

## PA #14 The German Bioeconomy and supporting knowledge on the transition to a local circular bioeconomy

Bioeconomy covers all industrial and economic sectors that use renewable biological resources to manufacture products and provide services using innovative biological and technological knowledge and processes. This includes all industries that produce, process or use biological resources in any form, such as agriculture/food; forestry, energy, fisheries/aquaculture, chemicals and pharmaceuticals, industrial biotechnology, cosmetics, paper and textiles, and environmental protection.

In Germany, 3.1-3.6 million people are employed in the bioeconomy. This corresponds to about 9% of all employed persons in the total economy and generates between 165 and 265 billion euros. This corresponds to between 5 and 6% of Germany's GDP. The potential of bioeconomy can also be seen in the number of patents, which exceeds 4,000 per year. In percentage terms, most of these are in the following sectors: 30 % pharmaceuticals, 30% chemicals, 25% mechanical engineering and 9% textiles, clothing and leather.

Employment by sector in Germany (2021)  
(number of people employed)

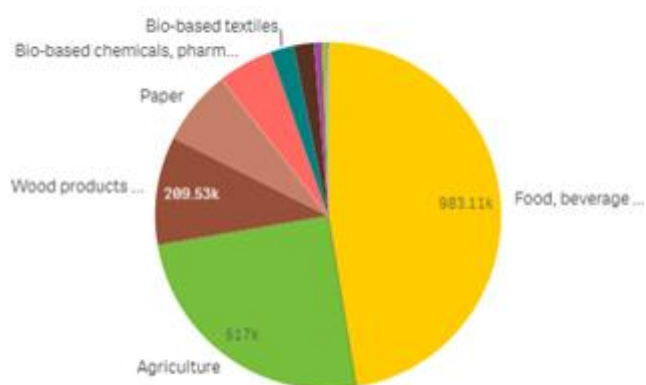


Figure 1: Employment by sector in Germany (2021)

Value added by sector in Germany (2021)  
(million €)

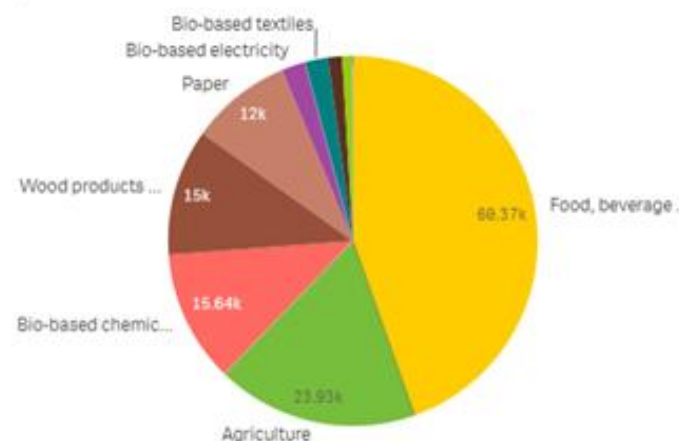


Figure 2: Value added by sector in Germany (2021)

Source: [Jobs and wealth in the EU bioeconomy \(europa.eu\)](https://europea.eu/jobs-and-wealth-in-the-eu-bioeconomy) Lasarte-López, Jesús; Ronzon, Tévécia; M'barek, Robert; Carus, Michael; Tamošiūnas, Saulius (2023): Jobs and wealth in the EU bioeconomy / JRC - Bioeconomics. European Commission, Joint Research Centre (JRC) [Dataset] PID: <http://data.europa.eu/89h/7d7d5481-2d02-4b36-8e79-697b04fa4278>

Agriculture and the manufacture of food, beverage and tobacco are the dominant sectors of the European bioeconomy. The main Bioeconomy sectors in Germany are the food and agriculture sector employing together around 1.5 mill people with an added value of €84,3 billion. Other important sectors are the wood production and paper industry. An increasing effort was being made in the economic field towards a sustainable use and production to generate CO<sub>2</sub>-neutral emissions towards a sustainable future.

The current national Bioeconomy Strategy centers on “sustainability” and “climate actions” as the key issues of economic action to protect the biosphere and life on earth.

Symmerized in six common strategic goals: 1) Develop bioeconomy solutions for the 2030 Agenda for Sustainable Development 2) Recognise and harness the potential of the bioeconomy within ecological boundaries 3) Enhance and apply biological knowledge 4) Establish a sustainable raw material base for industry 5) Promote Germany as the leading location for innovation in the bioeconomy 6) Involve society and strengthen national and international collaboration.



The strategy describes policy areas, in which the Federal Government will implement specific actions over the coming years, in order to improve the framework conditions for the bioeconomy. These are as follows: reducing pressure on land use; ensuring the sustainable production and supply of biogenic raw materials; expanding and developing the supply chains and networks of the bioeconomy; designing instruments to establish and bring bio-based products, processes and services to the market; ensuring policy coherence; making use of the opportunities offered by the bioeconomy for the development of rural areas; and taking advantage of digital technology for the bioeconomy.

The German government defines the bioeconomy as the production, use and application of biological resources, processes and systems to provide products, processes and services across all economic sectors as part of a future-oriented economy.

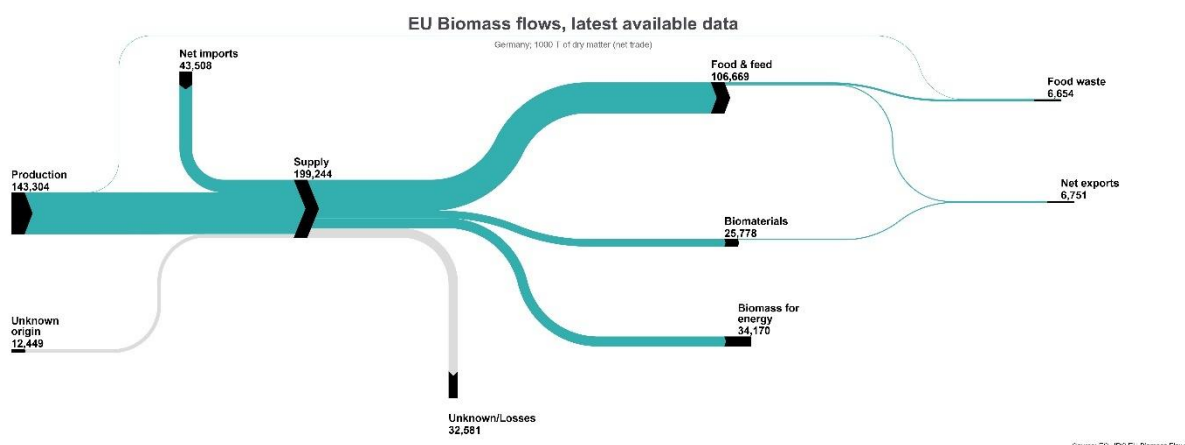


Figure 3: EU Biomass Flows

Source: [Jobs and wealth in the EU bioeconomy \(europea.eu\)](https://europea.eu) Lasarte-López, Jesús; Ronzon, Tévécia; M'barek, Robert; Carus, Michael; Tamošiūnas, Saulius (2023): *Jobs and wealth in the EU bioeconomy / JRC - Bioeconomics*. European Commission, Joint Research Centre (JRC)  
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The National Policy Strategy on Bioeconomy relates to the raw materials used by industry and the need for a sustainable and circular economy based on the use of biogenic resources.

The current national bioeconomy strategy focuses on "sustainability" and "climate action" as key issues for economic activity. It links the ecologically sustainable consumption of natural resources with economic prosperity and the right to future development of future generations.

The strategy builds on the National Research Strategy Bioeconomy 2030 and the National Policy Strategy Bioeconomy in order to bundle the various political strands into a coherent framework. The National Bioeconomy Strategy is intended to promote Germany's self-declared leading role in the bioeconomy and create the technological and economic conditions for this.

With the Strategy, the German Federal Government wants to mirror global responsibility for future generations. Biological knowledge and advanced technology are the main pillars of the National Research Strategy Bioeconomy 2030. An essential part of research is technical innovation in combination with social, political and economic research to accompany the profound societal transformation process. The research focuses on diverse organisms and biological processes.

The National Policy Strategy on Bioeconomy relates to the raw materials used by industry and the need for a sustainable and circular economy based on the use of biogenic resources. It can be summarized in six common strategic goals: 1) Develop bioeconomy solutions for the 2030 Agenda for Sustainable Development 2) Recognize and harness the potential of the bioeconomy within ecological boundaries 3) Enhance and apply biological knowledge 4) Establish a sustainable raw material base for industry 5) Promote Germany as the leading location for innovation in the bioeconomy 6) Involve society and strengthen national and international collaboration.

For each of these strategic goals, research is the key issue for state funding, which will focus on: Enhancement of biological knowledge, converging technologies and transdisciplinary cooperation, scale-up and international research collaboration.





*Figure 4: Village nearby river in Leipzig, Germany.*

*Source: Photo by Nguyet Ha (<https://www.pexels.com/photo/bare-trees-around-river-in-village-8113693/>)*



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