

Bioplastics: Innovation for a Circular Future

EXPLORING THE ROLE OF RENEWABLE AND COMPOSTABLE PLASTICS IN A **SUSTAINABLE ECONOMY**



Bioplastics are plastics that are made from plant or biological material rather than fossil based (petroleum) feedstocks. As the plastics industry evolves, bioplastics offer promising innovations that support circular economy goals — when used thoughtfully and recovered responsibly.

What Are Bioplastics?

Other than being made from renewable sources, bioplastics are identical in properties to their conventional fossil-based counterparts. They can be durable, biodegradable or compostable.

- **Durable:** Any type of plastic that is able to be used for a long period of time without getting damaged. These plastics require recycling processes to effectively manage them.
- **Biodegradable:** Broken down into simpler substances by microorganisms. The timeline depends on the condition and environment.
- **Compostable:** Designed to decompose fully and safely within a specific timeframe under defined conditions. Can be certified as industrial or home compostable.



Benefits of Bioplastics

- ✓ Bioplastics are made from renewable resources.
- ✓ They can reduce our reliance on fossil fuel based sources of energy, which are non-renewable.
- ✓ Certified compostables support diversion of organics away from landfills.
- ✓ Bioplastics align with circular economy strategies for waste reduction.

Challenges of Bioplastics

- ❗ Bioplastics are typically more expensive than conventional plastics to produce.
- ❗ Bioplastics are made from plants which require land and water. Large-scale production can compete with food crops and contribute to biodiversity loss.
- ❗ Bioplastics are not a one-size-fits-all solution — they could play an important role in a circular economy that reduces the amount of plastic pollution ending up in our environment.

Myth-Busting: Common Misconceptions About Bioplastics

- ✗ **All bioplastics are biodegradable**
 - ✓ Some bioplastics — like biobased PET (polyethylene terephthalate) — are durable and made from renewable resources but behave like conventional plastics and do not break down in the environment. This means they need to be recycled through existing systems and won't compost or biodegrade.
- ✗ **All Bioplastics are Biodegradable or Compostable**
 - ✓ Whether a plastic is biodegradable or compostable is based on the product design, not the material that was used to make the plastics. Some conventional plastics are biodegradable or compostable but are made from fossil based feedstocks, not renewable resources like plants. Biodegradability does not always mean “natural” or “plant-based.” It depends on how the material is designed to break down — not where it comes from.
- ✗ **Biobased plastic requires a different recycling stream than conventional plastics**
 - ✓ Biobased plastic is chemically identical to conventional, the only difference is the source of its feedstock. Because the molecular structure is the same, biobased plastic can be recycled in the same stream as conventional plastic. This makes it a drop-in solution that supports recycling infrastructure while reducing dependence on fossil based feedstocks.

The Future of Plastics Innovation

With continued investment in research, design, and waste recovery systems, bioplastics are a useful tool that contribute to building a smarter, more circular future for the plastics industry.



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