Bioplastics at the Crossroads

Nordic Bioplastic 2024 Conference

11 April 2024, Copenhagen

europeanbioplastics

Agenda

1 About European Bioplastics (EUBP)

2 What are bioplastics?

3 Market data

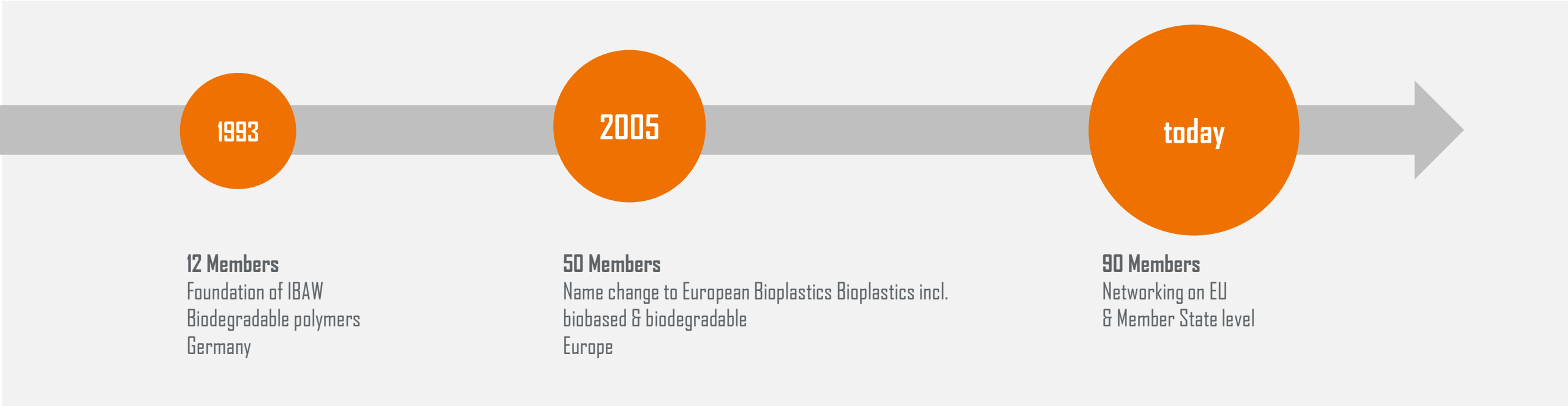
4 Myths and Facts

5 Conclusion

About European Bioplastics (EUBP)

European Bioplastics: 30 years of bioplastics experience

- European Bioplastics represents the interest of the bioplastics industry along the entire value chain in Europe.
- Our foremost goal and commitment is to build and strengthen a supporting policy framework in the EU for bioplastics to thrive through a strong network and engagement in dialogue with all relevant stakeholders.



Activities and services

EUBP is a knowledge partner and business network for companies, experts, and all relevant stakeholder groups of the bioplastics industry.

Our activities and services at a glance

- Gathering insights and knowledge about the industry
- Formulating and communicating our industry's key positions
- Representing our members' policy interests in Europe
- Connecting our members with potential business partners
- Facilitating a dynamic stakeholder dialogue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Position of European Bioplastics concerning

BIOPLASTICS AND THE CIRCULAR ECONOMY

European Bioplastics (EUBP) welcomes the transition away from a linear to a circular economy, whilst urging legislators to consider measures, which accelerate the sustainable development of Europe's bio-economy by promoting

Just as traditional refineries, biorefineries maximize the use and value of feedstock and exploit all of the elements of the feedstock, recycling secondary products and wastes into valuable products, often using bi-products which fuel the

What are Bioplastics?

BIOPLASTICS

biobased
(e.g. bio-PE)

biodegradable
(e.g. PBAT)

or both
(e.g. starch blends)

Terminology

biobased

The term biobased describes a material or product that is (at least in part) derived from biomass.

biodegradable

Biodegradation is a natural chemical process in which materials are being transformed into natural substances such as water, carbon and biomass with the help of microorganisms. The process of biodegradation depends on the environmental conditions as well as on the material or application itself. Consequently, the process and its outcome can vary considerably.

Biodegradability is linked to the structure of the polymer chain and does not depend on the origin of the raw materials.

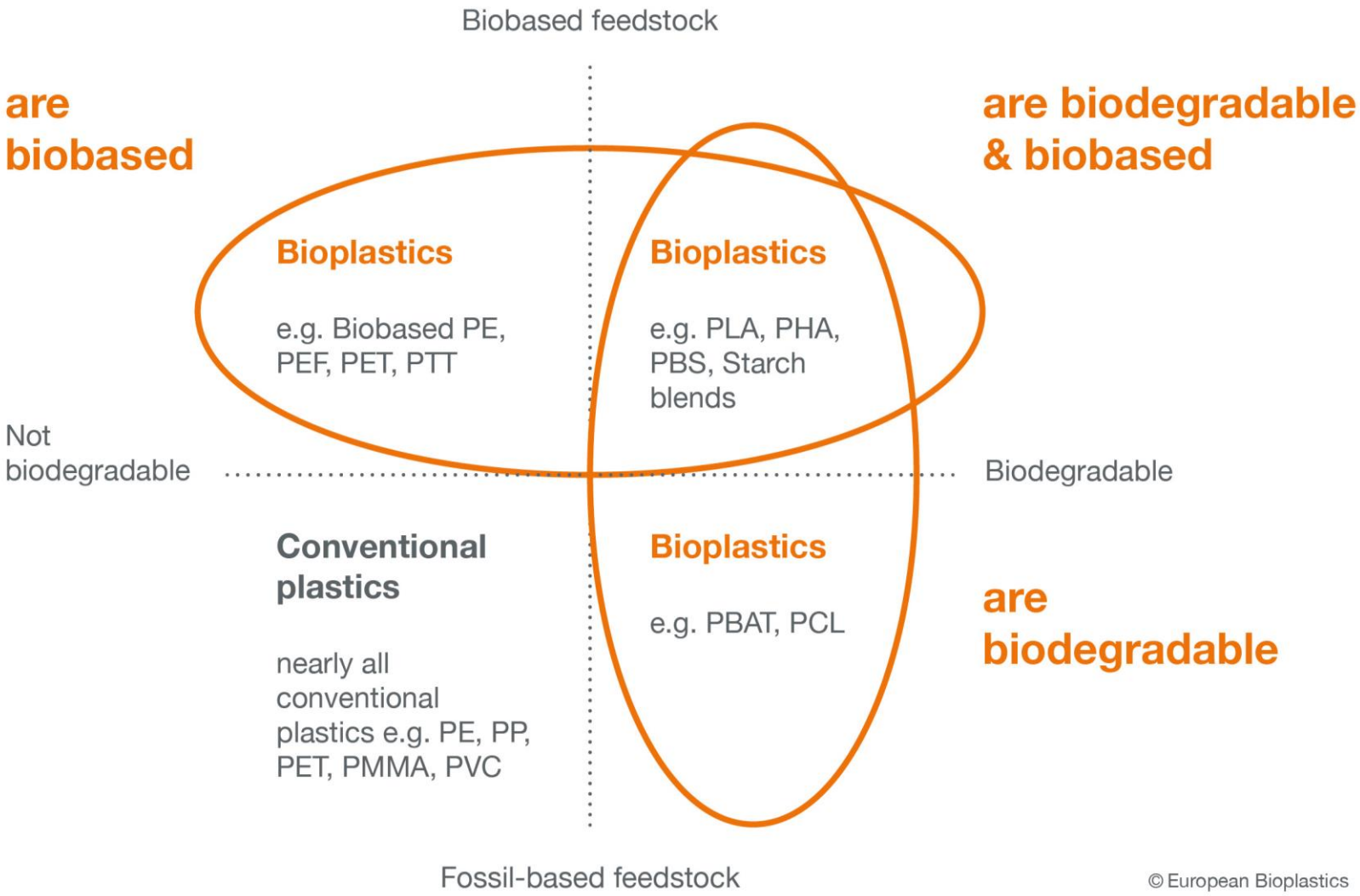
compostable

Compostability is a characteristic of a product that enables biodegradation under specific conditions (i.e., a certain temperature, timeframe, etc.). At the end of this process, for example in an industrial composting plant, only natural products remain (water, carbon, biomass).

Currently, the distinction is made between industrial and home composting.

Material coordinate system for bioplastics

Bioplastics are biobased, biodegradable, or both.



Source: Institute for Bioplastics and Biocomposites (IfBB) and European Bioplastics (EUBP)

Market data

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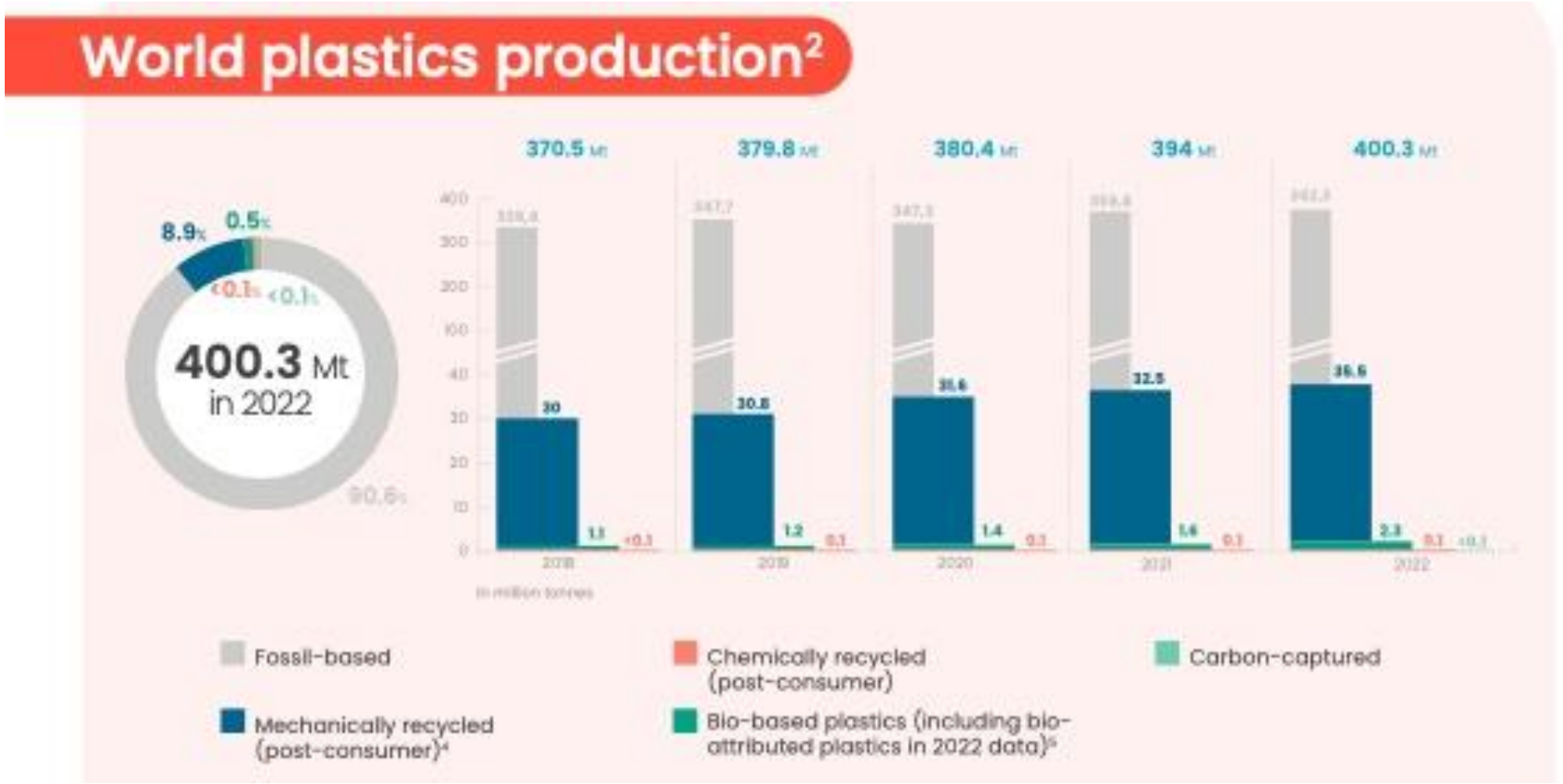
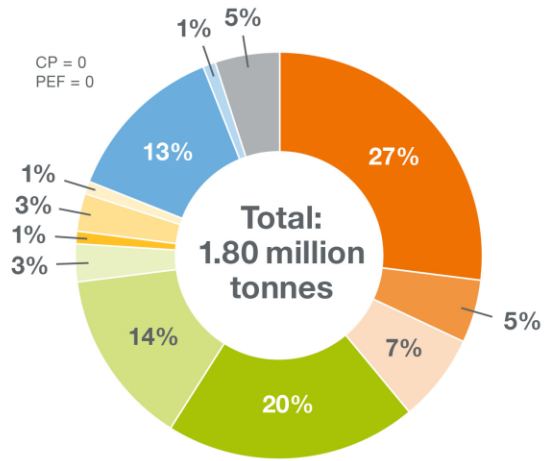
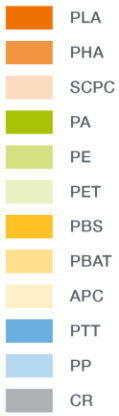
Global Plastics Production (Plastics Europe)



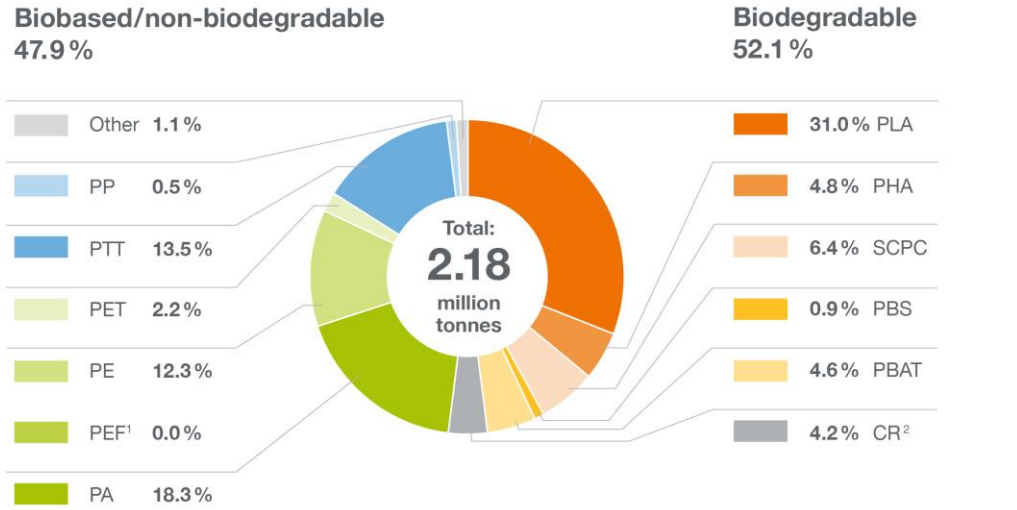
Global production of bioplastics 2023





APC Aliphatic polycarbonates
CP Casein polymers
CR Cellulose films
PA Polyamides
PBAT Poly(butylene adipate-co-terephthalate)
PBS Polybutylene succinate and copolymers
PE Polyethylene
PEF Polyethylene furanoate
PET Polyethylene terephthalate
PHA Polyhydroxyalkanoates
PLA Polylactic acid
PP Polypropylene
PTT Polytrimethylene terephthalate
SCPC Starch blends

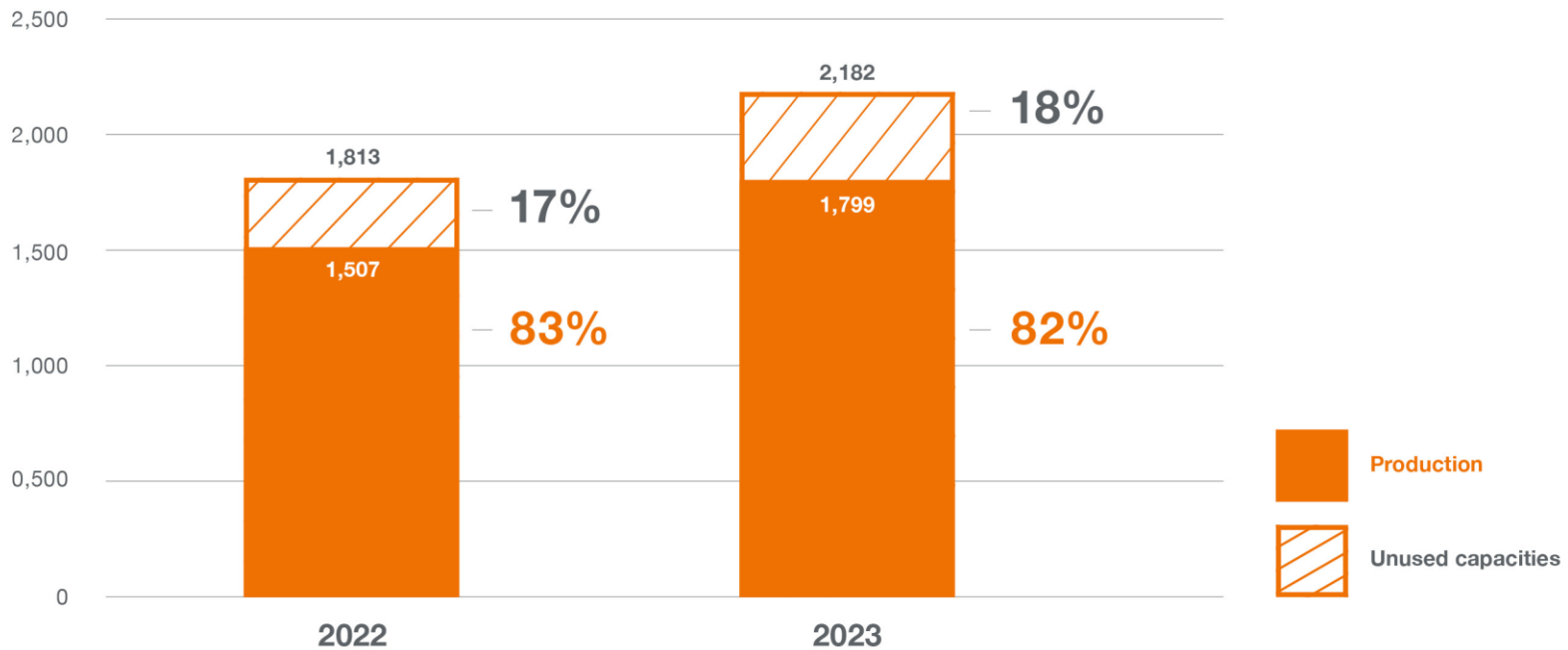
Global production capacities of bioplastics 2023



¹ PEF is currently in development and predicted to be available in commercial scale in 2024. ² regenerated cellulose films

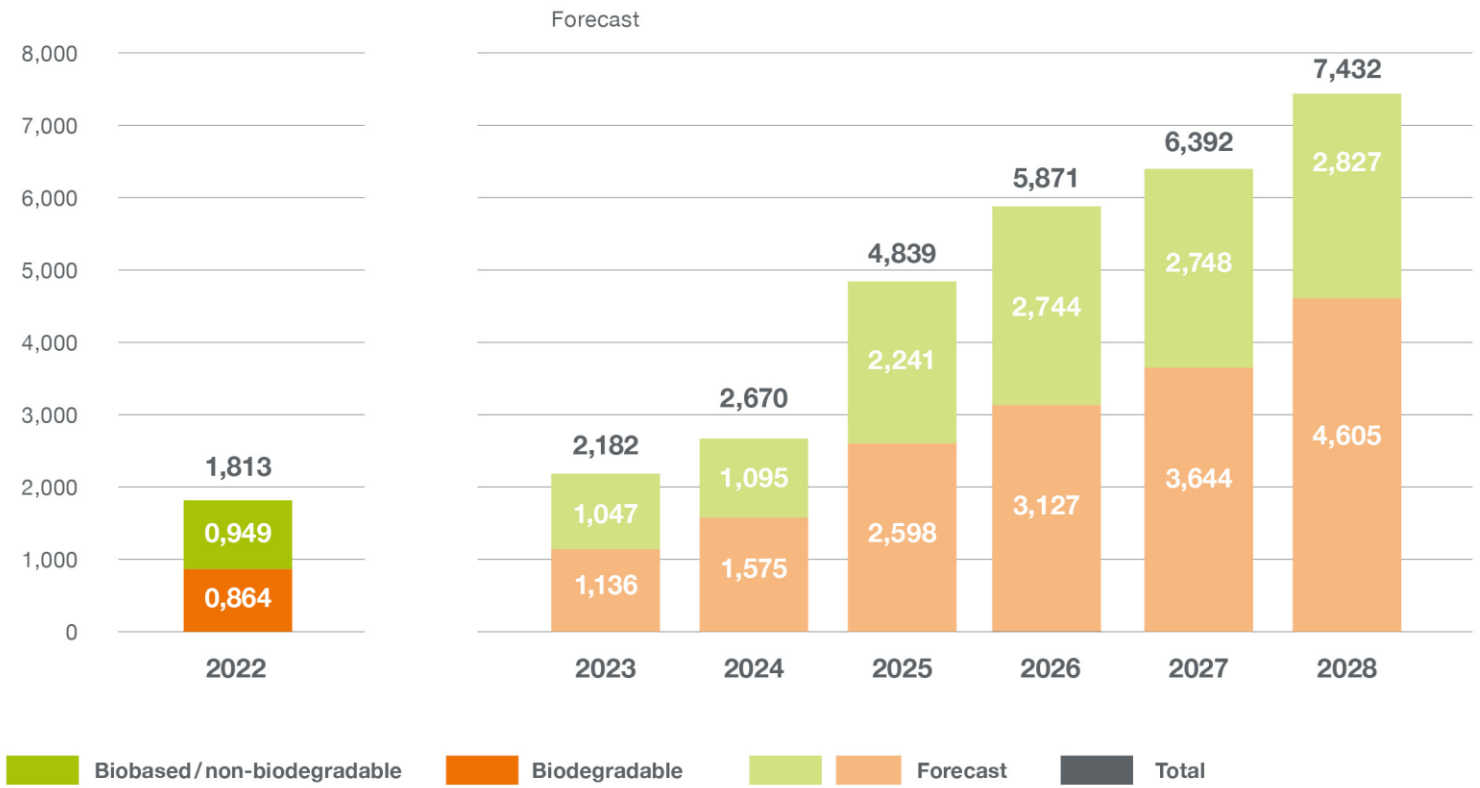
Utilisation rates of bioplastics 2023

in 1,000 tonnes

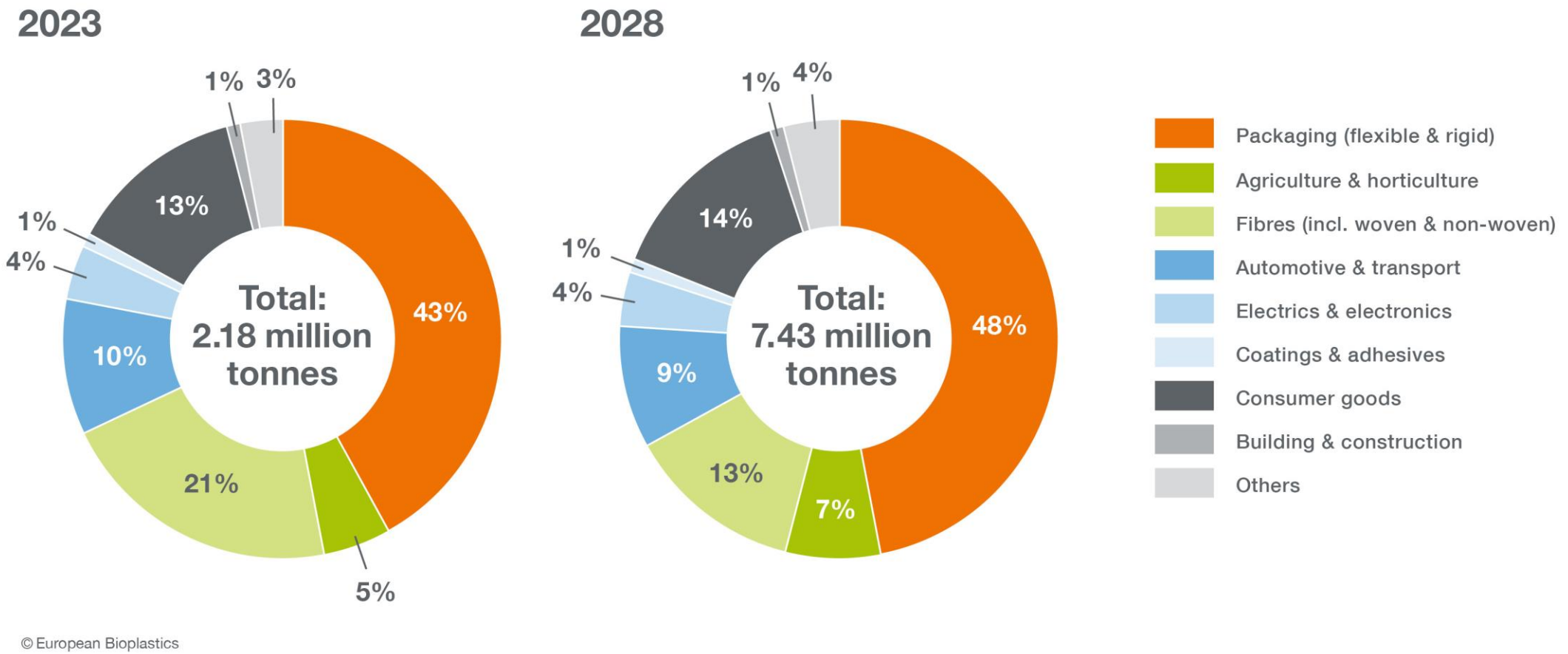


Global production capacities of bioplastics

in 1,000 tonnes



Global production capacities of bioplastics (by market segment)



Myths and Facts

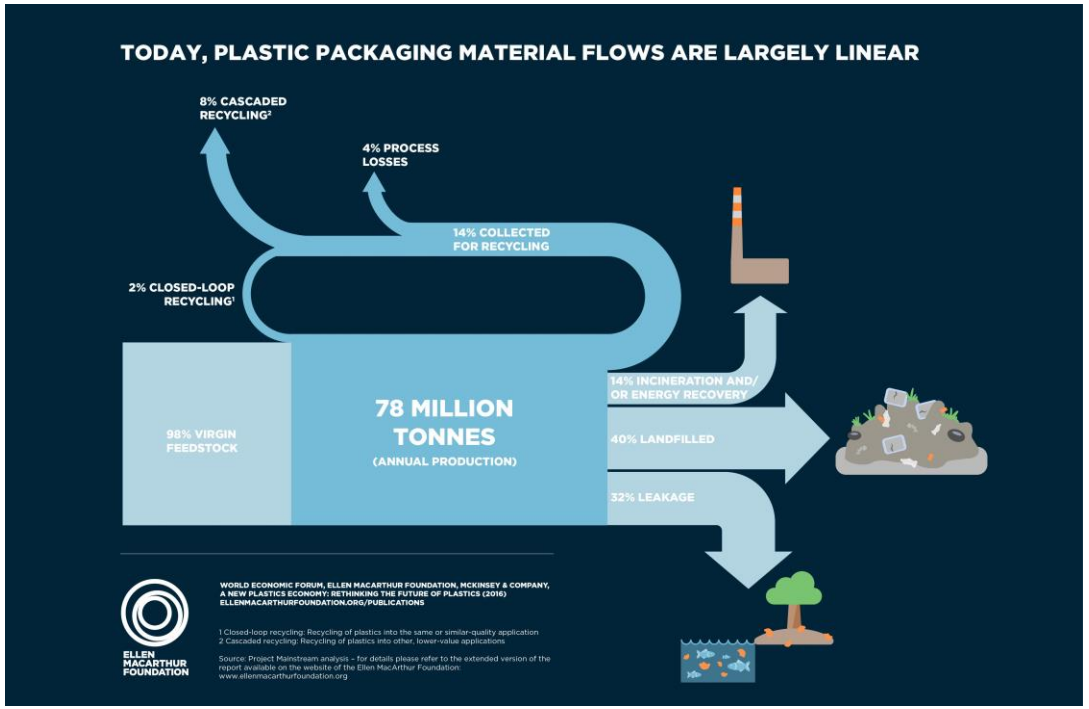
Myths and facts (about bioplastics)

Myth

- Mechanical recycling is the silver bullet

Fact(s)

- Huge amounts of plastic packaging waste is not and will not be recycled



Myths and facts (about bioplastics)

Myth

- Bio(degradable)plastics disturb mechanical recycling

Fact(s)

- Bioplastics production capacities below 0,5% of overall plastic production
- 48% bio-based durable and recyclable (mostly "drop-ins")
- 52% biodegradable products (e.g., biowaste bags) intended for biowaste collection
- Pre-sorting always necessary to avoid contamination and widely available (NIR)
- Potential contamination rate is near zero
- Contamination rates of up to 3% rarely pose a problem

Myths and facts (about bioplastics)

Myth

- Biodegradable plastics certified according to EN 13432 need only to prove 90% biodegradation.
- That means that up to 10% need not to biodegrade and are liable to remain as potentially toxic microplastics in the compost.

Fact

- It is not only the polymer that is certified but the final product, including additives, inks, glues, etc.
- The certification includes a vigorous eco-toxicity test that guarantees that no harm is done to flora and fauna.
- The 90% biodegradation rate refers to the conversion of the carbon (C) into carbon dioxide (CO_2).
  However, given that up to 40% of the C is converted into new biomass, the requirement of 90% CO_2 conversion poses a high barrier, as this can only be achieved if part of the newly built biomass is mineralized again.

Myths and facts (about bioplastics)

Myth

- Biodegradable plastics certified according to EN 13432 need 12 weeks to disintegrate in industrial composting facilities.
- But because modern composting facilities mostly allow for an active rotting phase of only between 3 to 6 weeks, the tested materials or product will not biodegrade in time.

Fact(s)

- This timeframe sets the boundaries for the maximum thickness of a product to be certifiable according to EN 13432.
- However, the thickness of most products sent in for testing and certification is far below the certifiable thickness.
- In the case of biowaste bags, the thickness is often in the range of 5-10% of the certifiable maximum thickness. This means that they will completely biodegrade in just a few weeks.

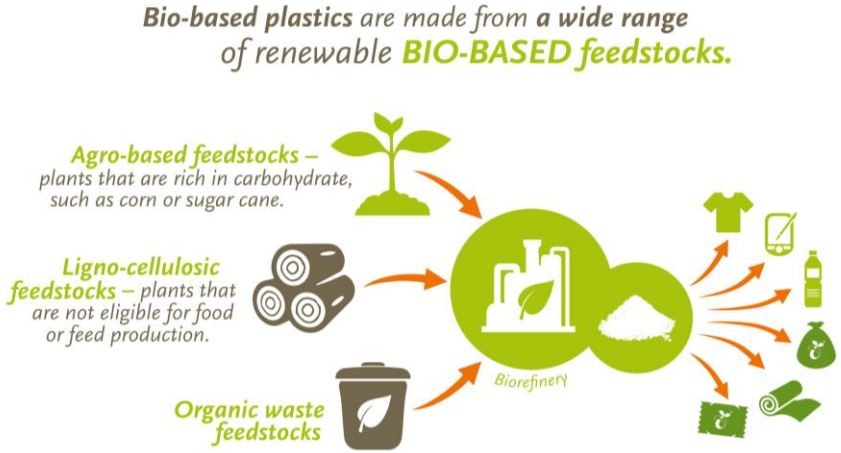
Myths and facts (about bioplastics)

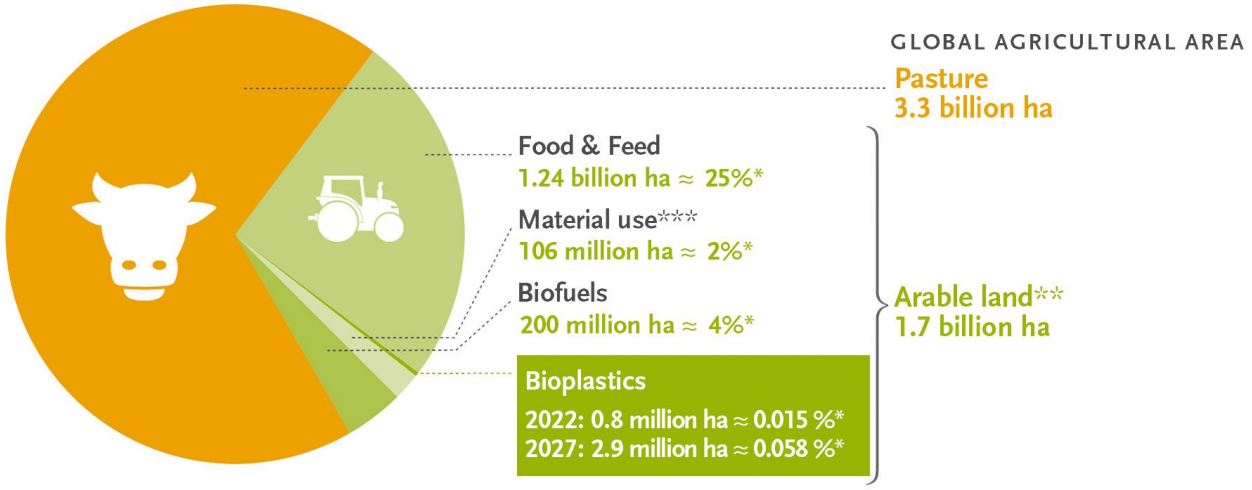
Myth

- Bioplastics made from food crops (1st gen. feedstock) pose a threat to the world-wide supply of food and feed.

Fact(s)

- Impact of making bio-based plastics from renewable feedstock infinitesimally small

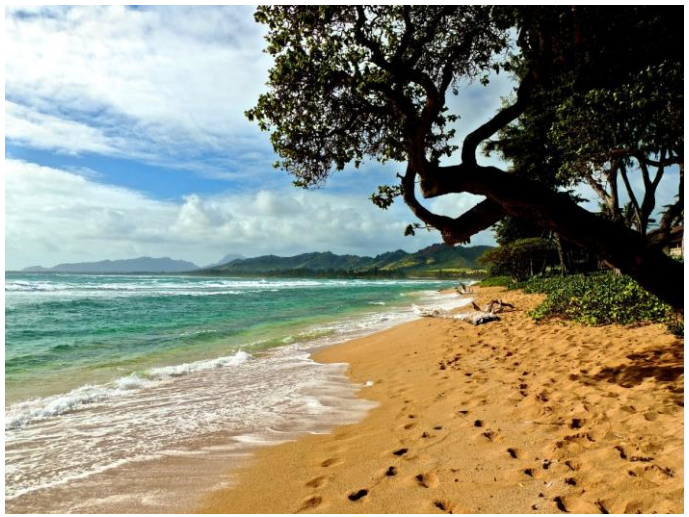




Myths and facts (about bioplastics)

Myth

- Bioplastics – often perceived as biodegradable in general, i.e. in any environment – are a solution to plastic litter, especially in the marine environment.



Fact(s)

- Plastics, be they biodegradable or not, do not belong in the environment (littering).
- Packaging should always be designed for reusability or recyclability (i.e., mechanic, organic and chemical).
- Biodegradability should always refer to a specific environment, testing conditions (e.g., temperature, humidity, time-frame, etc.) and be third-party certified in accordance to acknowledged standards and norms (with pass/fail criteria!).

Myths and facts (about bioplastics)

Myth

- LCAs and the PEF method are the "gold standard" to assess the environmental impact of a product

Fact(s)

- No (correct) uptake of biogenic carbon
- Burdens and potential impacts from accidents, disasters or conflicts when extracting fossil fuels excluded
- Extensive LUC reporting mandatory only for biobased
- EoL modelling incoherent

- No meaningful or fair comparison between biobased and fossil-based products

Conclusion

- At first glance, the on-going transition from a linear to a circular economy in Europe is liable to hold a range of opportunities for the bioplastics industry.
- Circular by design, bioplastics combine numerous properties that make them virtually predestined for a circular economy.
- Their advance, however, is slowed down by several factors. These include, but are not limited to, a lack of knowledge, persistent misinformation, communicational challenges, and, eventually, poor legislative framework.
- The way the bioplastics industry will be able to tackle these challenges in the coming years will determine the destiny of bioplastics in the near and distant future.

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