

Many INC delegates indicated that the scope of the treaty should include plastics alternatives and substitutes.

However, there are no internationally agreed definitions of plastics alternatives nor plastics substitutes. Sound definitions will support fully informed treaty negotiations.

International agreements emphasize the need to promote the human health, environmental, economic, and social risks, costs, and implications of alternative substances (e.g., Art. 9 Stockholm Convention¹; see also Art. 1 Convention). International legal instruments also note that when considering substitutes, the potential environmental benefits or penalties of substitute materials or activities (i.e., negative externalities) must be considered.

The United Nations Conference on Trade and Development (UNCTAD) has developed the following plastics alternatives and substitutes definitions:

Plastics Alternatives are plastics not made with conventional fossil-fuel based polymers² (i.e., bioplastics³).

Plastics Substitutes are all other non-plastic materials that may be used to replace synthetic fossil fuel-based polymers and bioplastics. Some examples are glass, leather, wood, silk, paper, cotton, wool, stone, ceramic, and aluminum.



A simple and easy way to distinguish between these two categories is as follows:

- Plastics alternatives = 'better polymers'
- Plastics substitutes = 'non-plastic' materials

¹Art. 1. (4) Convention for the Protection of the Ozone Layer defines 'alternative substances' as those which reduce, eliminate, or avoid adverse effect to the ozone layer.

See Plantic 101 for the set.



The distinction between plastic substitutes and plastic alternatives

Plastics substitutes are natural materials that have similar properties to plastics, while plastic alternatives include bioplastics or biodegradable plastics.

Plastic substitutes

vs

Plastic alternatives

Mineral, plant, marine or animal

ORIG

Bioplastics or Biodegradable plastics

Recyclable, reusable, biodegradable, compostable, or erodable

PROPERTIES

Recyclable, biodegradable, or compostable (end of life)

Should have lower environmental impact along their life cycle

IMPACT

Should have lower GHG lifecycle emissions when compared to plastics

Should not be harzardous for human, animal or plant life

SAFETY

Should not be harzardous for human, animal or plant life

Non-plastics

Better plastics

Source: UNCTAD Vivas Eugui & Pacini (2022). UNCTAD, based on presentation on plastic substitutes HS codes, Life-cycle analysis and tariffs considerations. WTO Dialogue on Plastics.

Substitute Products

Plastics Alternatives and Substitutes can be applied to materials but exclude final whole products. This is a problem because product substitutes may contain biopolymers and fossil fuel-based polymer components.

For example, bamboo cups marketed as 'eco-friendly' were found to contain toxic plastic melamine-formaldehyde resin used to hold the bamboo fibers together into a cup shape. Toxic formaldehyde can migrate from the resin into hot beverages. The cups were not biodegradable, compostable, nor recyclable as the company claimed and they would eventually end up in landfills or incinerators⁴.

The main material of a substitute product may also be non-plastic such as new and recycled paper and board food contact materials but still contain toxic substances including some per- and polyfluoroakyl substances (PFAS), organophophate esters (OPEs), and plasticizers⁵.



Safety, Sustainability, Essentiality, and Traceability Criteria for Plastic Alternatives and Substitutes

When considering alternatives and substitutes, delegates may consider the need to assess alternative polymers and substitute materials, products, and approaches against the following set of criteria. These criteria should be grounded in the prevention and precautionary principles and guided by a toxic-free zero-waste hierarchy. These criteria will need to be developed by an independent body of experts including independent scientists, Indigenous rights holders, and community experts.



 $Source: Safer\ Circular\ Economy\ Fact\ Sheet\ https://library.sprep.org/content/safer-circular-economy-plastics-pacific-region$

Zimmermann 2023: https://www.foodpackagingforum.org/news/studies-assess-pfas-opes-and-plasticizers-in-paper-boardis:"rtext=PFAS%20are%20widely%20used%20in(FPF% oreportes%20and%20here). Cousins et al 2021, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8372848/#:"rtext=To%20assess%20the%20essentiality%20of,3)%20if%20the%20function%20is

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Is it safe? For example, is the polymer or final product toxic or otherwise hazardous in any ecosystem, or to humans, wildlife, and other organisms regardless of intended use and disposal?

Is it sustainable? For example, was the polymer or final product designed for regenerative and restorative circularity, non-toxicity, safe reuse/refill, repair, remanufacture, durability, high standards of biodegradability or compostability? Were the materials grown, harvested, extracted, or otherwise acquired sustainably and equitably?

Is it essential? Is the function of the alternative polymer or substitute material or product critical for the health, safety, and functioning of society⁶? If not, for example, a substitute simply replacing one single-use application for another may be a case for prohibition or restriction of the item.

Is the information transparent and traceable? Is the polymer, material, or product clearly labelled including information about content, safe use, and responsible disposal? Is it traceable/trackable throughout the supply chain?



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