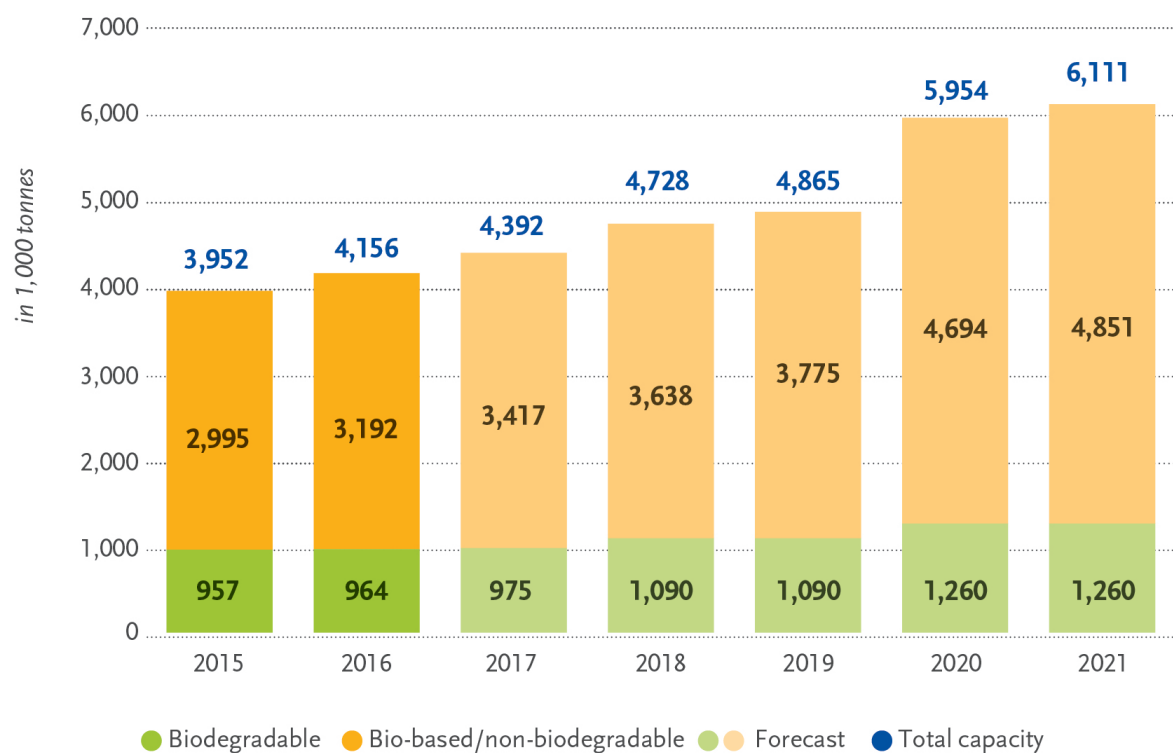


REPORT

European Bioplastics

Bioplastic market data 2016

Global production capacities of bioplastics 2016 - 2021



Source: European Bioplastics, nova-Institute (2016).

More information: www.bio-based.eu/markets and www.european-bioplastics.org/market

Dynamic market growth

Currently, bioplastics represent about one percent of the about 320 million tonnes of plastic produced annually. But as demand is rising and with more sophisticated biopolymers, applications, and products emerging, the market is already growing by about 20 to 100 per cent per year.

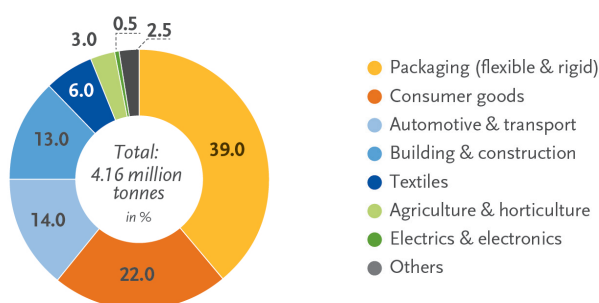
According to the latest market data compiled by European Bioplastics in cooperation with the research institute nova-Institute, global production capacity of bioplastics is predicted to grow by 50 percent in the medium term, from around 4.2 million tonnes in 2016 to approximately 6.1 million tonnes in 2021.

Development of innovative materials

Bio-based, non-biodegradable polymers, such as polyurethanes (PUR) and drop-in solutions, such as bio-based PE and bio-based PET, are the main drivers of this growth, with PUR making up around 40 percent and PET over 20 percent of the global bioplastics production capacities. More than 75 percent of the bioplastics production capacity worldwide in 2016 was bio-based, durable plastics. This share will increase to almost 80 percent in 2021.

Production capacities of biodegradable polymers, such as PLA, PHA, and starch blends, are also growing steadily from around 0.9 million tonnes in 2016 to almost 1.3 million tonnes in 2021. PHA production will almost quadruple by 2021 compared to 2016, due to a ramp-up of capacities in Asia and the USA and the start-up of the first PHA plant in Europe.

Global production capacities of bioplastics (by market segment)



Source: European Bioplastics, nova-Institute (2016).
More information: www.bio-based.eu/markets and www.european-bioplastics.org/market

Applications and market sectors

Bioplastics are used in an increasing number of markets, from packaging, catering products, consumer electronics, automotive, agriculture/horticulture and toys to textiles and a number of other segments.

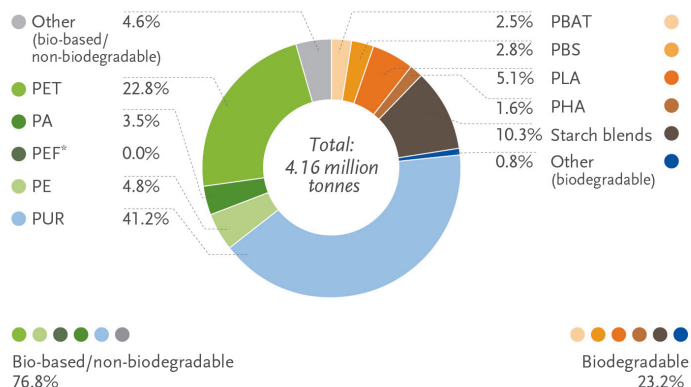
Packaging remains the largest fields of application for bioplastics with almost 40 percent (1.6 million tonnes) of the total bioplastics market in 2016. The data also confirms a decisive increase in the uptake of bioplastic materials in many other sectors, including consumer goods (22 percent, 0.9 million tonnes) and applications in the automotive and transport sector (14 percent, 0.6 million tonnes) and the construction and building sector (13 percent, 0.5 million tonnes), where technical performance polymers are mainly being used.

Market drivers and development

The increase in the use of bioplastics in all market segments is driven by the increasing demand for sustainable products by consumers and brands alike due to a growing awareness of the impact on the environment and the need to reduce the dependency on fossil resources as well as the continuous advancements and innovations of the bioplastics industry in new materials with improved properties and new functionalities.

Today, there is a bioplastic alternative for almost every conventional plastic material and corresponding application. Depending on the material, bioplastics have the same properties as conventional plastics and offer additional advantages, such as a reduced carbon footprint or additional waste management options such as industrial composting.

Global production capacities of bioplastics in 2016 (by material type)

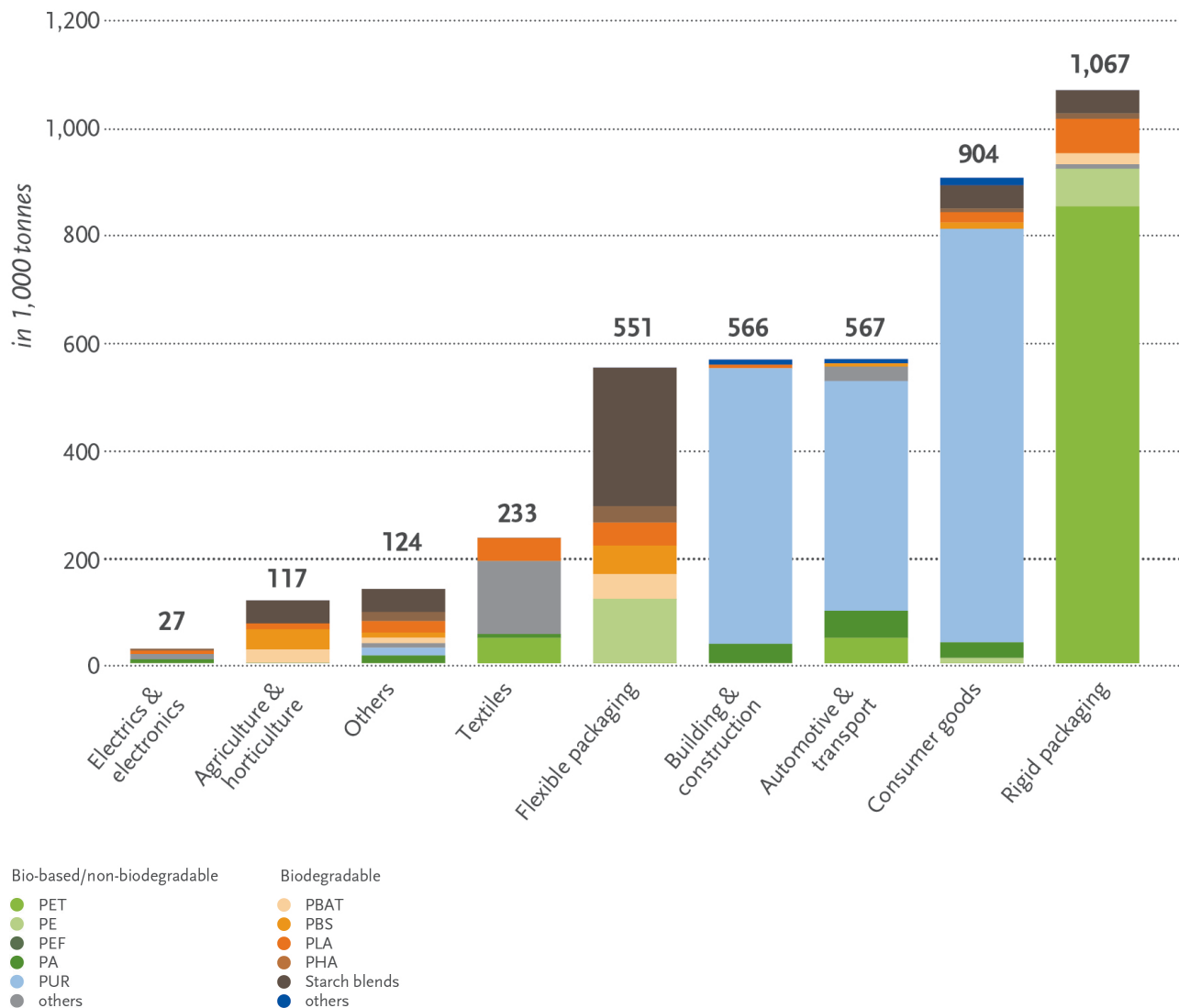


*PEF is currently in development and predicted to be available in commercial scale in 2020.

Source: European Bioplastics, nova-Institute (2016).
More information: www.bio-based.eu/markets and www.european-bioplastics.org/market

The bioplastics industry has come up with numerous innovative technical and material solutions that offer new material properties for an improved performance, including enhanced barrier properties, increased material strength, and improved optical properties.

Global production capacities of bioplastics in 2016 (by market segment)



Source: European Bioplastics, nova-Institute (2016). More information: www.bio-based.eu/markets and www.european-bioplastics.org/market

Economic and social development

With a growing number of materials, applications, and products, the number of manufacturers, converters and end-users also increases steadily. Significant financial investments have been made into production and marketing to guide and accompany this development. Legal framework conditions provide incentives for the use of bioplastics in several countries worldwide, including some European Member States, providing stimulus to the market.

The latest market data does not only demonstrate the contributions of the industry on moving towards a sustainable

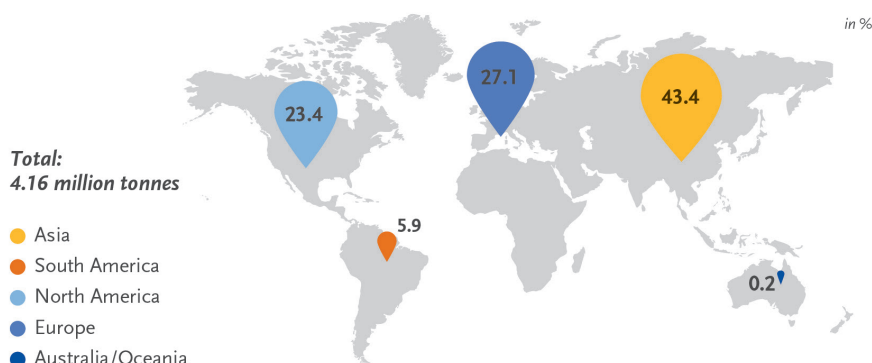
future with a reduced environmental impact. The forecast also predicts the budding bioplastics industry to unfold an immense economic potential over the coming decades. According to a recent job market analysis conducted by EuropaBio (2016), the European bioplastics industry could realise a steep employment growth. In 2013, the bioplastics industry accounted for around 23,000 jobs in Europe. With the right framework conditions in place, this number could increase more than tenfold by 2030, with up to 300,000 high-skilled jobs being created in the European bioplastics sector.

Regional development

Europe is a major hub for the entire bioplastics industry; it ranks highest in the field of research and development and is the industry's largest market worldwide.

With a view to the actual production of bioplastics and regional capacity development, Asia is and will further expand its role as major production hub. In 2016, more than 43 percent of bioplastics were produced in Asia. Around a quarter of the global bioplastics production capacity is located in Europe.

Global production capacities of bioplastics in 2016 (by region)



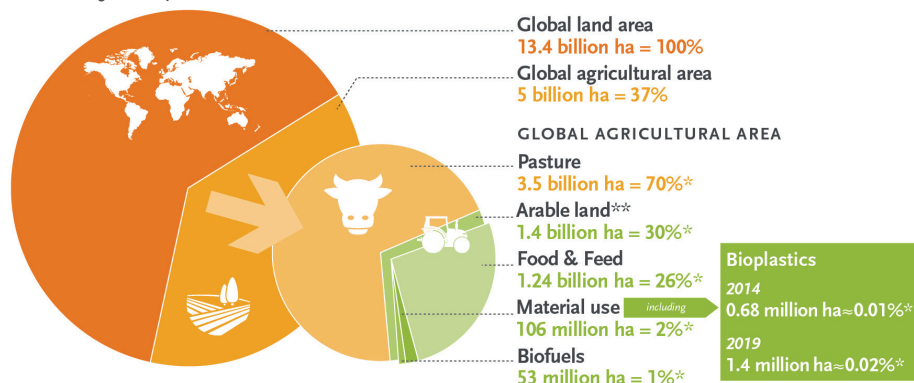
Source: European Bioplastics, nova-Institute (2016).

More information: www.bio-based.eu/markets and www.european-bioplastics.org/market

Land use

The land used to grow the renewable feedstock for the production of bioplastics amounted to approximately 0.68 million hectares in 2014, which accounted for only 0.01 percent of the global agricultural area of 5 billion hectares, 97 percent of which were used for pasture, feed, food, other material uses, bioenergy, and biofuels. This clearly shows that there is no competition between the renewable feedstock for food, feed, and the production of bioplastics.

Land use for bioplastics 2014 and 2019



Source: European Bioplastics, Institute for Bioplastics and Biocomposites, nova-Institute (2015).

More information: www.bio-based.eu/markets and www.downloads.ifbb-hannover.de

* In relation to global agricultural area
** Also includes approx. 1% fallow land

About the market data report

The market data update 2016 has been compiled in cooperation with the market experts of the nova-Institute (Hürth, Germany). The data for the global production capacities of bioplastics is based on the market study "Bio-based Building Blocks and Polymers" by nova-Institute (2016), which looks at the entire scope of bio-based polymers, including cellulose acetate (CA) and bio-based thermosets such as epoxies and EPDM, which are not included in the scope of new economy bioplastics from European Bioplastics. For more information on the study and full market data report, please go to www.bio-based.eu/markets.

More information can be found on <http://www.european-bioplastics.org/market/>

The market data graphs are available for download on <http://www.european-bioplastics.org/news/publications/>

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January 2017