

# The Global Market for Bioplastics and Biopolymers to 2033

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## Abstracts

There is fast growing demand for plant-based product solutions, including eco-friendly bioplastics. Global plastics production was over 367 million metric tons in 2020 and consumption is forecast to double by 2050. Apart from the environmental problems associated with extracting the non-renewable resource, nearly 80 million tonnes of plastics end up in landfills. Bioplastics and biopolymers are a biodegradable and sustainable alternative to fossil-based plastics.

Polymeric biomaterials are biobased products that allow for greater product sustainability due to their biodegradability and renewability. Their use is attractive as bioplastics that biodegrade to CO<sub>2</sub> and H<sub>2</sub>O mitigate the negative effects of standard plastic (litter and damage to aqua environments). Renewable feedstocks can be utilized instead of petroleum, thereby reducing global dependence on crude oil and lessening the impact on climate.

The sky rocketing price of petroleum coupled with government regulations and consumer global environmental concerns, and continued population growth is pushing the plastic industries towards sustainability. Growing government regulatory restrictions, consumers' desire and energy conservation are some of the key factors that drive research and product development towards renewable resource-based polymeric biomaterials. The performance of bioplastics is also improving and range of applications expanding. LG Chem and Archer Daniels Midland Co. (ADM) have launched two joint ventures for U.S. production of lactic acid and polylactic acid to meet growing demand for a wide variety of plant-based products, including bioplastics.

Bioplastics are defined as 'biobased and/or biodegradable plastics', a globally accepted definition. Not all bioplastics are biobased and if referring to the plastic problem of non-

biodegradability, not all bioplastics are biodegradable. Biobased is based upon the carbon source while biodegradability upon chemical structure.

These include:

Biobased plastics that are not necessarily biodegradable (including conventional polymers, e.g. PE, made from biobased monomers.

Plastics containing both petro-based and bio-based components, e.g. PET, not necessarily biodegradable.

Biodegradable or compostable plastics derived from biobased materials, such as starch, cellulose, polylactides or polyhydroxyalkanoates.

Biodegradable petroleum-based plastics, e.g. PBAT.

Bioplastics producers have scaled up production considerably, with further expansion over the next few years. This report covers:

Analysis of non-biodegradable bio-based plastics and biodegradable plastics and polymers.

Global production capacities, market demand, market drivers, trends and challenges.

Analysis of biobased chemicals including:

Bio-based adipic acid

11-Aminoundecanoic acid (11-AA)

1,4-Butanediol (1,4-BDO)

Dodecanedioic acid (DDDA)

Epichlorohydrin (ECH)

Ethylene

Furfural

5-Chloromethylfurfural (5-CMF)

5-Hydroxymethylfurfural (HMF)

2,5-Furandicarboxylic acid (2,5-FDCA)

Furandicarboxylic methyl ester (FDME)

Isosorbide

Itaconic acid

3-Hydroxypropionic acid (3-HP)

5 Hydroxymethyl furfural (HMF)

Lactic acid (D-LA)

Lactic acid – L-lactic acid (L-LA)

Lactide

Levoglucosenone

Levulinic acid

Monoethylene glycol (MEG)

Monopropylene glycol (MPG)

Muconic acid

Naphtha

Pentamethylene diisocyanate

1,3-Propanediol (1,3-PDO)

Sebacic acid

Succinic acid (SA)

Analysis of synthetic biopolymers market including:

Polylactic acid (Bio-PLA)

Polyethylene terephthalate (Bio-PET)

Polytrimethylene terephthalate (Bio-PTT)

Polyethylene furanoate (Bio-PEF)

Polyamides (Bio-PA)

Poly(butylene adipate-co-terephthalate) (Bio-PBAT)

Polybutylene succinate (PBS) and copolymers, Polyethylene (Bio-PE),  
Polypropylene (Bio-PP)

Analysis of naturally produced bio-based polymers including

Polyhydroxyalkanoates (PHA)

Polysaccharides

Microfibrillated cellulose (MFC)

Cellulose nanocrystals

Cellulose nanofibers,

Protein-based bioplastics

Algal and fungal based bioplastics and biopolymers.

Market segmentation analysis. Markets analysed include packaging, consumer goods, automotive, building & construction, textiles, electronics, agriculture & horticulture.

Market growth to 2033 in terms of consumption and producer capacities.

Emerging technologies in synthetic and natural produced bioplastics and biopolymers.

More than 300 companies profiled including products and production capacities. Companies profiled include major producers such as Arkema, Avantium, BASF, Borealis, Braskem, Cathay, Danimer Scientific, Indorama, Mitsubishi Chemicals, NatureWorks, Novamont, TotalEnergies Corbion and many more. Profiles include products and production capacities.

Profiles of start-up producers and product developers including AMSilk GmbH, Notpla, Loliware, Bolt Threads, Ecovative, Kraig Biocraft Laboratories, Plantic, Spiber and many more.

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