

# THE MORALS OF WASTE-TO-ENERGY TECHNOLOGIES

Peak oil and our need to maintain our current lifestyle has made creativity a necessity. Our garbage may provide the answer. Through methods of incineration and waste gasification, the potential energy in our garbage is utilized to create electricity and transportation fuel. These methods also address the environmental burden our level of consumption has on our health and the health of the environment. However, the fact that it fits into the pre-existing grid is worrisome, as it sustains our current levels of unfettered consumption, and our disregard for our interdependence with the environment. Therefore, while using waste-to-energy techniques may be better than using virgin oil resources, this option is not the most sustainable for our future.



The Great Pacific Garbage Dump, a “plastic trash vortex” stretching 500 nautical miles across the Atlantic, has become one of the most powerful visual representations of the relationship between consumption and the environment. The plastics have led to the death of millions of seabirds and over 100,000 marine animals every year, who mistake syringes, cigarette lighters, and toothbrushes as food (Berg et al. 2011). Not only are animals affected, but the plastics also act as chemical sponges absorbing DDT and other hydrocarbons, which enter the food chain and pose serious health concerns for humans (Berg et al. 2011).

Garbage disposal has become an increasing concern and as led to the replacement of traditional methods of open dumps by sanitary landfills. This method involves compacting the waste and burying it in small refuse cells under a shallow layer of soil. The refuse cells are lined to prevent contamination of local surface and groundwater from nutrients and leachates (Young 2010). While this new design corrects many of the initial environmental and health concerns over open dumps, few are ideal; many have reached capacity, leachate is still able to penetrate surface and groundwater through cracks in the lining, and pockets of methane pose safety risks (Berg et al. 2011). These concerns as well as the incompatibility of landfills with principles of sustainable nutrient recycling have led many to investigate different ways of reducing waste.

Increasing awareness of the dangers human waste generates has inspired many to offer solutions to reduce the volume of garbage we produce. Many advocate incineration as a method to reduce the volume by 90 percent, and generate energy simultaneously (Berg et al. 2011). Waste-to-energy incinerators produce substantially less carbon dioxide than power plants that burn fossil fuels. This solution has been embraced worldwide, especially in Japan, where 75 percent of the garbage is incinerated (Berg et al. 2011). However, this method is not without flaws. Incineration produces carbon monoxide, particulates, and mercury. Fly ash is another product of the combustion and must be properly disposed of, as it contains toxic materials, like heavy metals and dioxins (Berg et al. 2011). Dioxins are particularly dangerous and exposure can lead to reproductive and developmental problems, damage to the immune systems, interfere with hormones, and lead to cancer (World Health Organization 2010). They bioaccumulate well in fatty tissue and therefore readily enter our food supply.

Waste gasification is a superior method to traditional incineration in terms of environmental impacts. The only output is water, and although it is not clean enough to drink, it can be used for irrigation (Kroh 2008). In addition, because gasification occurs anaerobically there is no potential for the waste to ignite, and therefore the production of dioxins and furan is eliminated (Bullis 2009).

Waste gasification is a process used to convert garbage into fuel and electricity. Also known as pyrolysis, waste gasification involves the thermal decomposition of carbon-based materials in an oxygen-deficient atmosphere to produce syngas (Young 2010). Syngas is a mixture of hydrogen and carbon monoxide that can be burned in gas turbines to produce electricity (Bullis 2009). In addition, an organism can be introduced to convert the carbon monoxide into ethanol. A second method can also be used to process waste into ethanol. Weak-acid hydrolysis isolates materials high in cellulose and places them in a long, narrow chamber 2,000 feet deep (Kroh 2008). The depth of this chamber creates enough gravity and pressure to heat the material to around 540 degrees Fahrenheit (Kroh 2008). After the material has been heated, oxygen and weak acid are introduced to break down the cellulose into glucose. The glucose naturally rises to the top and therefore is easy to collect and ferment to create ethanol. Waste gasification offers a way to deal with the excessive amounts of waste produced world wide – particularly in North America, where each individual produces an average 4.5 pounds of garbage each day – while also reducing foreign dependence on oil (Kroh 2008).

Incineration and waste gasification may prevent other ocean garbage dumps from being formed or growing larger, and prevent contamination of groundwater and surface water from leachate and other toxic materials.

Other benefits include the reduction of volume, which allows arable land to be used for other purposes besides landfills.

Waste gasification and incineration are indigenous solutions that are marketed as an alternative to the excessive use of fossil fuels used to transport garbage, sometimes across oceans. Currently, the majority of the world's electronic waste finds its way to places like Guiya China (Berg et al. 2011). The electronics are burned and dumped into acid to expose the precious metals exposed inside, which are used to support the local communities. The remaining materials are disposed of in local rivers. The consequences of our consumerist tendencies and habit to replace rather than fix has been transported to other countries that are forced to deal with the health impacts of our unsustainable lifestyles. Waste gasification and incineration would be a solution to this aspect of the problem.

However, the problem of waste production and consumption of virgin resources is not adequately addressed. Incineration and waste gasification frame the problem as the physical presence of garbage and therefore solve the consequence, not the actual conflict. This environmental problem has its root causes in our consumerist culture, the over packaging, the tendency to throw out something that is broken and replace it rather than fix it.

These behaviors must be challenged but if waste gasification is marketed as a domestic solution to both high oil prices and a way to mitigate the hazards of waste, then these behaviors will not change.

If waste is being used to generate electricity and transport fuel, than what incentive do consumers have to reduce their affluent lifestyle and embrace more holistic waste management systems? By setting up the system to run off of our waste we may benefit the environment by reducing the amount of land, water, and air pollution, but we do nothing to challenge the root of the problem. A true reduction in waste would bring a necessary awareness and agency to consumers. Being able to “reduce, reuse, recycle” are the three main avenues individuals are given to contribute to a sustainable future. By eliminating the necessity of the 3 R’s, we remove all individual accountability. Habits are not challenged, and in fact environmentally degrading habits are rewarded, as they generate more energy; the very energy that is used to create more waste. While this vicious cycle may use less virgin resources, it sustains the lifestyle and sense of entitlement that enables further exploitation of other resources. The fuel that we are putting in our vehicles may be recycled ethanol, but we still buy the new car. Our recycled fuel cannot be used to morally offset the energy that goes into the car manufacturing. In the same way, the “clean” electricity generated through this process cannot justify the construction of Mc-mansions that are powered off this energy.

Although it is unlikely that garbage would replace oil as the world's primary geopolitical concern, or that recyclables would be banned in an effort to create more waste, we must critically evaluate the message that rewarding waste production enforces. However, the other side of the argument must also be considered. While using waste as an energy source creates a lack of incentive to reduce waste, we must also ask ourselves, "is this okay?" Strategies in Hamilton to limit each house to one bag of garbage, while good in theory, lead many to engage in "midnight dumping". The same is also true in areas that tax garbage production. Citizens' lack of response to these incentives suggests that maybe they cannot be relied on to change their consumerist habits. If we lack the will regardless, is it not better to at least fix one environmental problem? At what point do governments have the right to take away our agency? If we are not exercising it anyways, will we notice? Whether we want to take this responsibility or not, eventually we have to realize that we are global citizens. Therefore our reduction of garbage cannot be for the sole purpose of creating more exploitable resources, but must come from a more holistic understanding of our environment.

By embracing incineration and gasification, we are blinded to the fact that there is a much simpler, more sustainable answer. We need to embrace all opportunities to reuse, pressure corporations into using less packaging, and control our energy use.

This will be difficult, due to the temptation of waste gasification that produces one of the world's most valued commodities – energy. However, we must recognize the spiral we will be pulled into if we start to condone waste production in order to sustain the already environmentally degrading fossil fuel system. We need to challenge our capitalist psyche and reconnect with a sustainable vision of the future rather than technological fixes. Waste gasification may be a promising idea to deal with pre-existing garbage, but other sources of energy that do not rely on the production of waste, need to be explored for long-term use.

Source: <http://www.sassweb.ca/3bb3/uncategorized/the-morals-of-waste-to-energy-technologies>