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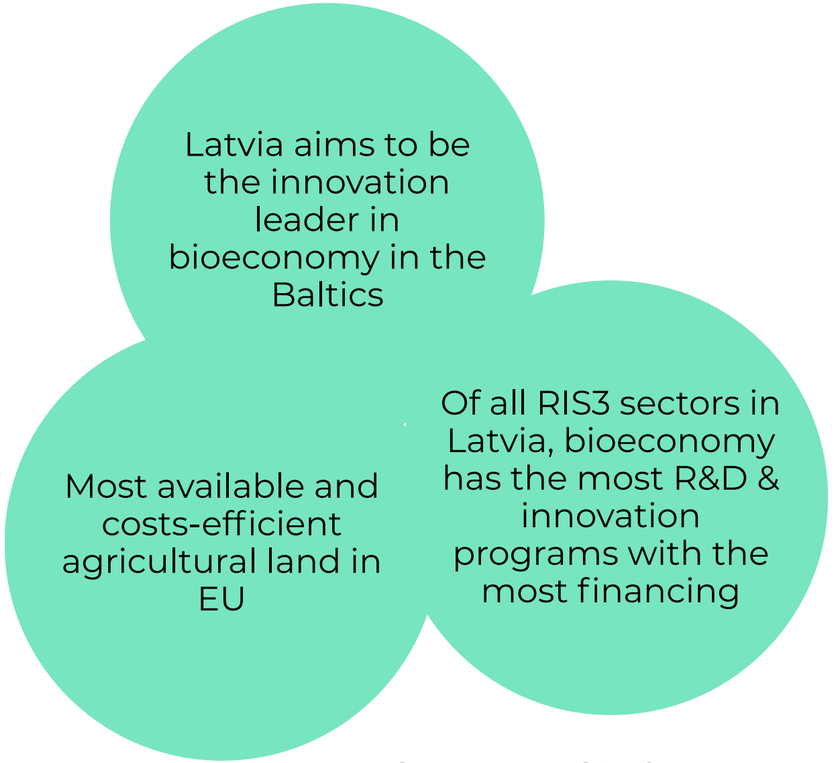
Knowledge-intensive BIOECONOMY

BIOECONOMY AT A GLANCE

It is a part of the economy that uses renewable biological resources to produce **food, feed, industrial products, energy**, integrating knowledge-intensive approaches to create high-value-added products.

- bioeconomy sector merges traditional sectors such as **forestry, agriculture, food production** with innovative technologies and approaches.
- sector development relies on **collaboration** between science and business, increased **investment in innovation**, and the **sustainable use of resources**
- A new focus is the development of new materials for the military and aerospace industries, promoting the country's competitiveness and security.
- 18.04.2024. **cooperation memorandum** was signed about development of **new biorefinery ecosystem** in Latvia.

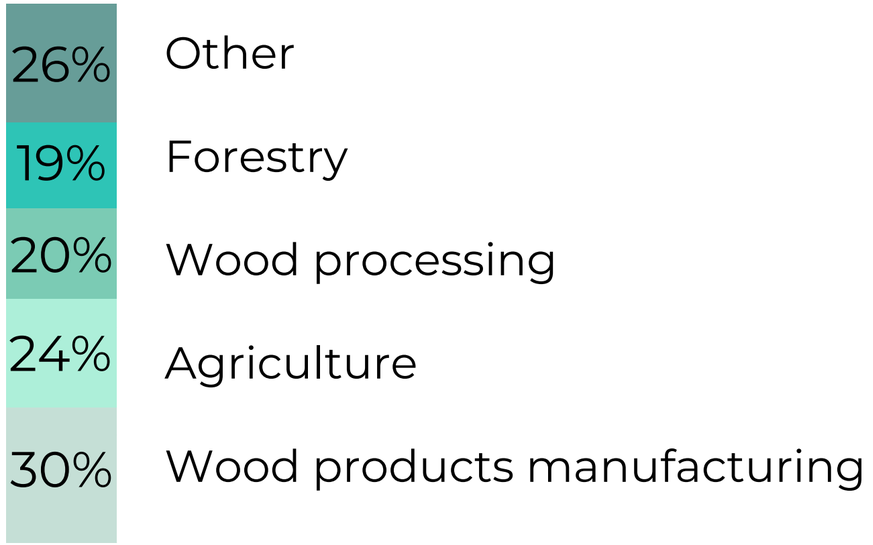


Source: EM RIS3 Information Report

BIOECONOMY SECTORS AND R&D POTENTIAL

- sustainable and efficient agriculture,
- development of innovative food products and animal feed,
- food safety,
- sustainable forestry and wood supply systems,
- research in the bioresources/biotechnologies
- regional development and other citizen science initiatives.

Bioeconomy sectors



Source: EM RIS3 Information Report

BIOECONOMY SECTOR GROUPS

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Traditional sectors

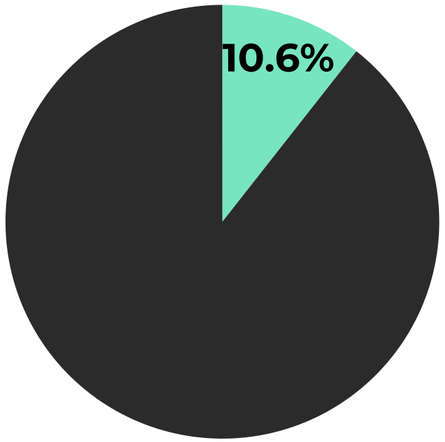
Primary production of bioresources	**Processing of bioresources** *(sectors are mainly dependent on bioresources)*	**Processing of bioresources** *(in sectors bioresources are the alternative for other raw materials)*	**Use of bioresources for services**
• Agriculture, hunting (A01) • Fisheries (A03) • Forestry (A02)	• Processing of food, beverages, and tobacco (C10, C11, C12) • Manufacture of leather and related products (C15) • Manufacture of wood, straw, plaiting materials, paper products (C16, C17) • Manufacture of furniture (C31)	• Manufacture of textiles, wearing apparel (C13, C14) • Manufacture of chemicals and chemical products (C20) • Manufacture of basic pharmaceutical products and pharmaceutical preparations (C21) • Electricity, gas supply, heat supply (D)	• Construction (F) • Catering services (I56) • Accommodation (I55)

Figure 2. Sectoral groups of bioeconomy and NACE sectors

BIOECONOMY IN NUMBERS

The share of bioeconomy sector has an increasing trend over the years as part of GDP

Bioeconomy as % of GDP



116'900

employed in bioeconomy sector

EUR 3.8 B

export amount of bioeconomy sector in Latvia

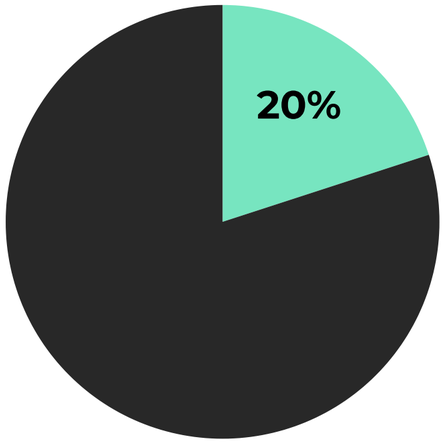
EUR 3.8 B

value added of bioeconomy sector in Latvia

28'264

companies in bioeconomy sector

Bioeconomy export as % of total



Source: EM RIS3 Information Report

HIGH ADDED VALUE OPPORTUNITIES IN LATVIA

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400'000 ha of unused agriculture land

63% of annual forest increase available for harvesting

- under-utilised agriculture land,
- under-harvested forests,
- untapped aquaculture opportunities using vast sea area.

Biorefinery technologies - the processing of biomass into high-value products such as bio-fuels, chemicals and materials.

Synthetic biology - the application of biotechnology to the creation of new organisms and biomaterials that can be a substitute for fossil resources.

Precision agriculture - the use of information technology to optimise agricultural processes and the use of resources.

Bioplastics and bio-composites - the development of environmentally friendly materials made from renewable biological resources.

Enzyme Engineering - developing and optimising enzymes for industrial applications such as biomass processing or food production.

Algae biotechnology - the use of algae for the production of biofuel, biochemicals and biomaterials.

Microbiome research - the study of the role of micro-organisms in ecosystems and their applications in agriculture, health and food production.

Source: EM RIS3 Information Report

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FUTURE PROSPECTS IN BIOECONOMY

- Development of new biomaterials and processing of biomass side streams.
- Development of biotechnology, bioinformatics and synthetic biology.
- Implementation of precision agriculture and digital technologies.
- Development of aquaculture.
- Development of functional food and products with increased nutritional value.
- Promotion of organic plant protection and agroecology.
- Improvement of waste recycling and biomass utilization.

Investment in innovations in bioeconomy

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Innovation-oriented actions

- Establishing a **unique infrastructure** in the Baltic States for research on infectious **diseases in animals** - a project to promote innovation in veterinary medicine and food safety.
- Improving the **regulatory framework** for the construction process of industrially produced **timber buildings** - an initiative to promote sustainable use of resources in construction

The Horizon Europe Widening Participation and Spreading Excellence (WIDERA)

- **Agri-Biocircular Hub** (€ 6 million). It allowed to establish a cross-border network of centers of excellence for smart agriculture and circular bioeconomy, promoting cooperation and knowledge transfer.
- **MarTe project** (€ 4.8 million). It allowed to establish Marine Technology Center of Excellence for cooperation and innovations in marine technologies, especially (e.g. renewable energy, smart ports, marine environmental protection).

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BIOECONOMY SECTOR ECOSYSTEM

Main industrial players and start-ups

LATVIJAS FINIERIS
AKCIJU SABIEDRĪBA

got foods

FIELD and FOREST
ORGANIC FARMING

Fibenol

Dimedium
Full animal health

miss

BIOREFIC™
Biorefinery for the Future

KARAVELA

silvanols
daba dziedē

Simply Food
KEEFA

alojas
sustainable ingredients solutions

GOLDEN FIELDS

asns
INGREDIENT

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BIOECONOMY SECTOR ECOSYSTEM

Main R&D centres and networking partners

UNIVERSITY OF LATVIA

Latvia University of Life Sciences and Technologies

koksnes ķīmijas institūts
institute of wood chemistry

Latvijas KOKRŪPNIECĪBAS federācija

LATVIJAS HIDROEKOLOĢIJAS INSTITŪTS

SILAVA

AGRORESURSU UN EKONOMIKAS INSTITŪTS
AREI

BIOR
PĀRTIKAS DROŠĪBAS, DZĪVNIEKU VESELĪBAS UN VIDES ZINĀTNISKAIS INSTITŪTS

1862
RIGA TECHNICAL UNIVERSITY

LPUF
LATVIJAS PĀRTIKAS UZŅĒMUMU FEDERĀCIJA

DĀRZ KOPĪBAS INSTITŪTS

BSC | BALTIC STUDIES CENTRE

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BIOECONOMY SECTOR TALENT

Education in the sector provided by

study programs:
bioeconomy, sustainable bioeconmy, agriculture, forestry, food technology, biotechnology, environment science, biology, environmental engineering

1500

students enrolled in bioeconomy sector studies

UNIVERSITY OF LATVIA

1862 RTU RĒZEKNE

DAUGAVPILS UNIVERSITY

VIDZEMES AUGSTSKOLA

1862 RIGA TECHNICAL UNIVERSITY

Latvia University of Life Sciences and Technologies

BIOECONOMY SECTOR TALENT

notable professors in the sector

- Dr. sc. ing. **Ilga Gedrovica**, LBTU, food science, alternative proteins, e.g. using earthworms in food.
- Dr. biol. **Matīss Žagars**, VRI, environment and biomass processing technologies, sensor systems (ARSENAL).
- Dr. sc. ing. **Jānis Rižikovs**, LVKĶI, wood chemistry, biorefinery, green chemistry.
- Dr. chem. **Bruno Andersons**, LVKĶI, wood and lignine chemistry, polymers, antioxidants.
- Dr. chem. **Oskars Bikovens**, LVKĶI, biomass recycling innovations, organic synthesis, green chemistry.
- Dr. chem. **Laura Andže**, LVKĶI, wood chemistry, material science, analytical chemistry.
- Dr. sc. ing. **Inese Filipova**, LVKĶI, material science, polymers, compozite materials.
- Ph.D. **Miķelis Kirpļuks**, LVKĶI, biomass, biorefinery, material science, new products from agriculture byproducts.

Management team coordination

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LIAA, as a coordinator, promotes the competitiveness of Latvia's knowledge-intensive bioeconomy in the global market, based on sustainable solutions and the development of high-value-added products.

Management group

The management group was established in 2022, involving:

- 4 ministries (Ministry of Agriculture, Ministry of Economics, Ministry of Education and Science, Ministry of Smart Administration and Regional Development),
- 12 industry organizations,
- 5 research institutions.
- 15 meetings have been held to discuss the implementation of strategic priorities.

Knowledge-intensive bioeconomy strategy

- The renewed Knowledge-Intensive Bioeconomy Strategy (RIS3) for 2024–2027 was adopted on 16.09.2024.
- **Focus: Deep Biotechnology** (Bio DeepTech) processing of biomass and its side streams.
- Main directions:
  - Science-based development of new technologies for biomaterials and biochemicals.
  - Efficient use of resources, promoting a circular economy in the bioeconomy.
  - Strengthening international cooperation in research and innovation.

BIOECONOMY SHOWCASE

Produces Protein Isolate, Fiber (Extruded hulls, Soluble fiber), Native Starch, Starch Concentrate, Yeast, Feed Protein from peas and fava beans.

ASNS Ingredient

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Developing a new generation of sugars, high purity hydrolysis lignin, and unique microcrystalline cellulose from hardwood.

Fibenol

Birch plywood producer and a leader in sustainable forestry innovation. Strong R&D in wood-based materials and bio-refining technologies

Latvijas Finieris

Develops and manufactures herbal medicines and natural health products and combines pharmaceutical standards with bio-based formulations

Silvanols

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Some of the bioeconomy innovation ideas supported by LIAA

- **Vegan soil conditioner/fertilizer pellet prototype.** Made from 100% plant and organic waste raw materials. Designed for organic farming.
- **5 types of soft drinks prototypes with plant protein.** Technological processes for industrial production have been developed. Technical and economic feasibility study for market introduction has been carried out. Prototype of pest detection equipment.
- **Automated grain sample processing system.** Increased pest detection efficiency and accuracy
- **Prototype of tick feeding device.** Fully automated technology. Developed without animal testing.
- **5 new product prototypes (juices/teas).** Experiments with natural raw materials and seaweed. Added calcium supplement to functional drinks. Nutritional and manufacturing sterility analysis performed. Prototype of odor recorder.
- **Experimental digital device for capturing odor data.** Potential applications in the food and cosmetics industries.
- **Jelly honey candies and 4 types of syrups.** Unique recipes with natural ingredients have been developed. Nutritional value and safety of production processes have been analyzed.

Investment attraction services

(including foreign representative offices)

- In 2024, LIAA implemented 9 investment projects in the field of bioeconomy, which attracted investments of **EUR 286 million**.
- By 2025, 1 success story in the field of bioeconomy worth EUR 120 million can already be noted.
- Currently, LIAA is working on 14 active investment projects in the field of bioeconomy, with a total planned investment volume of over **EUR 1.9 billion (!)**, and a planned number of new jobs - **604**.
- LIAA has identified 36 contacts with transaction characteristics in the bioeconomy field (qualified leads).
- **Biorefining as a special potentia**l - work continues on the largest investment project in the bioeconomy in Latvia - **Fibenol**.
- LIAA currently has **46 “Green Corridor” projects worth EUR 2.95 billion**, which are planned to create 3,050 jobs. In 2025, 3 “green corridor” projects worth EUR 271 million with 121 jobs have been approved. The largest number of projects is in the fields of energy and smart mobility – 25, followed by **bioeconomy with 8 projects** and construction, transport, logistics with 7.


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Our mission – your achievements.
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www.investinlatvia.org
www.latvia.eu