



COMPOSTABLE
BIOPLASTIC
MANUFACTURER
IN INDIA

Approved by CIPET, Govt of INDIA

Dr. BICO

BIOPLASTICS & PRODUCTS
GO SUSTAINABLE

From corn to bio plastic



hitech

a Hi Tech Group &
JSM Global Inc., California, USA
partner company



With a vision to improve the sustainability and anticipating market trends and future environmental regulations, Hi Tech Group a 38 year old manufacturer of masterbatches, resins and films has developed a new range of renewable and compostable biobased biopolymers: Our bio polymers are produced from Corn Starch in the agriculture rich region of Punjab, India and available in 45 countries globally.

Hi Tech Group's commitment towards sustainability is oriented to reduce the greenhouse gas impact, minimize the dependence on fossil oil derivatives, promote the use of renewable energies and to reduce the plastic waste in the environment.



Spread in 200,000 sq ft manufacturing area



Fully automated manufacturing line for manufacturing Bio Polymers



In house testing laboratory for consistent quality & control



Team of 70+ Sales & Service Manager across India



Present in 45 countries globally

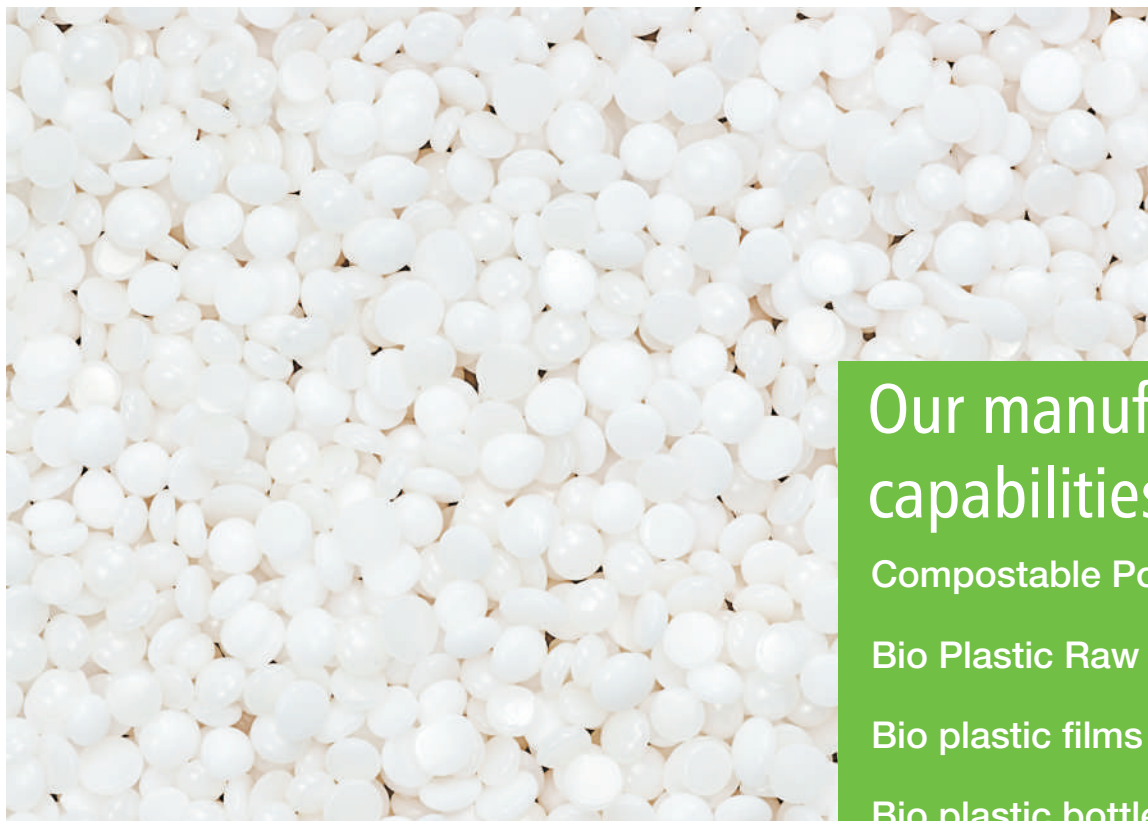


Approved for Compostable standards



Contracts with farms for corn in the fertile state of Punjab





Our manufacturing capabilities

Compostable Polymer

Bio Plastic Raw Materials

Bio plastic films

Bio plastic bottles

Dr Bio is manufactured using bio based raw materials that are compostable and completely disintegrate during composting, undergoes aerobic biodegradation and have no adverse effect on plant growth.

It is manufactured in compliance with the ISO 17088 and IS 17088 standards. Below test equipments are available in our lab for validation of each batch produced with care.

Lab Equipment

MFI | Composting | Tensile | Tear | UV | Dart | MFI | VIA | Salt Spray
Humidity Chamber | Specific Gravity | Water proofness

Approved for

ISO / IS 17088
ISO 14855-1
ISO 14855-2
ASTM D 5338
ISO 16929
ISO 20200

Complies to

EN 13432:2000
ASTM D 6400





Our Global Team



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CEO, USA



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CEO, UK



Mark T.
MD
Preservation



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Director
Canada



Stephen B.
MD
Germany



Sid Sareen
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Mukul Sareen
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Mexico



Leonard P
VP Sales
USA



Asif A
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Horacio R.
Head Sales
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Ahmet
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Phillipps W.
Head Sales
Oceanic



Antoine B
Head Sales
France



Jhong Z
Head Sales
China



Dieter
Head Sales
South Africa





A note from the Director's Desk

Dr. BIC

BIOPLASTICS & PRODUCTS

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Mukul Sareen

Director Business Development

B.IB (Hons), EE Harvard USA

Sid Sareen

Director Technical

Chemical & Polymer Engineer

Dr Bio is made from corn and is 100% compostable and biodegradable which has proven to be the best alternative of the normal plastic which does not depletes even in 1000 years. As for recycling paper, there is a limit to **recycling paper** and every kg of paper uses 70 liters of water to recycle the paper, which is counterproductive. Similarly, the process of recycling aluminum and recyclable plastic has high upfront capital costs and these processes themselves are unhygienic and unsafe. Even the recycles products are not of very high quality.

Dr. Bio polymers are just completely bio degradable, they can be **licensed** to other manufactures for usage in their manufacturing of various products as a substitute to conventional non biodegradable polymers on their **existing infrastructure**. It will also bring forward savings of upto 30% on electricity consumption during its processing. The products offered by the company are used in different sectors and applications such as appliances, plastic bottles, packaging, fresh food packaging, folded cartons, cellphone cases, service ware, nonwovens, other durable goods, printing toners etc.

The major advantage is that bio-based polymers **replace fossil carbon** in the production process with renewable carbon from biomass. This is indispensable for a sustainable, climate-friendly plastics industry. It shall also result in elimination of micro plastics from our environment. The **second most important** advantage is that is offering **employment to our farmers** to produce the rich maize crop which is a major raw material as against the import of crude oil that is used for production of currently used polymers. It has significant economic advantages and will help reduce the trade deficit.

Hi Tech Group a **38 year old manufacturer** of master batches, resins and films has developed a new range of renewable and compostable bio based biopolymers: Our bio polymers are produced from Corn Starch in the agriculture rich region of Punjab, India and available in 45 countries globally. Hi Tech Group's commitment towards sustainability is oriented to reduce the greenhouse gasses impact, minimize the dependence on fossil oil derivatives, and promote the use of renewable energies and to reduce the plastic waste in the environment..



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A note from the Director's Desk

Dr. BICO

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Following our core values, we have optimized our production processes in order to reduce the generated waste with a "zero waste" policy and to minimize our CO2 footprint impact from our activities. says Sid Sareen, Chemical & Polymer Engineer, and the group's Technical Director.

Dr. Bio is compostable polymer, which means the bio plastic disintegrates and completely composts within six months as validated by Govt of India laboratory. The Dr Bio compostable bioplastic material will have been converted to CO2. The remaining share is converted into water and biomass, which no longer contains any plastic. No heavy metal contents and no harmful substances should be left behind

According to some reports, Urban India generates 62 million tons of waste (MSW) annually, and this will reach 165 million tons in 2030. 43 million tons of municipal solid waste is collected annually, out of which 31 million is dumped in landfill sites and just 11.9 million is treated.

The sizes of landfills in India is constantly increasing and that is fast becoming a major concern. Contrary to the composition of waste in western countries, the majority of India's waste is organic which means that there is a tremendous opportunity to compost a lot of it. Then there is sustainability, renewable feedstocks such as corn, sugarcane, and algae can be utilized as raw material instead of petroleum, thereby reducing global dependence on crude oil and lessening the impact on climate.

With our unique Farm to Polymer model we are working closely with farmers to procure and secure our highly refined corn starch supplies and other essential bio mass inputs. The supplies are assured even if we 10X our production capacity than that of today as stated by Mukul Sareen, Director Business Development.



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Process on which Dr Bio Polymer can be manufactured

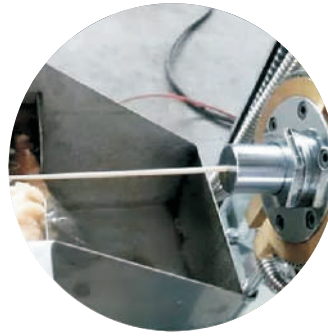
Dr Bio Plastics raw materials suitable for



Blown Films



Cast & Lamination



Pipes & Straws



Injection & Blown Moulding

Products that can be produced using Dr Bio Polymers

Dr Bio Plastics Products



Food Packaging



Lamination



Shopping / Carry Bags



Agriculture



Shrink & Stretch Films



Paper Like Films



Bottles & Containers



Cutlery





OUR COMMITMENT TO QUALITY, SAFETY AND THE ENVIRONMENT

We are committed to making safe and effective products that reduce industry's impact on the environment. Our products are approved by many major companies' toxicology, engineering and packaging departments and comply with health and safety regulations around the globe including the following:

CERTIFICATIONS of Hi Tech Group



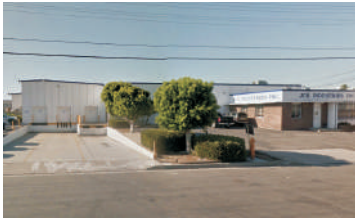
Not only do HITECH products prevent waste, they are also environmentally responsible. Our product range has bio based and degradable polymers, recyclable polymers made from bio mass.





Our global partner manufacturing sites

GLOBAL SITES



California, USA



Australia



Lyon, France



Dubai



Italy



Germany

INDIAN SITES



Mumbai



Punjab



Chennai



Delhi, NCR
Corporate Office



Delhi, NCR



Delhi, NCR



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Dr Bio Trademark Registration

Certificate

Standard: ISO 9001:2015

Certificate Registr. No: 85 100 001 20028

Certificate Holder: HI - Tech International
Near Ludhiana Airport, Sahnawal,
G.T. Road, Ludhiana – 141 120,
Punjab, India.

Scope: Manufacture of VCI PACKAGING and
TUFFPAULIN Plastic Sheets.

Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.

The due date for all future audits is (09.11).

Validity: The certificate is valid from 2020-11-26 until 2023-11-25

Bangalore: 2020-11-26

The Certification Body of
TUV Rheinland India Pvt. Ltd.
21/6, 1st Cross Road,
Electronic City Phase II,
Bangalore - 560 100, India.

Signature

ISO 9001

The validity of this certificate is subject to timely surveillance or surveillance audits as agreed in the Contract.
The validity of this Certificate can be verified online www.tuv.com with the Identification No. 8510000018

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ISO 9001





Corn



**Dr. Bio
Polymers**



Dr. Bio Products



Compost



Raw Materials

The process typically starts with growing plants such as sugar cane, corn and potatoes that are high in starches, the raw materials that replace petroleum products in bioplastics.



Extraction

The plant materials are harvested and processed to extract their starches.



Refining

The starches are processed further in bio-refineries through the use of special enzymes or fermentation (much as biofuels are made) to produce the chemical compounds that react to make plastics. The compounds can be refined to fit the specifications manufacturers need for different products.

The Life Cycle of Bioplastics

Some bioplastics decompose in a fairly short period of time, and the full life cycle of such products is shown here. Other bioplastics aren't biodegradable. But even in those cases, the use of plant-based raw materials means that pollution is being removed from the atmosphere while the plants grow, giving bioplastics a green appeal.

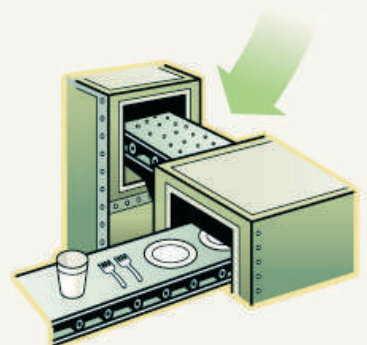


Compost and Renewal

The organic waste will compost and return to the earth as mulch to help new crops grow, completing the cycle.

Disposal

When disposing of a bioplastic product that is fully biodegradable, consumers can place it in an organic-waste collection bin.



Manufacturing

Bioplastics manufacturers use pellets or granules of the compounds to make utensils, plates, cup linings, carpeting and other products.

Sources: CTC Clean Tech Consulting GmbH; WSJ reporting





Comparison with plastics

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Plastic

VS

Dr Bio

**Energy Consumption
in production**

High

48% lower than petroleum based plastic production

Raw Material

Petroleum a non-renewable resource

Biomass obtained from starch of corn sugarcane potato & other renewable crops

Carbon Footprint

High as petroleum is involved

62% less emission of Co2 which is significantly less than traditional plastic

Presence of Chemicals

Presence of Bisphenol A (BPA) which is a potential hormone disrupting chemical

No presence of any toxic chemical

Physical Properties

Highly stable and thermo-plastic

Equally stable with high thermo-plasticity as traditional plastics

Biodegradability

Could take more than 500 years to decompose completely; needs to be recycled

Decomposes inside 180 days if decomposed in the right environment; releases methane on decomposition which can be harnessed to produce energy

Effect on holding content

Fails to retain the flavor & scent of the food stored in then potentially releases harmful substances in the food on long exposures

Retains the original flavor & scent of the food being carried in them

Banned

79 Countries

New way forward

Processability

injection films
blow moulding

injection films
blow moulding

Price

Low

20% - 100% higher than traditional plastic



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Bags

Dr Bio 7272

Blow Film Extrusion
Carry Bags, Films, Sheets



Containers

Dr Bio 7279 - Off White

Injection Moulding
Thermoforming



Bottles

Dr Bio 7279 - Off White

Injection Moulding
Thermoforming



Bottles

Dr Bio 7277

Injection Moulding Grade
Bottles, Containers - Transparent



Water Soluble Films

Dr Bio 7274

Blow Film Extrusion
Cast Film Extrusion



Straw, Filament Extrusion Grade

Dr Bio 7281 - Transparent
Dr Bio 7282 - Offwhite

Filament Extrusion





Bio-Polymer Grades

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Shrink &
Stretch Films

Dr Bio 7275

Blow Film Extrusion
Cast Film Extrusion



Air Cushions

Refer
Fillezy Product Range

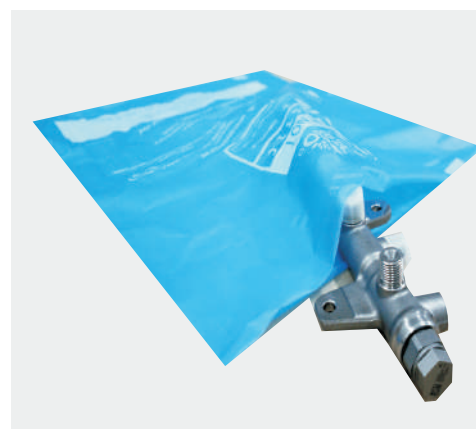


INFLATED ON RAPID



Anti
Corrosion Films

Refer
Rust-X Product Range



Mailer Bags

Dr Bio 7291

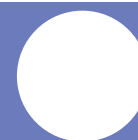
Compostable Mailer bags



Mulching
Films

Dr Bio 7292

Agriculture Films



Disposal Bags

Dr Bio 7293

Waste Disposal Bags



Dr Bio 7272 - Film grade - Off White

BLOWN FILM

Dr. Bio Polymers are the new eco-friendly resins that are made up of Compostable polymers & starch blends. The Dr.BIO Resin is a film grade resin and can be processed on standard blown film lines or blow moulding lines. The manufactured products using this resin are degradable in normal land fill environment and get disintegrated within 3-6 months after being disposed off in a land-fill. The polymer resin can be converted to shopping bags, bin liners, mailer envelopes, agricultural films, sheets, blow moulded bottles etc.

Dr bio resins are engineered for high performance and can be easily processed on standard extrusion equipment. Our films are durable and strong, affording an excellent heat-seal strength, and allowing for crisp and clear printability. For applications where high barrier properties are required, Dr Bio films can be easily combined with other substrates in a laminate structure as a sealant layer.

ADVANTAGES

- 100% compostable and meets requirements of ISO 17088 and IS 17088
- Contains no heavy metals
- Suitable for a wide variety of film and packaging applications
- UV protection functionality available
- Excellent tear, elongation, and dart properties for finished products
- Opaque white which can be added with other coloured masterbatches
- Finished products allow for crisp and clear printing
- Excellent heat-seal strength
- Can be used as a sealant layer in laminate structures
- Ready to use polymer
- Can be processed in all general extruders; monolayer or multilayer
- No special extrusion changes are required in process or equipment except temperature
- Suitable for food contact
- Processing temperature 90-120 degrees C

APPLICATIONS

- Compostable bags and liners
- Carry-out and shopper bags
- Produce bags
- Food service gloves
- Agricultural mulch film
- Apparel packaging
- Films for food service and consumer packaging
- Heat sealant layer for laminate packaging structures



Dr Bio 7277 Injection & Blow Moulding - Transparent

Dr Bio 7279 Injection & Blow Moulding - Off white

Extrusion Grade

Moulding – Injection & Blown

Injection moulding is a manufacturing process for producing parts by injecting molten material into a mould, or mold. Injection moulding can be performed with a host of materials mainly including metals (for which the process is called die-casting), glasses, elastomers, confections, and most commonly thermoplastic and thermosetting polymers. Material for the part is fed into a heated barrel, mixed (using a helical screw), and injected into a mould cavity, where it cools and hardens to the configuration of the cavity.

Extrusion blown moulding is used to produce hollow parts, such as bottles and containers

ADVANTAGES

- 100% compostable and meets requirements of ISO 17088 and IS 17088
- Contains no heavy metals
- Suitable for a wide variety of packaging applications
- Opaque white which can be added with other coloured masterbatches
- Finished products allow for crisp and clear printing
- Excellent heat-seal strength
- Ready to use polymer
- Can be processed in all general extruders; monolayer or multilayer
- No special extrusion changes are required in process or equipment except temperature
- Suitable for food contact
- Ideal processing melt temperature is 150°C and a casting temperature of 30°C should be applied.

APPLICATIONS

- Bottles, containers, jars
- Caps, lids, take away cups, tea pod, coffee pods, cutlery
- Electronics, electricals, cabinets, body of computers, printers
- Nets, straws or tea bags that are 100% compostable.
- Barrier properties for food packaging
- Transparent grades available
- Food contact
- Compostable
- The perfect solution for thermoforming



Dr Bio 7281 Profile & Filament grade - Transparent

Dr Bio 7282 Profile & Filament grade - Off White

Filament / Pipe Grade

Profile extrusion is a process by which various plastic materials are used to develop quality plastic products. These products have a continuous cross-section such as pipe, nets, 3d printers raw material, drinking straws, decorative molding, window trimming and many others. The basic procedure of profile extrusion is that the polymer is melted into a hollow mold cavity, under the influence of high pressure.

Unlike injection moulding where the process makes individual identical components, the extrusion process makes a continuous length of plastic with a constant cross section. This cross section can be a profile or filament depending on the shape of the die. Once the material is extruded, the product is cooled and then it can be spooled, or cut into different lengths for later use. Conventional single use food packaging items have an enormous environmental impact. Legislation and current sustainable tendency look for new alternative materials that solve the waste problem of them.

ADVANTAGES

- 100% compostable and meets requirements of ISO 17088 and IS 17088
- Contains no heavy metals
- Suitable for a wide variety of packaging applications
- Opaque white which can be added with other coloured masterbatches
- Finished products allow for crisp and clear printing
- Excellent heat-seal strength
- Ready to use polymer
- Can be processed in all general extruders; monolayer or multilayer
- No special extrusion changes are required in process or equipment except temperature
- Suitable for food contact
- Ideal processing melt temperature is 150°C and a casting temperature of 30°C should be applied.

APPLICATIONS

- Nets, straws or tea bags that are 100% compostable.
- Barrier properties for food packaging
- Transparent grades available
- Food contact
- Compostable
- The perfect solution for thermoforming



Dr Bio 7291 Lamination Grade for paper and multilaminated paper boards (like Tet Packs)

Lamination film grade for paper

Dr Bio products are produced from renewable resources instead of petroleum, thus offsetting the need for foreign oil and reducing waste. In conventional paper cups they are coated with PE (Polyethylene) derived from oil, to make board waterproof. Cups coated in Dr Bio bioplastic is derived from plants, so both the board and the coating are derived from fully renewable sources.

Today, plastic is not the best material to use for any mass produced product because it is definitely not biodegradable. However, polymers that coat these paper products are still not as biodegradable as 100% pure Dr Bio coated eco friendly paper products.



ADVANTAGES

- 100% compostable and meets requirements of ISO 17088 and IS 17088
- Contains no heavy metals
- Suitable for a wide variety of lamination applications
- Opaque white or transparent which can be added with other coloured masterbatches
- Excellent heat-seal strength
- Ready to use polymer
- Can be processed in all general extruders; monolayer or multilayer
- No special extrusion changes are required in process or equipment except temperature
- Suitable for food contact
- Ideal processing melt temperature is 150°C

APPLICATIONS

- Paper cups , food trays, packaging paper
- Envelope window.
- Candy twist packaging.
- Cupstock board



Making your Lamin



What is biodegradation?

Biodegradation is a chemical process in which materials are metabolised to CO₂, water, and biomass with the help of microorganisms.

The process of biodegradation depends on the conditions (e.g. location, temperature, humidity, presence of microorganisms, etc.) of the specific environment (industrial composting plant, garden compost, soil, water, etc.) and on the material or application itself. Consequently, the process and its outcome can vary considerably.

What is compostable?

Compostable plastics disintegrate after 12 weeks and completely biodegrade after six months. That means that 90 percent or more of the plastic material will have been converted to CO₂. The remaining share is converted into water and biomass, which no longer contains any plastic. No heavy metal contents and no harmful substances should be left behind.

What are physical properties?

Bio-based plastics have the same properties as conventional plastics but also feature the unique advantage to reduce the dependency on limited fossil resources and to potentially reduce greenhouse gas emissions. Moreover, bioplastics can make a considerable contribution to increased resource efficiency through a closed resource cycle and use cascades, especially if bio-based materials and products are being either reused or recycled and eventually used for energy recovery (i.e. renewable energy).

What are typical applications?

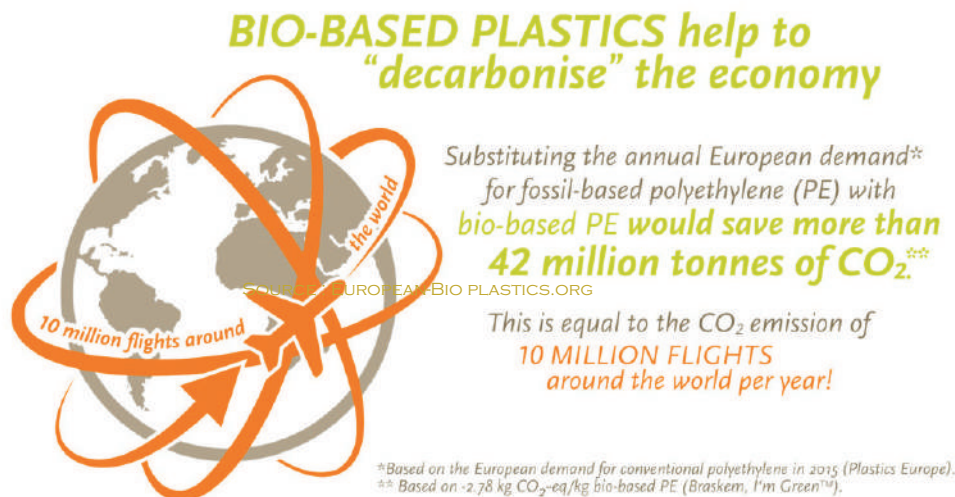
Using biodegradable and compostable plastic products such as biowaste bags, fresh food packaging, or disposable tableware and cutlery increases the end-of-life options. In addition to recovering energy and mechanical recycling, industrial composting (organic recovery / organic recycling) becomes an available end-of-life option. The use of compostable plastics makes the mixed waste suitable for organic recycling (industrial composting and anaerobic digestion), enabling the shift from recovery to recycling (a treatment option which ranks higher on the European waste hierarchy). This way, biowaste is diverted from other recycling streams or from landfill and facilitating separate collection – resulting in the creation of more valuable compost.

How to recycle bioplastics?

If a separate recycling stream for a certain plastic type exists, the bioplastic material can simply be recycled together with their conventional counterpart – e.g. biobased PE in the PE-stream or bio-based PET in the PET stream – as they are chemically and physically identical in their properties. The post consumer recycling of bioplastics materials for which no separate stream yet exists, will be feasible, as soon as the commercial volumes and sales increase sufficiently to cover the investments required to install separate recycling streams. It is expected, that new separate recycling streams for PLA for example will be feasible and introduced in the short to medium term. Compostability is a clear benefit when plastic items are mixed with biowaste. Under these conditions, mechanical recycling is not feasible, neither for plastics nor biowaste. The use of compostable plastics makes the mixed waste suitable for organic recycling (industrial composting and anaerobic digestion), enabling the shift from recovery to recycling (a treatment option which ranks higher on the European waste hierarchy). This way, biowaste is diverted from other recycling streams or from landfill and facilitating separate collection – resulting in the creation of more valuable compost.

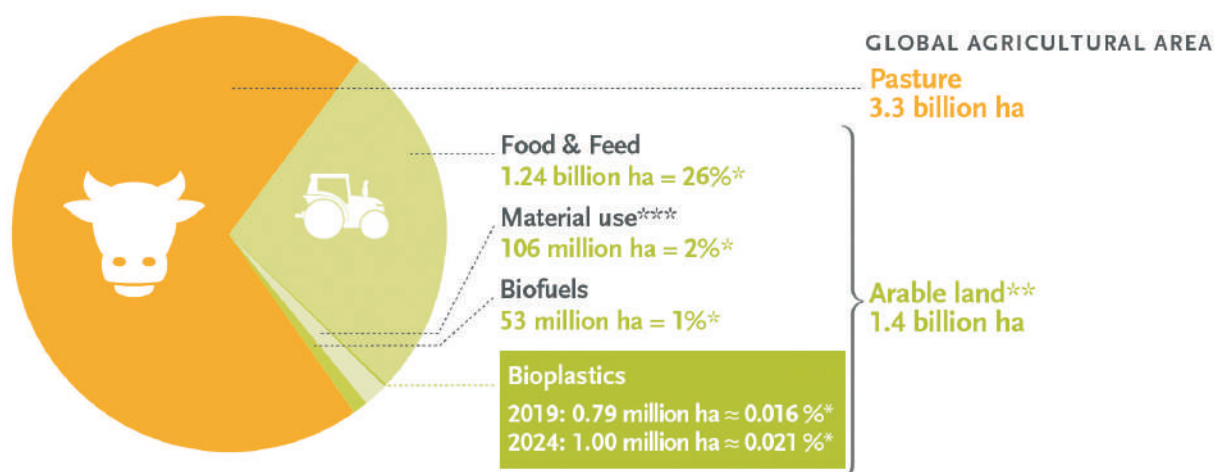


Decarbonization



Raw materials need only 2% Land use

Land use estimation for bioplastics 2019 and 2024



Source: European Bioplastics (2019), FAO Stats (2017), nova-Institute (2019), and Institute for Bioplastics and Biocomposites (2019). More information: www.european-bioplastics.org

* In relation to global agricultural area
** Including approx. 1% fallow land
*** Land-use for bioplastics is part of the 2% material use



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