

Incineration of HDPE in Municipal Waste Facilities

The high density polyethylene (HDPE) used in the production of NOAXE reusable bags is made from a natural gas feed stock. It is a hydrocarbon consisting primarily of oxygen, hydrogen, and carbon.

HDPE is considered one of the safest plastics because it is very non-reactive.¹ According to the EPA, it burns into carbon dioxide and water vapor, and leaves no toxic waste. Any film additives also become simple oxides, just like HDPE.² Generally speaking, the CO₂ production from HDPE incineration is considered minor as it partially offsets CO₂ production of fuel oil plants.³ The consumption of crude oil, natural gas, and pit coal, normally used in district heating plants can be substantially lowered by the incineration of plastic waste.⁴

According to the EPA, some plastics may emit nitrous oxide with incomplete combustion, however, since HDPE doesn't contain nitrogen, there are no NO₂ emissions.⁵

HDPE usually has a higher energy value than other materials commonly found in the waste stream and fewer pollutants. Pound for pound it generates about twice the energy as Wyoming coal and almost as much energy as fuel oil.⁶ When processed in modern waste-to-energy facilities, the HDPE helps other waste materials combust more completely, leaving less ash for disposal in landfills.

<i>Energy Values</i>	
Material	Btu/pound
PET	10,900
HDPE	18,700
Other Plastic Containers	16,400
Other Plastics	17,900
Rubber & Leather	12,800
Newspaper	8,000
Corrugated Boxes (paper)	7,000
Textiles	9,400
Wood	7,300
Average for MSW	5,900
Food and yard Wastes	2,900
Fuel Oil	20,900
Wyoming Coal	9,600

Energy produced by incineration of HDPE is better than burning conventional fossil fuels for utilities. For example, HDPE emits 2.79 MTCO₂E/Short Ton during the combustion process. By conducting this process and avoiding utility emissions, 1.51 MTCO₂E/Short Ton is saved.⁷

The question may arise, “how does it compare to paper bags?” It is commonly known that burning paper and wood products is banned in most regions of the US due to its significant pollution. The various types of pollution and residue include substantial ash, and other related pollutants and possible toxins, for example, it has been associated with the release of dioxin.

In conclusion, no reports were found identifying toxic releases from incineration of HDPE.

¹ Identifying Poisonous Plastics. The Health Wyze Report. 2015.

<http://healthwyze.org/index.php/component/content/article/49-identifying-poisonous-plastics.html>

² Leonard Cribbs, PhD, retired Lyondell/Bassell resin scientist, 4-20-15 interview.

³ EPA report Plastic, Chapter 10, Exhibit 16. CO₂ emissions are offset by about 54%. This offset takes into consideration costs to manufacture and transport the polyethylene to users and subsequently to the incineration facility. 2011.

⁴ Plastic Films in Food Packaging: Materials, Technology and Applications, Sina Ebnesajjad, 1999, page 255, Sec. 14.4. PDL

⁵ [Plastics](#): Environmental Protection Agency. Chapter 10. PDF

⁶ When purchased at low prices, this explains why dirty recycled HDPE is sought after overseas to burn in energy producing plants. The low per pound cost is less than fuel oil and burns cleaner.

⁷ [Plastics](#): Environmental Protection Agency. Chapter 10. PDF