GO!PHA
Global Organization for PHA

UN ZERO DRAFT FOR A GLOBAL PLASTICS TREATY

GO!PHA POSITION STATEMENT

About Us

Foundation **GO!**PHA is a member-driven, non-profit initiative promoting the use of renewable carbon-based and sustainable materials to help transition to a circular economy

Renewable, biodegradable, and compostable materials provide a unique opportunity to reduce greenhouse gases and environmental plastic pollution while establishing circularity in materials used by offering sustainable, functional, and natural materials that are renewable and offer diverse end-of-life options.

GO!PHA provides a platform for creating and sharing experiences and knowledge and facilitates joint development initiatives using these natural, unique, and innovative materials.

We commend UNEP for laying a robust groundwork for a the Global Plastics Treaty through the Zero Draft. **GO!**PHA believes that more needs to be done to explore the benefits of suitable sustitutes to plastics, and promote and transition towards circular and sustainable materials that can replace fossil and persistent plastics.

Our recommendations

1. Create an independent expert body for science and policy interaction
2. Encourage recycling and reuse via design, waste collection, and infrastructure improvements
3. Establish stricter measures to address the dangers of microplastics
4. Promote innovation to minimise harm to the environment and human health
5. Create mechanisms for research, development, and the transfer of knowledge and technology

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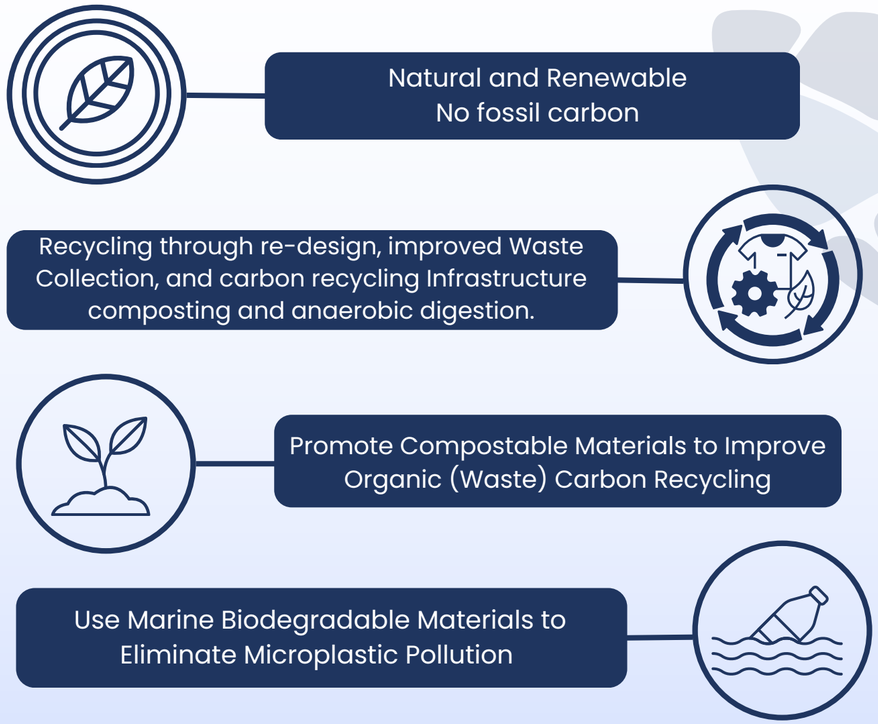
Moving away from plastics and their negative effects requires a major interdisciplinary and holistic strategy that emphasises innovation in enabling truly circular alternatives. The recently published Ellen MacArthur UNEP report [1] that emphasises the RRC (Re-use, Recycle, and Compostable) benchmark indicates that the 2025 goals in these areas would be missed, with the "Compostable" mandate being significantly underutilised.

To achieve the goal of reducing and ultimately eliminating the production and use of harmful plastics worldwide, it is essential to adopt renewable, biodegradable, and compostable materials to achieve true circularity and sustainability. The last 40 years have seen considerable advancements in research and development, and manufacturing and use, that have demonstrated the functional and environmental advantages of renewable, biodegradable, and compostable materials compared to fossil-based plastics. Therefore, we believe that the UN Plastics Treaty should mandate that member countries must take concrete and actionable steps to promote the rapid development and deployment of materials and chemicals that meet all of the following four criteria: being renewable, recyclable, compostable, and free from persistent microplastics, outlined in our INC-2 position paper and they are:



Following the above four defining principles, GO!PHA urges the UNEP to enact our suggestions on alternatives and substitutes in the next version of the treaty document.

1 Create an independent expert body for science and policy interaction

To ensure the treaty benefits from comprehensive research and expertise to address the multifaceted challenges of plastic pollution and enhance transparency in negotiations, a specific independent expert body with interdisciplinary strengths must be established for this purpose.

By establishing a common knowledge foundation and promoting mutual understanding among nations, this body can participate in crafting targets, assessment criteria, and the development of sustainable labels and standards.

Additionally, the independent body must provide expertise in advancing innovative materials, technologies, and practices, along with the essential technical knowledge needed to address challenges related to ambiguous concepts and standardisation mechanisms. This expert body should:

a. Provide consistent definitions, standards, certifications, and labelling requirements

The intricate web of concepts, sources, and definitions adapted to suit a specific scope, purpose, and the particulars of rulemaking can be challenging in consistently formulating an accurate and current scientific background. An independent expert body must establish definitions, standards, and labelling requirements for problematic plastics and products, as well as what are considered safe and environmentally sound plastic alternatives and non-plastic substitutes specific to the treaty. The definitions and standards should follow international rules, be scientifically backed, and unambiguous, and promote in

b. Identify Suitable Alternatives and Substitutes for Appropriate Applications

As much research and best practices across the globe already indicate, many natural materials like wood, cellulose, proteins, starch, and natural PHA, can serve as substitutes for traditional fossil-based materials. The principles of circularity necessitate materials that align with the waste management hierarchy – suitable substitutes are renewable, recyclable, reusable, compostable, and biodegradable, and if they were to leak they biodegrade in the marine environment, freshwater, and soil without releasing persistent microplastics. The treaty must recognize and highlight the good practices applications, and examples of renewable resources to enhance the shift away from problematic plastics. While encouraging research and investment into the development of suitable alternatives substitutes and technologies is paramount, the treaty should also establish standards and definitions for assessing their safety, and environmental performance.

2 Encourage recycling and reuse via design, waste collection, and infrastucture improvements

Materials and products need to be designed for increased collection and recycling through improved waste management systems and consumer awareness and education. This needs to be encouraged through ambitious targets in this treaty. The treaty should also establish targets to encourage member nations to restructure and enhance their waste management infrastructure, specifically focusing on expanding composting and anaerobic digestion capacity. Encouraging composting and anaerobic digestion supports the transition to a circular economy by reducing waste and maximising the utility of organic materials. These processes can recover valuable resources from organic waste, such as compost and biogas, which can be used to enrich the soil and generate renewable energy. This also aligns with sustainability goals by optimising resource utilisation. By setting specific targets, the treaty would allow member nations to adopt sustainable waste management practices and ensure accountability in their efforts to address plastic pollution.

The treaty must ensure transparency and consider the on-ground realities of all measures it proposes. The limits of plastic recycling must be acknowledged, particularly in regions with limited recycling infrastructure, as these conditions might discourage countries from participating in the treaty and actively contributing to the solution.

3 Establish stricter measures to address the dangers of microplastics

While the current focus is primarily on intentionally added microplastics, it's also essential to address the issue of microplastics released unintentionally from plastic products. Additionally, it's essential to emphasize that recycling processes frequently overlook microplastics. The treaty text focuses primarily on waste management, neglecting two significant aspects: 1) the continued presence and release of microplastics in recycled plastics, and 2) the eventual release of microplastics as recycled plastic items degrade at the end of their lifespan. The dangers that come with plastics do not vanish, even in the best-case scenario when they are properly discarded or treated as per waste management rules. The consequences of plastic ingestion by living organisms, as it degrades into micro and nanoparticles, have been largely overlooked and underestimated.

4 Promote innovation to minimise harm to the environment and human health

It's important to discourage unnecessary packaging, pushing planetary boundaries, or littering when supporting the development and use of alternatives and substitutes to problematic plastics. For this reason, the development of clear standards, assessments, and systems for suitable alternatives and substitutes to scale up those innovative and truly circular technologies is essential while developing the treaty. It’s crucial to use recyclable materials as much as feasible in today’s society. However, materials that degrade in organic waste or in the natural environment, particularly in cases where recycling facilities are absent, insufficient, or where items are prone to littering could be considered.

5 Create mechanisms for research, development, and the transfer of knowledge and technology

While the treaty requires nations to safeguard the safety of alternative technologies and substitutes, it's important to recognize that many countries already possess these technologies. Establishing a platform for information exchange, knowledge sharing, and technology transfer would promote widespread access to these innovations.

How can suitable substitutes and alternatives to plastics contribute to the goals of the Global Treaty?

The significance of suitable substitute polymers is that they originate from natural processes within plants, animals, fungi, or bacteria during their production, which does not depend on fossil fuels. Moreover, at the end of their lifecycle, they exhibit biodegradability, and hence compostability without generating persistent microparticles during their biodegradation. Researchers and innovators globally have discovered, and successfully reproduced, the natural processes and features, such as biodegradability, compostability, and renewability for commercial applications.

When manufactured responsibly, adhering to safety and environmental guidelines, and when reused and recycled to the greatest extent, these materials can serve as environmentally sound and safe substitues to problematic plastics.

RENEWABLE & BIO-BASED

BIODEGRADABLE

BIOCOMPATIBLE

CIRCULARITY & END-OF-LIFE

WHAT SUITABLE SUBSTITUTES ARE	WHAT SUITABLE SUBSTITUTES ARE NOT
Natural and Renewable No fossil carbon	A license to litter
Compatible with circularity design - reusable, recyclable and compostable	A substitute for improper waste management
Biodegradable - in cases when recycling or reuse is not an option	A means to circumvent safe product development standards and regulations
Non-persistent in the environment Microplastics-free	An alternative to reducing superfluous products

About PHA [2-6]
Polyhydroxyalkanoate (PHA) biopolymers are a class of natural materials that have existed for over 2 billion years. Like other natural materials such as wood, cellulose, proteins, and starch, PHA is produced in nature and this natural process (fermentation) is being used to produce them commercially. Being a natural material, PHA is benign to living beings and is marine, freshwater, and soil biodegradable.

PHA is thermoplastic in nature having the attributes of 7 of the top-selling fossil plastics in the world. PHA is being used in many applications to successfully replace fossil plastics [5]. PHA can be recycled for reuse, they are home and industrially compostable, and if they were to leak, they biodegrade in the marine environment, freshwater, and soil. Therefore, PHA does not create microplastics and in some countries, they are even being used as animal feed.

[1] Ellen MacArthur Foundation UNEP Report
[2] Koller, Martin & Mukherjee, Anindya. (2020). Polyhydroxyalkanoates – Linking Properties, Applications and End-of-life Options. Chemical & biochemical engineering quarterly. https://doi.org/10.15255/CABEQ.2020.1819
[3] Mukherjee, Anindya & Koller, Martin. (2022). Polyhydroxyalkanoate (PHA) Biopolyesters - Emerging and Major Products of Industrial Biotechnology. The EuroBiotech Journal. https://doi.org/10.2478/ebtj-2022-0007
[4] Koller, Martin & Mukherjee, Anindya. (2023). Polyhydroxyalkanoate (PHA) Bio-polyesters – Circular Materials for Sustainable Development and Growth. Chemical and Biochemical Engineering Quarterly. https://doi.org/10.15255/CABEQ.2022.2124
[5] Koller, M., Mukherjee, A., Obruca, S., Zinn, M. (2022). Polyhydroxyalkanoates (PHA): Microbial Synthesis of Natural Polyesters. In: Rehm, B.H.A., Wibowo, D. (eds) Microbial Production of High-Value Products. Microbiology Monographs, vol 37. Springer, Cham. https://doi.org/10.1007/978-3-031-06600-9_8
[6] Koller, Martin & Mukherjee, Anindya. (2022). A New Wave of Industrialization of PHA Biopolyesters. Bioengineering. https://doi.org/10.3390/bioengineering9020074