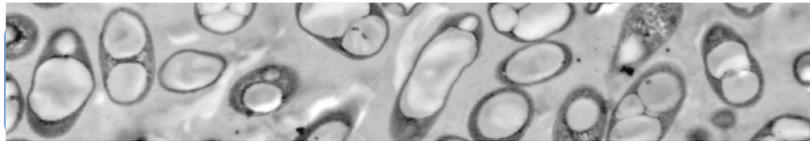


USDA Policy Summit on Jump Starting the Biobased,
Biodegradable and Compostable Materials (BBM or
Bioplastics) Industry

Policy Brief



Date: 24.09.2024

Prepared by: **GO!PHA**

GO!PHA, a non-profit organization, welcomes the USDA Policy Summit and dialogue planned for September 27th, 2024, on jumpstarting the development and proliferation of Bio-based, biodegradable and compostable materials (BBM) as a replacement for fossil-based plastics.

Introduction

Plastics offer benefits, but their persistence and harmful effects now endanger the environment and society. Efforts to combat plastic waste and pollution have primarily focused on recycling, Extended Producer Responsibility (EPR) schemes, targeted bans, and prohibitions. Additionally, the plastics waste and pollution issue are being framed with a strong focus on oceans and accumulating waste in landfills. Yet, plastics are now pervasive across various natural ecosystems, the atmosphere, and even human tissues, such as the lungs, brain, and placenta. And plastics production and consumption is growing faster than the average global GDP growth, driven more by convenience and their low cost than necessity. Tackling this global challenge of escalating persistence of fossil plastics and its wide-ranging negative social, environmental, and economic consequences requires comprehensive global policies and actions that consider the full life cycle approach supported by a strong science-policy interface to ensure policy making is outcome-driven and globally effective.

The UN Global Plastics Treaty

The production and use of fossil plastics is driven by global supply chains that are complex and cover manufacturing and trade in almost all countries, therefore, limiting the use of plastics requires a global policy framework. In this respect the UN Treaty on Plastics, initiated in 2022 has begun to put a framework in place that if implemented globally would address many of the current issues emanating from the use of plastics. Some highlights that the treaty is addressing are:

- Ban and phase out the most harmful and avoidable plastic products
- Address the impact of Plastics pollution on the world's oceans
- Improve waste management systems to deal with legacy plastics waste
- Limit the production, trade and use of plastics
- Promote sustainable production and research into plastics alternatives
- Create new jobs, markets and business opportunities in combating the negative consequences of fossil based plastics and through the promotion of alternatives and substitutes

The latest draft of the Treaty and the ongoing negotiations present several detailed strategies for addressing plastic pollution, including the deployment of new technologies, their associated costs and benefits, financial mechanisms, and transition pathways for implementation of the proposed changes. One proposed approach involves a shift toward “alternative plastics” and “non-plastic substitutes,” which includes biobased and biodegradable materials, focusing on exploring broader categories of materials, considering factors like safety and environmental impact, with the goal of sustainably replacing fossil-derived plastics. Despite these alternatives being included as potential solutions, the Treaty texts, background documents, and discussions between countries during the intergovernmental negotiations (INC) sessions highlight that the suitability of these alternatives as an effective solution to plastic pollution remains contested.

The UN Global Plastics Treaty discussions highlight skepticism and concerns about greenwashing regarding the viability of alternative and substitute materials, as well as debates about whether they are essentially the same as plastics. To address these concerns, there is a need for technical assessments and science-based criteria to evaluate their composition, properties, and performance. However, current negotiation strategies risk applying plastic-focused regulations to alternatives, which poses the risk of stifling innovation and delaying adoption despite clear evidence of their viability and efficacy in their origin, use, environmental impact and safety. Clear distinctions and tailored policies are essential to avoid mislabeling alternatives and undermining their potential as safe solutions.

WHAT SUITABLE SUBSTITUTES ARE	WHAT SUITABLE SUBSTITUTES ARE <u>NOT</u>
Natural and Renewable No fossil carbon	A license to litter
Compatible with circularity design - reusable, recyclable and compostable	A substitute for proper 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

GO!PHA's Call for Criteria-Driven Solutions

Plastics are ubiquitous and many of its benefits are necessary. It has been shown that such benefits are also found in many alternatives and substitutes. In addition, research demonstrates that many more alternatives and substitutes can be developed and commercialized that can take the place of plastics. Therefore, more emphasis is needed in promoting the use and proliferation of alternatives and substitutes, as their plastics-like functionality and increasing use can dramatically drive down plastics use, including many harmful plastics.

The intersessional work mandate leading to INC-5 established two experts groups to inform and help advance the work of the negotiating Committee. Although the meetings are only of a technical and expert nature and not part of the negotiations or decision-making. The committees' assessment is being developed as a source of common knowledge for consideration by national delegations during negotiations at INC-5 in November 2024. Expert Group 2 was tasked with identifying and analyzing criteria and non criteria based approaches for plastics and plastics products. However, since the Treaty considers alternatives and substitutes as plastics, the expert groups' recommendations on the alternatives and substitutes are being applied similar to the conventional plastics strategies.

GO!PHA calls on the treaty negotiators and the Expert Group 2 to emphasize research into new and the rapid adoption of existing alternatives and substitutes. Such use should be based on a set of criteria that ensure their safety, circularity and sustainability. **GO!PHA** believes that the following four pillars should be adopted as the criteria to encourage the adoption of alternatives and substitutes:

Origin	Functionality	Impact	Safety
Renewable carbon from the biosphere Mimic nature's process in industrial scale	Competitive in existing applications Compatible with existing infrastructure	Built-in end of life options: Recycle, compost, biodegrade Low to no environmental impact	Benign to all life forms Microplastics free

Origin: Many substances biosynthesized in plants, animals, algae and microorganisms mimic the attributes of conventional plastics. Many such materials can be industrially produced, making them nature identical. Naturally occurring monomers can be synthesized into materials that mimic the attributes of conventional plastics. They all start with renewable carbon, eliminating the need to use fossil carbon.

Functionality: These biobased, and nature identical and industrially produced materials exhibit functionality that we have come to expect from conventional plastics. And they can be processed on existing machinery and infrastructure, and are compatible with the existing waste collection, recycling and composting infrastructure.

Impact: As industry transitions to renewable energy use in manufacturing, these materials would have low to no environmental impact, starting from renewable carbon and possessing all end of life options - recycle, compost, biodegrade; making them circular and sustainable throughout their life cycle.

Safety: Biobased, biosynthesized materials have been shown to be biocompatible and therefore benign to life forms and to the environment. They do not persist in nature, nor generate microplastics free.



By shifting focus from convenience and low cost to sustainability as a performance criterion, and on innovation, reliance on persistent and harmful plastics can be reduced and eventually eliminated. The UN Treaty needs to put more emphasis on the benefits of existing alternatives and substitutes, and encourage significant research, development and commercialization of newer such materials that originate from renewable carbon feedstocks and use biological or green chemistry routes for their manufacture.

A substantial body of standards based criteria to determine renewability, safety and sustainability exists, the UN expert body must review and recommend them and commission additional test criteria and/or standards that allow the speedy adoption of alternatives and substitutes.

We call on the negotiators and the participating nations to make the adoption of safe and sustainable alternatives and substitutes a priority within the UN Treaty on Plastics.

Support BBMs in the UN Global Plastics Treaty for Maximum Impact

1. ***Make a clear distinction between BBM's and Plastics through tailored policies***
BBMs offer a unique set of benefits which should be recognized and encouraged. Treating them as conventional plastics stifles innovation and delays their adoption. BBM's require a separate set of principles and tailored policies to encourage their adoption to replace plastics.

2. ***Robust Categorization of Materials and Science-Based Assessments***

Lumping all bio-sourced materials into one category risks imposing blanket policies on a vast variety of alternatives and substitutes. A criteria-based approach, that is science based and rooted in material composition, properties, and performance/functionality, should be applied to evaluate suitability. Further research and dialogues with stakeholders are needed to develop additional standards where needed, and targeted testing that includes their environmental or societal benefits.

3. ***Promote (Re)Design and Simplification of Material Composition***

Promoting upstream measures that redesign products using safe alternative materials, such as polymers, chemicals, and additives, while simplifying material composition, can enhance safety during use and improve downstream processing. This reduces the burden on waste management institutions and helps resolve issues like compatibility with current waste infrastructure, standards/labeling, and consumer information without deterring the use of innovative bioprocesses to make safe, biocompatible materials.

4. ***Address Gaps in Assessment Methodologies and Standards***

Addressing gaps in current assessment methodologies, such as Life Cycle Assessments (LCAs), is crucial to developing universally accepted standards. This will enable a more holistic evaluation of BBMs, encompassing environmental sustainability and health effects, thereby enhancing the impact of bio-based products and their origin, functionality, impact and safety.

5. ***Incentivize Development and Use of Alternatives and Substitutes***

Investment in research and development, market-based measures, economic instruments, harmonized standards, technology transfer, and transparent information dissemination practices are needed to support the development and widespread use of BBMs.

About GO!PHA

GO!PHA is a member-driven, non-profit initiative to promote the use 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 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 knowledge-sharing platform, organizes experiences, and facilitates joint

development initiatives with these natural, unique, and innovative materials. Join our cause and be a part of the movement towards a better and more sustainable future!

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 **GO!PHA**

APPENDIX A to GO!PHA Policy Brief on jumpstarting the BBM (biobased biodegradable and compostable materials or bioplastics Industry)

Some highlights that the UN GLOBAL TREATY ON PLASTICS (GPT) is addressing are:

1. Ban and phase out the most harmful and avoidable plastic products
2. Address the impact of Plastics pollution on the world's oceans
3. Improve waste management systems to deal with legacy plastics waste
4. Limit the production, trade and use of plastics
5. Promote sustainable production and research into plastics alternatives
6. Create new jobs, markets and business opportunities in combating the negative consequences of fossil based plastics and through the promotion of alternatives and substitutes

In each of the categories outlined above Alternatives and Substitutes can play an important role, they are highlighted below:

<i>UN Global Plastics Treaty goals</i>	<i>How can BBMs contribute to GPT goals</i>
<i>Ban or phase out the most harmful and avoidable plastic products</i>	<i>Reduction of superfluous products and redesigning with Alternatives and Substitutes (BBMs) needs to be made a priority to ensure circularity, sustainability and safety</i>
<i>Address the impact of plastic pollution on the world's oceans</i>	<i>Biodegradability of materials/products is NOT a solution to litter; but using materials that are marine, freshwater and soil biodegradable within Alternatives and Substitutes are commercially produced. They also fit with current waste management infrastructure worldwide.</i>
<i>Improve waste management systems to deal with the legacy of plastic waste.</i>	<i>BBM's offer ALL End-Of-Life options and therefore, provides a significant economic and environmental advantage, especially in products and applications where</i>





	<p><i>recovery, recycling and reuse is not possible such as in personal care, packaging and agriculture</i></p>
<p><i>Limit the production, trade, and use of plastic.</i></p>	<p><i>In addition to placing limitations of conventional plastics, provide incentives for users to qualify and demand better materials like BBMs can emerge, providing avenues to address negative impacts of plastics</i></p> <ul style="list-style-type: none">- <i>on human health</i>- <i>on natural ecosystems</i>- <i>on waste management systems gaps</i>
<p><i>Promote sustainable plastic production and research into plastic alternatives.</i></p>	<p><i>Explicitly mention and encourage through policy instruments and trade related incentives to move to Alternatives and Substitutes. Evidence that suitable plastic alternatives and substitutes are functional and efficient exists.</i></p>
<p><i>Create new jobs, markets, and business opportunities</i></p>	<p><i>Spurring development, growth and innovation in BBM's will add significant jobs worldwide, including in the US that is rich in available renewable carbon resources to make the production of BBM's economically advantaged.</i></p>
<p><i>Promote circularity via repair, reuse, and recycling.</i></p>	<p><i>Using BBM's needs to be encouraged and prioritized as they are at the core of circularity, sustainability and safety. (Re)using, repairing and recycling (including carbon through composting) using BBM's would not to lead to accumulation and circulation of harmful substances in the economy, in landfills and in the environment, eliminating safety concerns</i></p>



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About PHA^{[1][2][3][4]}

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 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 plastics⁵. 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 is a UNEP-accredited organization that is actively involved in the UN Treaty on Plastics negotiations.
EU Transparency Number: 946264840278-51*

¹ 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>

² 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>

³ 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>

⁴ 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

⁵ Koller, Martin & Mukherjee, Anindya. (2022). A New Wave of Industrialization of PHA Biopolyesters. Bioengineering. <https://doi.org/10.3390/bioengineering9020074>

