

Green Enough

Module 1.3 Plastic Pollution

Green Enough: Educational program to raise ecological behaviour through an inclusive methodology using Augmented Reality Technology

2022-1-EL01-KA220-ADU-000086368

Module 1.3: Learning Objectives

By the end of this module trainees will be able to:

- Demonstrate the ability to understand the main causes of plastic pollution (LO5)
- Demonstrate the ability to understand the main impacts of plastic pollution (LO6)

Learning Outcomes	Knowledge	Skills	Competences
LO5: Demonstrate the ability to understand the main causes of plastic pollution	Name the most common plastic products contributing to plastic pollution	Identify incidents of plastic waste mismanagement	Distinguish between sensible and careless use of plastic products
LO6: Demonstrate the ability to understand the main impacts of plastic pollution	Define the main issues caused by plastic pollution	Identify incidents where plastic pollution occurs	Evaluate how plastic pollution contributes to marine litter

1.3.1 What are plastics?



- **Synthetic** materials, mostly **made of fossil fuels**.
- Flexible, rigid, elastic, soft or hard.
- **Additives** give plastics the characteristics required for their intended use



PET



Polyethylene



PVC



Nylon



Flexible



Elastic

- pliable & easily shaped
- now synonymous to polymers (of many parts)
- made of long chains of molecules

A brief history of plastics



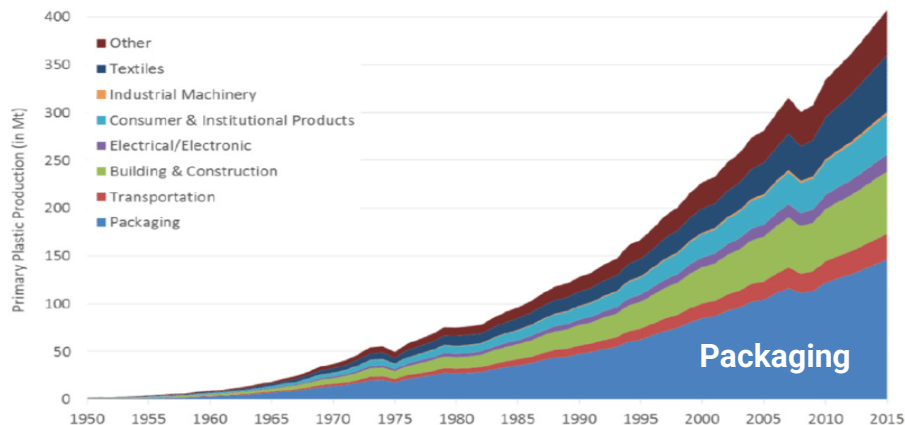
Scan to watch

Largest market for plastics?

Figure 1

Global primary plastics production according to industrial use sector from 1950 to 2015 (million metric tons)

Source: US Department of Agriculture, <https://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us.aspx>

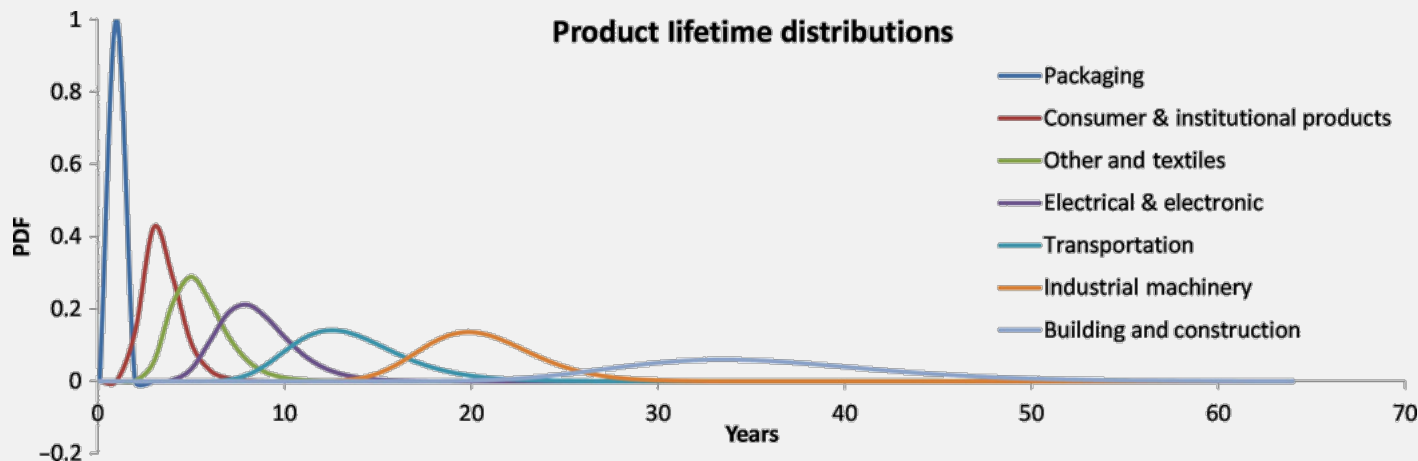


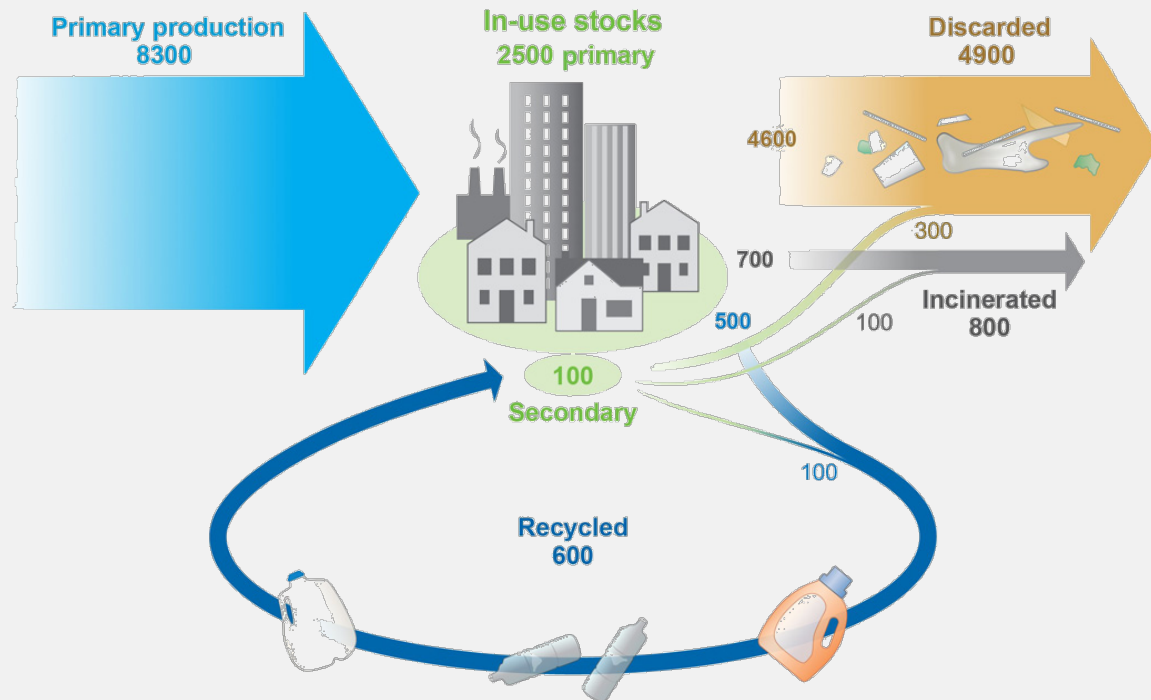
Global primary plastics production according to industrial use sector from 1950 to 2015 (Mt)

For how long are they used?

Plastic products are very short lived

Inefficient use of plastics





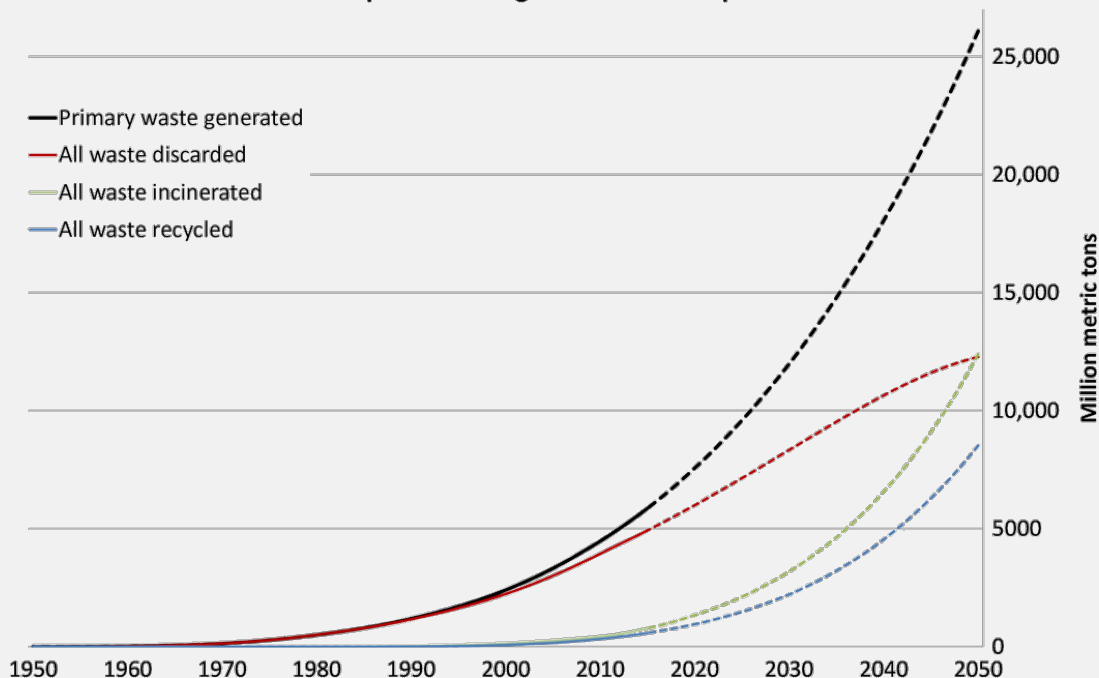
Plastics used & managed inefficiently

- ~8300 Mt plastics produced
- ~30% remain in use
- ONLY 9% recycled, of which, only 10% have been recycled more than once
- ~12% incinerated
- ~79% in landfills or natural environment

Global production, use, and fate of polymer resins, synthetic fibres, and additives (1950 to 2015; Metric tons)

Global plastic waste production & management projection to 2050

Cumulative plastic waste generation and disposal



Plastic waste:

Discarded in landfills or natural environment > recycled

Incinerated > recycled

1.3.2 Plastic Waste Pollution



1.3.3 Impacts of Plastic Terrestrial Pollution



Lightweight plastic
waste easily
transferred via
wind & rain

Transported around the
terrestrial environment

Often ends up
in marine
environment (via
rivers, rainwater
drains)

Uncontrolled Dumps and Landfills



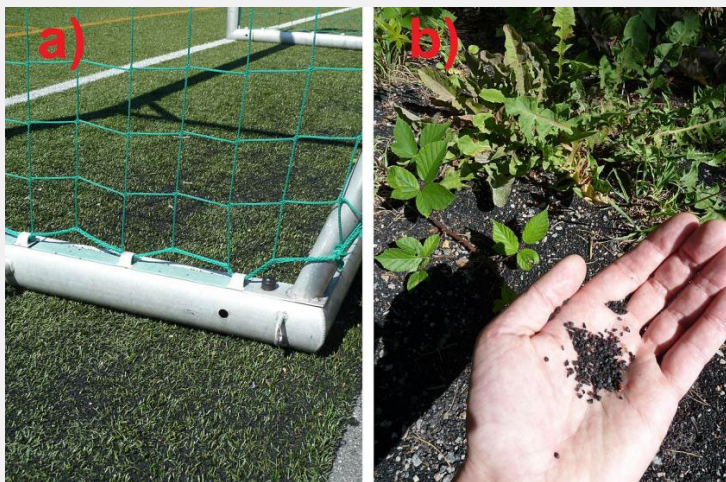
Landfills not engineered to properly contain waste result in **waste-leakages** to:

- the soil
- aquifers
- air (due to emissions)

Less thought of, sources of plastic terrestrial pollution

Synthetic football turfs & tire abrasion

Plastic particles carried/washed away by rain enter soils and release microplastics in the environment.



Sewage Sludge (often applied to fields as fertilizer)

Microplastics enter sewage through washing machines, sanitary waste, etc.



Plastic Marine Pollution

Plastic pollution is one type of marine litter.

In the following module, we will take deeper dive into:

- What is Marine Litter?
- What are the main sources of marine litter?
- What are the impacts of marine litter?
- What can you do about it?



References

- Islam, S. & Sloan, John & Dogan, Berna & Scelta, Gabe. (2019). Frontier Technology Quarterly, September 2019: Frontier technologies for addressing plastic pollution. 1. [https://www.researchgate.net/publication/336073612 Frontier Technology Quarterly September 2019 Frontier technologies for addressing plastic pollution](https://www.researchgate.net/publication/336073612_Frontier_Technology_Quarterly_September_2019_Frontier_technologies_for_addressing_plastic_pollution)
- UN Environment Program, 'Plastic planet: How tiny plastic particles are polluting our soil', December 2021, <https://bit.ly/3SXAHAq>

Thank you!