GO!PHA
Oudebrugsteeg 9
1012 JN Amsterdam
The Netherlands

12324 Hampton Way
NC 27587 Wake Forest
United States

E-mail: gopha@gopha.org
Website: www.gopha.org

GO!PHA
Global Organization for PHA

GO!PHA position on "The United Nations Treaty on Plastics", and The INC-2, Paris, May 2023

Renewable and Circular alternatives exist to tackle plastic pollution:

The UN Environment Programme (UNEP) estimates that 85 percent of the single-use plastic products for food and beverage containers end up in landfills or as unregulated waste. [1] Despite numerous benefits, plastics pollution is causing adverse effects on the environment, society, and health. Therefore, it is imperative that we transition from fossil-based and persistent materials to sustainable and circular alternatives.

What does the move away from fossil-based and persistent plastics mean, and what happens to the existing pollution? Best practices, regulations, green infrastructure, and recycling are essential and remediating existing plastic pollution will require a wide variety of large-scale solutions and initiatives. We believe that combating plastic pollution requires a major interdisciplinary and holistic strategy that emphasizes innovation in enabling truly circular alternatives. The recently published Ellen MacArthur UNEP report[2] that emphasizes 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 underutilized.

To achieve the goal of reducing and ultimately eliminating the production and use of harmful plastics worldwide, it is essential to adopt biodegradable, compostable, and renewable materials that enable the creation of circular materials and products. 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.

GO!PHA and its members strongly advocate for the inclusion of renewable, biodegradable, and compostable materials as a viable alternative to fossil-based and persistent plastics in the UN Global Plastics Treaty.

---

1 United Nations Environment Programme: Visual Feature
2 Ellen MacArthur Foundation UNEP Report

GO!PHA
Oudebrugsteeg 9
1012 JN Amsterdam
The Netherlands

12324 Hampton Way
NC 27587 Wake Forest
United States

E-mail: gopha@gopha.org
Website: www.gopha.org

1. Use Renewable Carbon Feedstocks, **NOT Fossil Carbon**

   Using renewable materials is essential to transition away from fossil plastics. Products derived from renewable carbon feedstocks, coupled with environmentally friendly production techniques, eliminate the introduction of new (fossil) carbon into the environment. This is crucial in mitigating climate change, pollution, environmental degradation, and social vulnerabilities.

2. Recycling through Design, Waste Collection and Infrastructure, **"Recyclable" Is Insufficient**
   - Merely labeling materials as "recyclable" is insufficient. 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. Renewable biodegradable and compostable materials can be mechanically recycled when they reach substantial volumes.

3. Promote Compostable Materials to **Improve Organic (Waste) Carbon Recycling**
   - Biodegradable and compostable material bags can significantly increase organic waste collection, in addition to them being organically recycled to capture the carbon for reuse as a feedstock and as organic fertilizer, reducing chemical fertilizer use. Composting renewable materials adds no additional carbon to the environment and this must be mandated in this treaty with ambitious targets. Composting is essentially the recycling of carbon, and this fact should be recognized as 'Recycling".

4. Use Marine Biodegradable Materials to **Combat Microplastic Pollution**
   - "There are currently 75 to 199 million tons of plastic in our marine ecosystems. [3] These persistent materials are causing further harm through their production of microplastics. Recent studies point to microplastics generation during use [4] and during recycling [5]. Marine environments provide the appropriate conditions, such as temperature, pH, salinity, and microbial activity, for the biodegradation of renewable and biodegradable materials such as ***P**oly**H**ydroxy**A**lkanoates* (PHA) a biopolymer found in nature. Hence, the global plastics treaty should mandate the use of such materials to mitigate microplastic pollution.

---

[3] United Nations Environment Programme, Beat Plastic Pollution

[4] TNO White Paper on Microplastics (2022)

[5] Erina Brown, Anna MacDonald, Steve Allen, Deonie Allen (2023) The potential for a plastic recycling facility to release microplastic pollution and possible filtration remediation effectiveness, Journal of Hazardous Materials Advances. https://doi.org/10.1016/j.hazadv.2023.100309

GO!PHA
Oudebrugsteeg 9
1012 JN Amsterdam
The Netherlands

12324 Hampton Way
NC 27587 Wake Forest
United States

E-mail: gopha@gopha.org
Website: www.gopha.org

GO!PHA
Global Organization for PHA

About PHA[6][7][8][9]

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

PHA are thermoplastic in nature having the attributes of 7 of the top selling fossil plastics in the world. PHA are being used in many applications to successfully replace fossil plastics [10]. 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.

GO!PHA Recommendations

In addition to the restrictions that the UN is considering placing on the handling and use of persistent and fossil plastics, GO!PHA and our members believe that The UN Plastics Treaty should clearly state that member countries must take concrete and actionable steps to promote the rapid development and deployment of materials that meet all of the following four criteria: being renewable, recyclable, compostable, and free from persistent microplastics.

1. The Treaty should establish targets to encourage member nations to restructure and enhance their waste management infrastructure, specifically focusing on expanding composting and anaerobic digestion capacity. This will facilitate the increased utilization of compostable materials and promote organic waste recycling, which has additional benefits such as organic carbon generation for further renewable carbon-based materials and organic fertilizer production.

2. The treaty needs to set ambitious targets to boost the production and use of renewable materials and products, especially those that are biodegradable and compostable. It is crucial for the treaty to recognize fermentation and enzymatic process technologies and production

---

[6] 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

[7] 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

[8] 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

[9] 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

[10] Koller, Martin & Mukherjee, Anindya. (2022). A New Wave of Industrialization of PHA Biopolyesters. Bioengineering. https://doi.org/10.3390/bioengineering9020074

GO!PHA
Oudebrugsteeg 9
1012 JN Amsterdam
The Netherlands

12324 Hampton Way
NC 27587 Wake Forest
United States

E-mail: gopha@gopha.org
Website: www.gopha.org

methods as critical factors in increasing the use of renewable carbon based, biodegradable and compostable materials.

3. Encouraging research and investment into the aforementioned methods and processes is paramount. Member nations should actively commercialize and adopt materials such as ***P****oly****H****ydroxy****A****lkanoate* (PHA) biopolymers, which naturally and industrially fit into all end-of-life options. The treaty should also mandate ambitious targets for global commercialization of PHA and similar technologies. Technologies to produce such materials in large commercial scale are available and so are the renewable raw materials. Favorable policy and directed investment would allow this industry to grow rapidly.

GO!PHA and our members are grateful for the opportunity to contribute and to attend the upcoming INC-2 being hosted by the United Nations Environment Program in Paris, France.

GO!PHA

Global Organization for PHA

The Global Organization for PHA is a member-driven, non-profit initiative to accelerate the development of Biodegradable and Compostable materials such as PolyHydroxyAlkanoate (PHA) biopolymers.

Renewable, biodegradable and compostable materials provide a unique opportunity to reduce greenhouse gases and environmental plastics 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.

Become a member or a sponsor and start sharing, contributing, and collaborating to accelerate the PHA platform industry.

www.gopha.org