and gasification technologies failed to receive final approval to operate when claims of the companies did not withstand public and governmental scrutiny. Companies using or promoting these technologies claim that they are not incinerators, ignoring the fact that the toxic gases created by heating the waste are in fact combusted – incinerated.

**Wasting Energy:** These technologies require a great deal of energy to operate, and some facilities have consumed more energy to operate than could be produced. Like classic incinerators and landfills, energy savings from waste prevention and recycling is likely greater than the energy produced in these disposal facilities.

**Technical and Financial Problems:** The financial and technical feasibility of these incinerators is questionable. The only medical waste facility in the U.S. that uses plasma arc (the Hawaii Vitrification Facility run by Asia Pacific Environmental Technologies) has had serious and repeated operational problems as well as permit violations. A largest MSW gasification facility (Thermoselect, located in Germany) recently closed after only a few years of operation with chronic technical problems and losses of \$500 million.

**The Big Picture:** Even if gasification, pyrolysis, and plasma arc could be made safe, the question remains: could they be made sensible? As with traditional incineration and landfilling, these approaches lead to exploiting more natural resources, rather than resource and energy conservation.

## Incineration is disposal to air

Although the volume of garbage appears to be greatly reduced by gasification and incineration, no technology can make anything actually disappear. Mass can neither be created nor destroyed, only changed.\* *The gas, smoke, and liquid and solid wastes that leave a facility will have the same mass as the solid materials entering the facility.* Masses of gas and particulates will go up the stack, toxic ashes and solid wastes will need to go to landfill, and liquid wastes will also need to be managed.

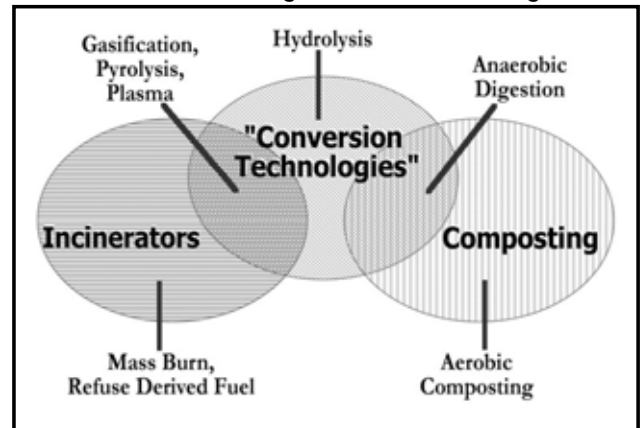
\*Encyclopedia Britannica, [www.britannica.com/eb/article?tocld=49377](http://www.britannica.com/eb/article?tocld=49377)

## California scheming

California is the staging ground for the attempted U.S. incinerator industry revival. Many local governments are currently considering some form of waste incineration. Since 2003 numerous proposals for waste treatment facilities hoping to use plasma arc, pyrolysis, catalytic cracking and gasification technologies failed to receive final approval to operate when the claims of project proponents did not withstand public and governmental scrutiny of key claims.

California calls these technologies – and others that claim to produce energy from garbage – "conversion technologies". Unfortunately anaerobic digestion of source-separated organics, a form of composting, is lumped in the same category. This "conversion technology" term is only used in California, while other jurisdictions where these technologies actually exist, such as the European Union, consider gasification, pyrolysis, and plasma to be incineration.

Orwellian language: California's "Conversion Technologies" is a misleading term



This industry wants California to consider incinerator approaches like gasification equal to discard reduction, recycling and composting by saying they will "divert" garbage from disposal in landfills. But these incinerators dispose garbage to the landfill-in-the-sky and actually create new pollutants. The industry even attempts to package garbage as "renewable energy", but waste prevention and recycling actually *conserve* energy. Current national recycling conserves the equivalent of 11.9 billion gallons of gas annually.

## Safe Non-incineration Alternatives for Medical Waste and Pollution Prevention

We encourage the use of safer, non-incineration technologies such as sterilization where facilities are properly regulated and well-operated. Pollution prevention, including the use of non-toxic alternatives to PVC plastics and mercury-containing devices, is also essential.

## ZERO WASTE

Escape the "bury or burn" trap. Please join us in moving towards Zero Waste.

Through implementing zero waste practices both upstream (including reducing consumption, product redesign, clean industrial production and processes, reducing packaging waste, encouraging refillable containers, and toxics use reduction) and downstream (including reuse, composting, recycling, and materials recovery), many countries, cities and businesses are making significant progress towards zero waste.

### Proven approaches that work: prevent waste and increase recycling and composting

- Zero Waste **creates jobs** and is good for the economy. For example, U.S. recycling and reuse establishments employ 1.1 million people and gross \$236 billion in annual revenues. Designing more recyclable, reusable and repairable products means more jobs for a vital industry.
- Zero Waste **saves natural resources** by reducing consumption and making new items from recycled materials. Ruining materials through thermal and combustion processes means more materials need to be extracted from the earth to replace those resources.
- Zero Waste **conserves energy** through reducing demand for extraction and processing of raw materials, which is energy intensive. EPA analysis shows that recycling is more energy efficient than combustion.

For more information about zero waste approaches:

GrassRoots Recycling Network, [www.grn.org](http://www.grn.org)  
Institute for Local Self-Reliance, [www.ilsr.org](http://www.ilsr.org)

Clean Production Action, [www.cleanproduction.org](http://www.cleanproduction.org)  
Eco-Cycle, [www.ecocycle.org](http://www.ecocycle.org)