Bioplastic Feedstock Alliance Position Statement

A Call for Science-Based Policy on Plastic Alternatives

To reach a future where both people and nature thrive, we will need to realize a material system that is both much more circular and that utilizes renewable, responsibly sourced feedstocks. Biobased plastic and other biobased materials can serve a strong complementary role to circularity, and businesses and governments have an important role to play in reducing plastic consumption, supporting circularity, and enabling biobased alternatives for fossil-derived materials. The Bioplastic Feedstock Alliance calls on policymakers to support a transition to a circular economy when considering regulatory changes, such as material production incentives and reimagining waste management.

Plastic is a versatile material that we rely on to keep our food fresh and our medications safe, but it has critical impacts which must be addressed. Plastic pollution threatens both people and wildlife, and the extraction of fossil fuels for plastic production has many impacts including fossil resource depletion, impacts on local communities, and greenhouse gas emissions. As global plastic pollution continues to grow in scale and impact around the world, this issue is being met with increased public awareness, changes to business, and new policy responses. When developing policy to target plastic pollution, it is crucial to take a comprehensive view that prioritizes the elimination of unnecessary plastic, shifts the system towards circularity, including investing in and building up infrastructure that enables circularity, and integrates responsibly sourced and managed alternative materials (see *WWF's No Plastic in Nature website* for more information).

Alternative materials, including biobased materials, are an essential part of building a sustainable material system and can help reduce our dependence on fossil fuels, but they have important limitations on what they can and cannot deliver. Biobased and biodegradable materials are not a solution to plastic pollution on their own, and no material should be designed to be littered. Furthermore, since no materials can be recirculated infinitely (even aluminum and glass are subject to process loss), biobased materials (those derived from plant materials, not fossil fuels) can serve an important role in replenishing materials in a circular system. However, to realize their sustainability benefits, it is imperative that biobased materials be sourced and managed responsibly (see BFA's Methodology for the Assessment of Bioplastic Feedstocks for more information). New policy in this space should encourage a comprehensive evaluation of solutions including the material's sustainability performance, appropriateness of material for the application, geographical context, and impacts from material sourcing, distribution, use, and disposal. This is critical, as all alternatives to traditional plastic have their own impacts and caution should be taken to avoid trading one problem for another.

The plastic pollution crisis must be met with bold and innovative solutions; choosing the right solutions will require navigating complex tradeoffs. Focusing in on the impact of material choice and sourcing can help illustrate some common tradeoffs that complicate decision making, but it is important to keep in mind that design decisions should ultimately be based not just on the material, but also on the application and supply chain. Different materials have different impacts to our climate, land, and water; and each material must be assessed holistically. There is no one universal attribute that makes a material sustainable, but rather several indicators that should be considered when evaluating the environmental performance of a material. For example, consider two materials: aluminum and biobased plastic. Aluminum has many environmental impacts including the high energy intensity of ore processing, and the biodiversity impacts from bauxite mining. However, this material can be recycled indefinitely with only process losses as limiting factor and it still retains its properties. Biobased plastics may require more water for production than fossil-based plastic and may degrade during the recycling process just as fossil-based plastics do, but they absorb atmospheric CO2 while growing, and when sourced responsibly can foster stewardship and utilize renewable resources. Tradeoffs along the value chain and between different environmental factors are unavoidable. Therefore, the focus should not be finding a perfect option, but on maximizing environmental benefits and committing to continuous improvement of environmental performance over time.

Focusing on environmental performance enables continued innovation in materials development and a consistent, science-based decision-making process. Evaluating the sustainability performance of a material means including the impacts across a material's entire lifecycle, from extraction, through manufacturing, use, and disposal. Focusing on only one of these areas will not produce the best possible result and could result in unintended consequences. The impact that a material has on nature and people can be highly variable even for similar materials, because performance depends not just on the design of a material, but also the practices used in production. For example, the same bio-based polyethylene is commonly made from two different feedstocks, corn ethanol and sugarcane ethanol, and the resulting plastic would be identical in technical performance but use different amounts of water and energy in production. Similarly, different plastics, like compostable polylactic acid and recyclable polyethylene, may both be made from corn ethanol, but have significant differences in technical performance and are therefore appropriate for different applications. They also have different disposal properties, with polylactic acid being industrially compostable, and polyethylene being recyclable. Because of this complexity, materials must be evaluated on their sustainability performance, including appropriateness for the intended application, as categorization cannot ensure good environmental outcomes.

Life Cycle Assessment (LCA) is one commonly used tool to evaluate the environmental impacts of a product across its life, from production to end of life. While LCA can provide important insights, this tool does not capture all impacts relevant to plastic, including landscape level changes like natural habitat conversion, impacts to ecosystem services, or impacts from plastic pollution. Additional considerations beyond typical LCA scope must be included in decision-making, specifically those that consider landscape level and pollution impacts to wildlife, ecosystems, and communities.

Ensuring that sustainability metrics are used to evaluate alternatives to single-use plastic will be particularly important as technologies and new materials evolve and scale up. Examples of common sustainability metrics include indicators such as water usage and pollution, greenhouse gas emissions, biodiversity impacts, and community impacts. Science-based policies that focus on environmental impact are needed to drive change and ensure we do not simply trade one problem for another. This approach will also incentivize innovation and continuous improvement toward the lowest-impact materials. The Bioplastic Feedstock Alliance calls on policy makers to put a science-based approach at the center of their focus when it comes to addressing plastic pollution.

The Bioplastic Feedstock Alliance provides thought leadership on the responsible sourcing of bioplastics, and the role of bioplastic in circular systems. The BFA explores the latest science to advance knowledge of bioplastics and their social and environmental impacts. The BFA aims to ensure bioplastics ultimately contribute to a more sustainable flow of materials, to create lasting value for present and future generations. Visit https://bioplasticfeedstockalliance.org/ for more information.