



Environmental Impacts of Technology

Plastics

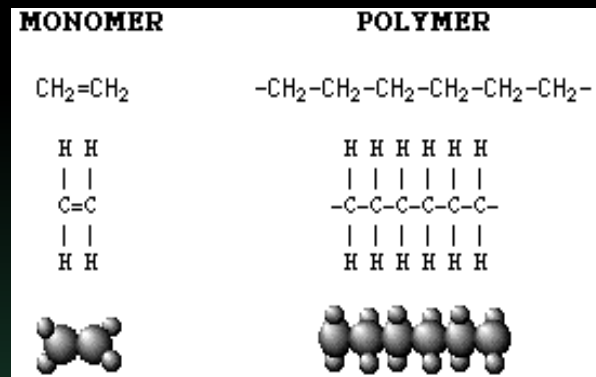


Image Source:
Michael Coghlan

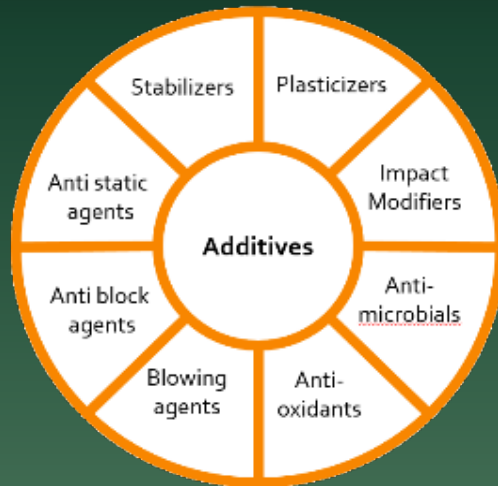
Disposal & Degradation

Plastics

Environmental Impact



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Manufacturing



Use



Disposal

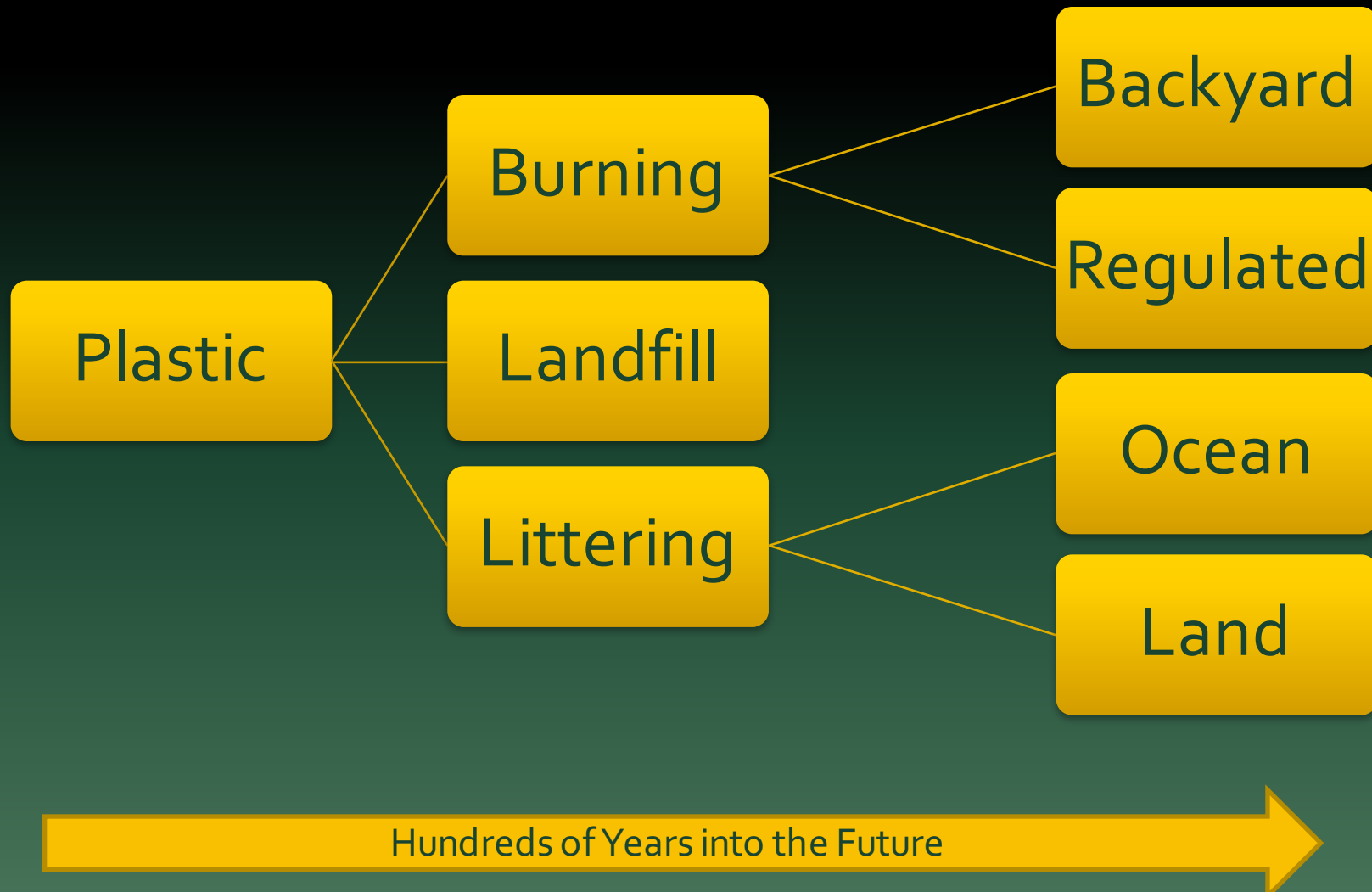


Degradation



Migration

Environmental Impacts of *Disposal & Degradation of Plastics*



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Burning

Backyard

- Backyard burning occurs at relatively low temperatures which releases many toxic fumes into the air.
 - Dioxins
 - Furans
 - PCBs (polychlorinated biphenyls)
 - mercury
 - styrene gas
- Many of these pollutants **persist** for a long time in the air and in the body.
- Dioxins and furans are two of the most toxic classes of compounds on the planet.



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Plastic

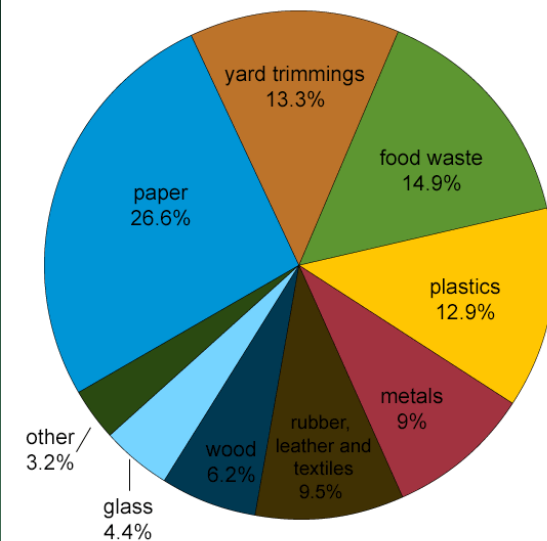
Burning

Regulated

Plastics that are burned in properly constructed MSW (municipal solid waste) incinerators reach such high temperatures that toxic releases of chemicals are avoided, or managed by flues.

About 13% of the over 250 tons of Municipal Solid Waste generated in the U.S. every year is burned for energy, including many plastics.

Total MSW generation in the United States by type of waste, 2014
Total = 258 million tons



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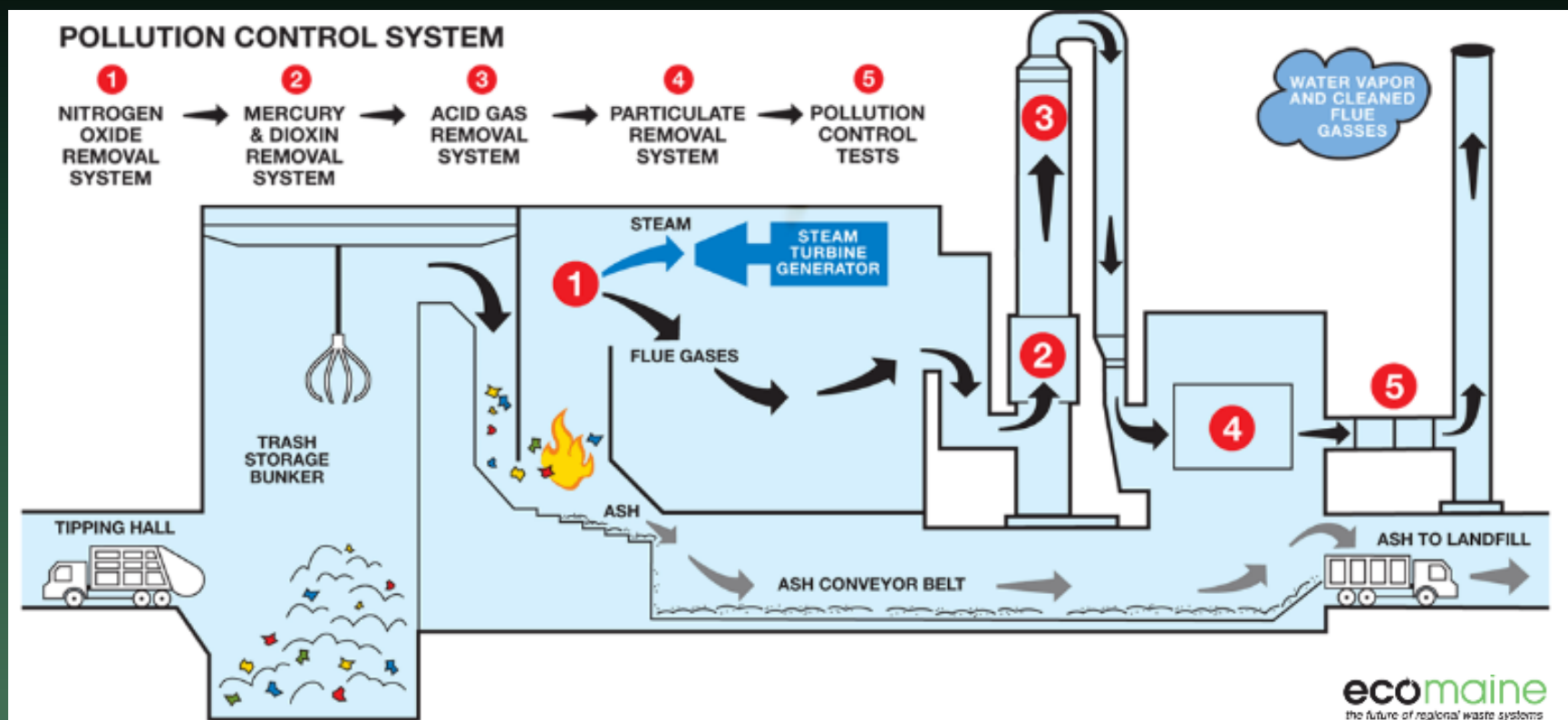
Source: U.S. Environmental Protection Agency, Advancing Sustainable Materials Management: 2014 Fact Sheet, November 2016

Environmental Impacts of *Disposal & Degradation of Plastics*

Plastic

Burning

Regulated



Environmental Impacts of *Disposal & Degradation of Plastics*

Plastic

Landfill



About 63 pounds of plastic per person in the U.S. ends up in a landfill every year. By its very nature, plastic does not biodegrade. In a landfill, most plastic is not exposed to enough light to photodegrade, so it mummifies and can take up to 1,000 years to decompose. In the meantime, many plastics (including PET and HDPE bottles) have been shown to contribute toxins to landfill leachate.

Environmental Impacts of *Disposal & Degradation of Plastics*



Of all the possible ways to dispose of plastics, littering is likely the worst - it releases plastics to land and ocean which subsequently degrade into smaller and smaller particles that permeate the planet.

Did you know?

Plastics do not biodegrade into other substances; they photodegrade (become brittle and break down into smaller pieces upon exposure to light).



Environmental Impacts of *Disposal & Degradation of Plastics*



Over ten million tons of plastic ends up in the world's oceans every year, much of it carried by water and wind from coastal areas and land. Although plastics in the oceans have been studied extensively, terrestrial plastic (e.g. on land) has not been well studied and little is known about how much plastic remains on land (and not in landfills) or about the resulting impacts on terrestrial ecosystems. Unlike in landfills, plastics in oceans and land are exposed to considerable light which causes them to photodegrade faster, break down into smaller particles faster, and therefore, migrate far further than plastics in landfills.



Environmental Impacts of *Plastics Disposal and Degradation*

Plastics were designed to last a long time but have for decades been used in products that are now being treated as disposable. The result is millions and millions of tons of plastic waste in landfills, oceans, and land that will take hundreds of years to decompose. In the meantime, plastics break down into smaller and smaller particles, permeating ecosystems on land and in water everywhere.



While the best choice is to consume less plastic, any plastic disposed of should go to a landfill.



Reducing *Environmental Impacts*

