

Solutions for a Sustainable Future

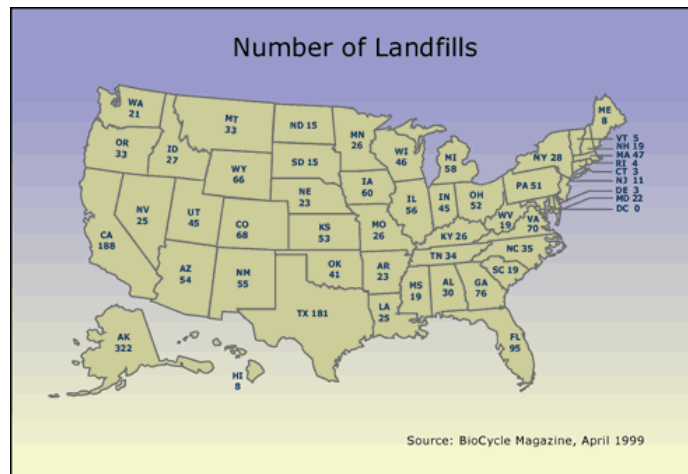
Biodegradable products may be bad for the environment

I purchased biodegradable products for our Memorial Day Picnic this year. They were more money, but I wanted to do my part. Someone at the cookout said I was doing more harm than good. Is that true? J.P., Medina.



Researchers from North Carolina University have shown that so-called biodegradable products are likely doing more harm than good in landfills, because they are releasing a powerful greenhouse gas as they break down. Biodegradable materials, such as disposable cups and utensils, are broken down in landfills by microorganisms that then produce methane. Methane can be a valuable energy source when captured, but is a potent greenhouse gas when released into the atmosphere.

Factoid: The U.S. has 3,091 active landfills and over 10,000 old municipal landfills, according to the Environmental Protection Agency. And the U.S. Environmental Protection Agency (EPA) estimates that only about 35 percent of municipal solid waste goes to landfills that capture methane for energy use. Another 34 percent of landfills capture methane and burn it off on-site, while 31 percent allow the methane to escape.



The problem with biodegradable products is methane. Biodegradation is the process where microorganisms break down organic substances as a source of energy. Methane is a byproduct of this process. While not seen in high concentrations as carbon dioxide, methane is a more potent greenhouse gas.

Methane is the major component of natural gas, about 87% by volume. At room temperature and standard pressure, methane is a colorless, odorless gas; the smell characteristic of natural gas as used in homes is an artificial safety measure caused by the addition of an odorant. Methane as a gas it is flammable only over a narrow range of concentrations (5–15%) in air. Methane is created near the Earth's surface, primarily in soils, rivers/seas and in animal innards. It is carried into the stratosphere by rising air in the tropics. Uncontrolled build-up of methane in the atmosphere is naturally by methane's reaction with hydroxyl radicals formed from singlet oxygen atoms and with water vapor.

Factoid: A small amount of odorant (t-butyl mercaptan), with an odor that is associated with natural gas, and has been described as a rotten egg odor, is added to the otherwise colorless and almost odorless gas used by consumers, to assist in detecting leaks before a fire or explosion occurs. Adding odorant to natural gas began in the United States after the 1937 New London School explosion. The buildup of gas in the school went unnoticed, killing three hundred students and faculty when it ignited.

Methane in the Earth's atmosphere is an important greenhouse gas. This means that a methane emission will have 25 times the impact on temperature of a carbon dioxide emission of the same mass over the following 100 years. Methane has a large effect for a brief period (a net lifetime of 8.4 years in the atmosphere), whereas carbon dioxide has a small effect for a long period (over 100 years). The Earth's atmospheric methane concentration has increased by about 150% since 1750, and it accounts for 20% of the total radiative forcing from all of the long-lived and globally mixed greenhouse gases.

Factoid: It is estimated that there are also about 900 trillion cubic meters of "unconventional" gas such as shale gas, of which 180 trillion may be recoverable

Man made Biodegradable products break down much more rapidly than regular trash sent to landfills. This alone is a good thing, and what was intended by the biodegradable product manufacturers and wanted by consumers who are trying to use greener products. But the landfills that collect methane don't begin collection for at least two years after waste has been buried. With biodegradable products breaking down in less than two years, the result is much of that methane gas escaping into the atmosphere.

Factoid: Methane is emitted from a variety of both human-related and natural sources. Human-related activities include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. It is estimated that more than 50 percent of global methane emissions are related to human-related activities (U.S. EPA). Landfills are the third-largest human-related source of methane in the U.S., accounting for 17 percent of all methane emissions.

The North Carolina study found that the more sustainable approach would be to modify biodegradable products so that they break down slower. Products would still break down far quicker than standard solid waste, but it would allow time for landfills to install gas collection systems and thereby prevent methane from escaping into the atmosphere.

In other words biodegradable products are not necessarily more environmentally friendly when disposed in landfills and yes your “so called” family picnic is destroying our world. I hope you feel good about yourself J.P.

I am Jim Steigner (Mr. Comfort), and I just wanted you to know. As always please feel free to contact me at www.mrcomforthvac.com, under the “Ask Mr. Comfort” Section, with any thoughts, questions, or ideas.