

The bioeconomy: a brief introduction



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Bioeconomy: crucial for a healthy and wealthy economy in Europe

A key reason that the bioeconomy is gaining increasing attention is that **existing production practices contribute to serious environmental and climate problems**. Ongoing fossil fuel extraction releases more carbon in the atmosphere, contributing to the well-known greenhouse effect.

Bioeconomy offers **opportunities to address these and other challenges**.

- 1 Firstly, bio-based products (made completely or partially from renewable biomass) can make significant contributions to reducing carbon emissions and mitigating climate change.
- 2 Secondly, shifting towards using more bio-based feedstocks, we reduce Europe's dependency on the import of fossil resources, making us less vulnerable to abrupt changes on the world market or possible conflicts.
- 3 Thirdly, by using more domestic biomass for more applications, we create outlets for farmers and foresters, thus increasing their income and improving rural development with more added value and jobs

Bioeconomy: an important economic sector in Europe

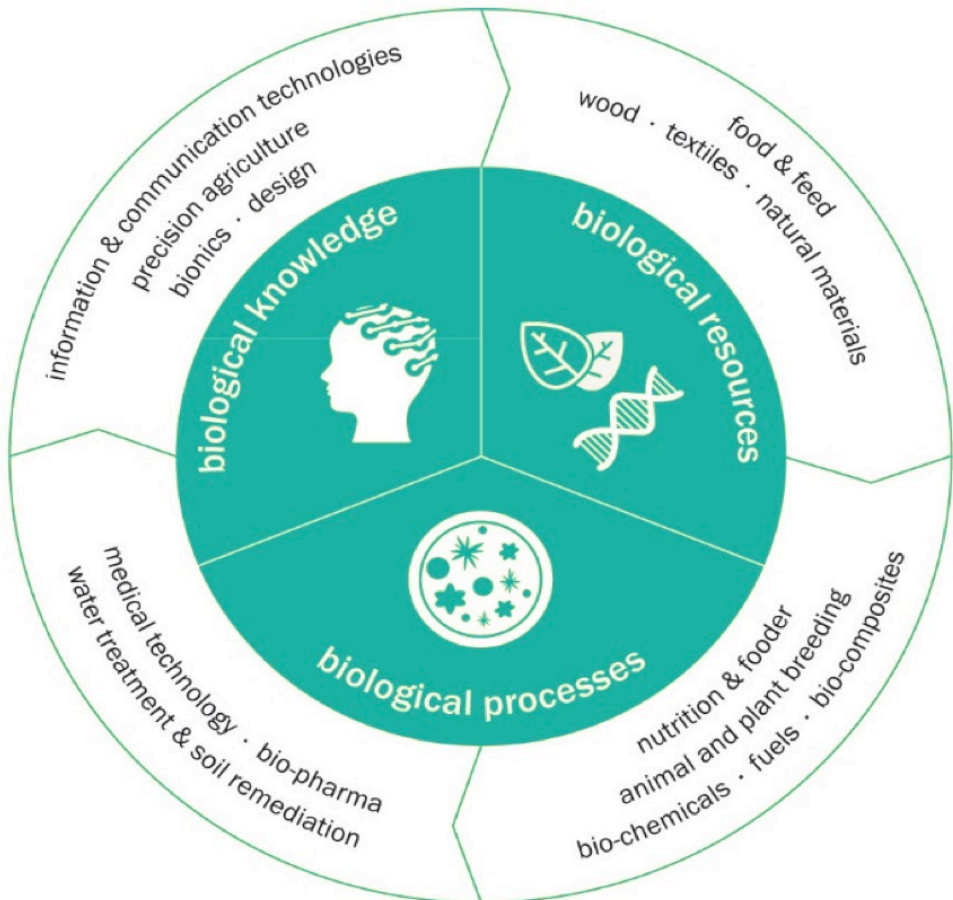
There are multiple definitions of bioeconomy. According to the European Commission, the bioeconomy includes the **production of renewable biological resources** (also called “biomass”), **and the conversion of these resources and waste streams into products** such as food, feed, bio-based products and bioenergy (in Germany, another sectoral categorization of the bioeconomy is also used, see page 4).

Or, in short, the term bioeconomy describes everything that we produce with renewable biomass.



The EC distinguishes ten potential areas for exploitation within the bioeconomy:

- | | |
|--|--|
| 1 Agriculture | 6 Wood products and furniture |
| 2 Forestry | 7 Paper |
| 3 Fishing and aquaculture | 8 Bio-based chemicals and pharmaceuticals, plastics and rubber |
| 4 Food, beverages and other agro-manufacturing | 9 Liquid biofuels |
| 5 Bio-based textiles | 10 Bioelectricity |



Non-exhaustive overview on sectors encompassed by the bio-economy, Source: German Bioeconomy Council (2016)

Bioeconomy is featuring high on the political agenda

Stronger development of the bioeconomy will help the EU accelerate progress towards a circular and low-carbon economy. It will help modernise and strengthen the EU industrial base, creating new value chains and greener, more cost-effective industrial processes, while protecting biodiversity and the environment.

In October 2018 the EC unveiled an updated [Bioeconomy Strategy](#) that seeks to accelerate the establishment of a sustainable European bioeconomy while maximising its contribution towards Europe's 2030 Agenda, the UN Sustainable Development Goals (SDGs), as well as the Paris Agreement on climate change.

Bioeconomy furthermore features prominently in other European policies and strategies including the [European Green Deal](#), the [Circular Economy Action Plan](#) and the [EU Common Agricultural Policy](#) (CAP).

Also at the national level, an increasing number of Member States is publishing strategies and other policy initiatives dedicated to the bioeconomy.

A contributor to systemic change and an opportunity for rural areas

The **European Green Deal** is a set of EC policy initiatives with the overarching aim of making Europe climate neutral in 2050. Initially a strategy for economic and social growth it is also at the core of Europe's Covid-19 recovery strategy. The bioeconomy, as a catalyst for systemic change, tackles the economic, social and environmental aspects of the Green Deal, seeking new ways of producing and consuming resources while respecting our planetary boundaries and moving away from a linear economy based on extensive use of fossil and mineral resources.

Europe's rural areas are facing key issues such as low population density, remoteness, poor infrastructure or dependence on the primary sector. As rural areas are rich in biological resources, **bioeconomy is one of the sectors that can turn these rural challenges into opportunities.**

Sources: European Commission (2020). [*How the bioeconomy contributes to the European Green Deal*](#) and European Rural Parliament (2017), [*European Rural Manifesto*](#).

Bio-based products are used in our everyday life

Bio-based products are made – completely or partially – from biogenic material, which means they are made from renewable resources (also called “biomass”). The most frequently used types of biomass are sugar, starch, plant oils, wood and natural fibres. Partially bio-based products can also contain minerals or petrol.

Today, **a wide range of products exists that are used daily in households, which are at least partly made from renewable resources**, even though most consumers are not aware that these products are bio-based. This is for example often the case with construction materials, packaging, detergents, cosmetics and textiles. One of the most common type of bio-based products is paper, although bio-based products can also include pens, inks, furniture, and gardening tools, amongst others.

Reflecting the wide variety of applications, and the raw materials used for production, the benefits provided by bio-based products are manifold and diverse.



Bio-based products are used in our everyday life

Examples of biomass feedstock



Wood



Sugar



Waste

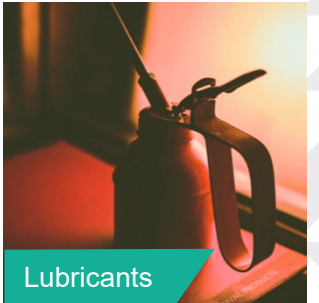
Examples of bio-based products



Catering



Cleaning



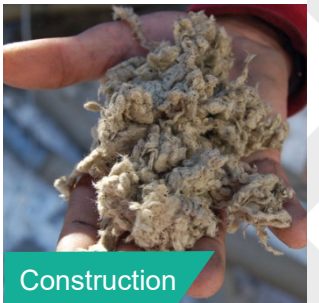
Lubricants



Greenery



Coatings



Construction

We use a lot bio-based products in our everyday life already

The LIFT project (May 2019- April 2020) produced 11 factsheets showing key results, findings and outcomes of EU- funded “CSA” projects on bioeconomy. A few examples:

- Under the title [Bio Art Gallery](#), the BIOVOICES project published a catalogue presenting 60 artistic pictures that associate commonly known feedstock (tomatoes, coffee, apples, oranges, etc.) with their surprising bio-based applications.
- The promotional video [A Bio-Based Day](#), produced by the BIOBRIDGES project, follows a young lady during her bio-based day, from the wake up to the goodnight, discovering how bio-based products can substitute fossil-based ones in every day's lives.
- In the publication [A journey to the bioeconomy future](#) the BLOOM project packed a suitcase with bio-based products. The suitcase contains items that look and feel like the products we have been using for years, except that they are slightly different: they don't harm the environment.

Source: [LIFT project](#), 2020.

Bio-based products benefiting consumers

Reflecting the wide variety of applications, and the raw materials used for production, the benefits provided by bio-based products need to be assessed on a case-by-case basis. Five examples of bio-based products which are better performing, longer lasting, recyclable or more economical:

- Enzymes are used instead of harsh chemicals to make **leather soft and cotton fabric** smoother and stinger, reducing the amount of water needed and chemical waste released into the environment
- Renewable resources can now be used to make durable, **lightweight bio-based car plastics and tyres**, which reduce fuel consumption and CO2 emissions.
- **Biodegradable mulching films** made from biomass enable farmers to use less herbicides in growing vegetables and, as they biodegrade in the soil, prevent the loss of soil which occurs when removing traditional non-biodegradable plastic films.
- Bio-based materials are increasingly used in high-value engineering solutions. They can for example strengthen **shock-proof screens for smartphones or tablets**.
- Innovative textile fibres from biomass make **renewable carpets** with vibrant colours and **soft touch apparels**, replacing fossil-based synthetic fibres.

Source: EuropaBio, 2015, Buying into bio-based.

Sustainable bio-based economy: reconciling multiple societal priorities

The bioeconomy offers an opportunity to **reconcile economic growth with environmentally responsible action**. However consideration for the latter is not always taking central stage.

Critics stress that the dominant view of the bioeconomy **ignores the necessity of reducing high levels of consumption** and ever growing demand for products. Resulting in more and more land being converted to multiple-use 'flex crops', often at the expense of other food crops. This leads to the **commodification of nature**. Furthermore, it perpetuates structures that prioritise market growth over environmental health and human wellbeing.

Overall, it comes to the question if and how ethical premises, human benefit considerations and the sustainable protection of a modern, industrially driven economy can be reconciled by the bioeconomy in a broadly acceptable way.



Allthings.BioPRO project is engaging citizens in shaping the bioeconomy

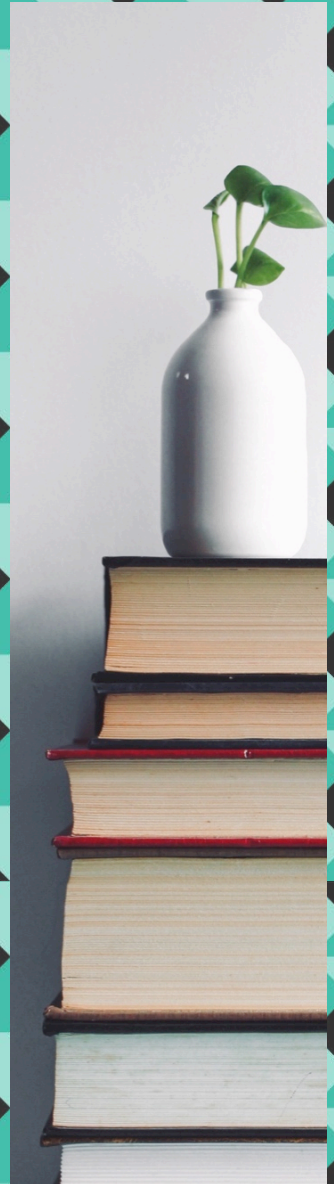
Citizens need to have a say in political decisions and agenda-setting processes in the bioeconomy. On the other hand, the **bio-based industry needs the input of citizens and consumers**, to make sure that the products developed are in tune with consumers' requirements and expectations.

The Allthings.bioPRO project was designed to address a major gap in encouraging citizen engagement and to **create a deeper understanding of the bioeconomy**. The project aims to engage citizens in a debate on the bioeconomy, and seeks to learn more about their expectations regarding quality, functionality and sustainability of bio-based products. In the project citizen play a central role creating and deploying an **innovative serious game and a smartphone app**.



Further reading

- [BLOOM key messages](#) for different aspects of the bioeconomy, sustainable development and climate change in an easy to understand and accessible way.
- [INNPROBIO factsheets](#) with information about the most relevant issues concerning bio-based products and services.
- [Biomass for the Circular Economy](#). Everything you wanted to know about biomass but were afraid to ask.
- LIFT factsheet on [Awareness Raising](#)
- LIFT factsheet on [Stakeholder Engagement and Co-creation](#)



Beyond bioeconomy in general, the Allthings.bioPRO factsheets series covers the project's four missions, tangible themes that are familiar to the wider public, as follows:

- Jobs and Careers
- Kids and Schools
- Fashion and Textiles
- Food Packaging

The factsheets are living documents, that are refined and expanded over the duration of the project (September 2020 - August 2023), taking into account feedback collected during engagement with citizens and experts.

The latest editions of the factsheets can be found at the project website, www.allthings.bio.

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