Transfer of knowledge from science to business

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O'ZBEKISTON RESPUBLIKASI QISHLOQ XO'JALIGI VAZIRLIGI

Samarkand, April 27, 2022

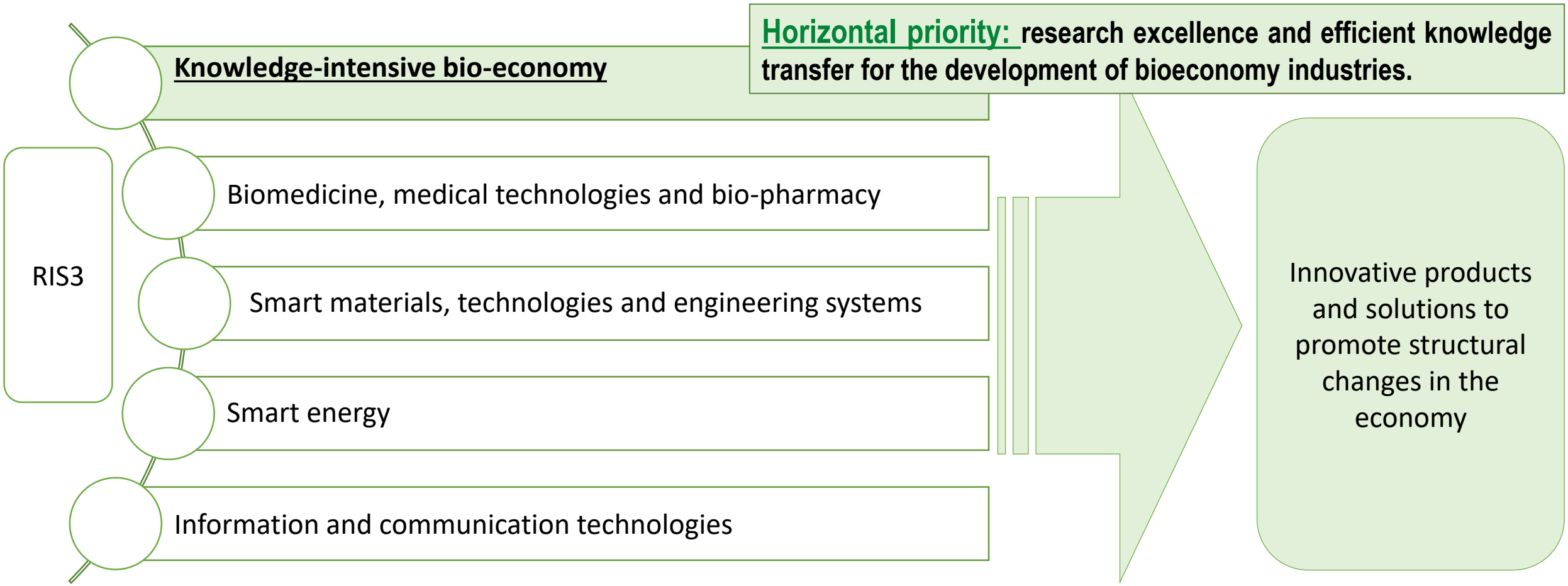
Contents of the presentation

1. Bioeconomics and knowledge
2. Transfer of knowledge
3. Success stories about the transfer of knowledge

«Knowledge is of no value,
unless you put it into practice»

/Anton Chekhov/

Smart Specialisation Strategy (RIS3)- integrated European Union- and national-level development



The Smart Specialisation Strategy of Latvia (RIS3) is a strategy of economic transformation towards higher added value, productivity and more efficient use of resources. The strategy of the transformation of the national economy is closely associated with the current economic development at national level and with competitive advantages (current and potential)

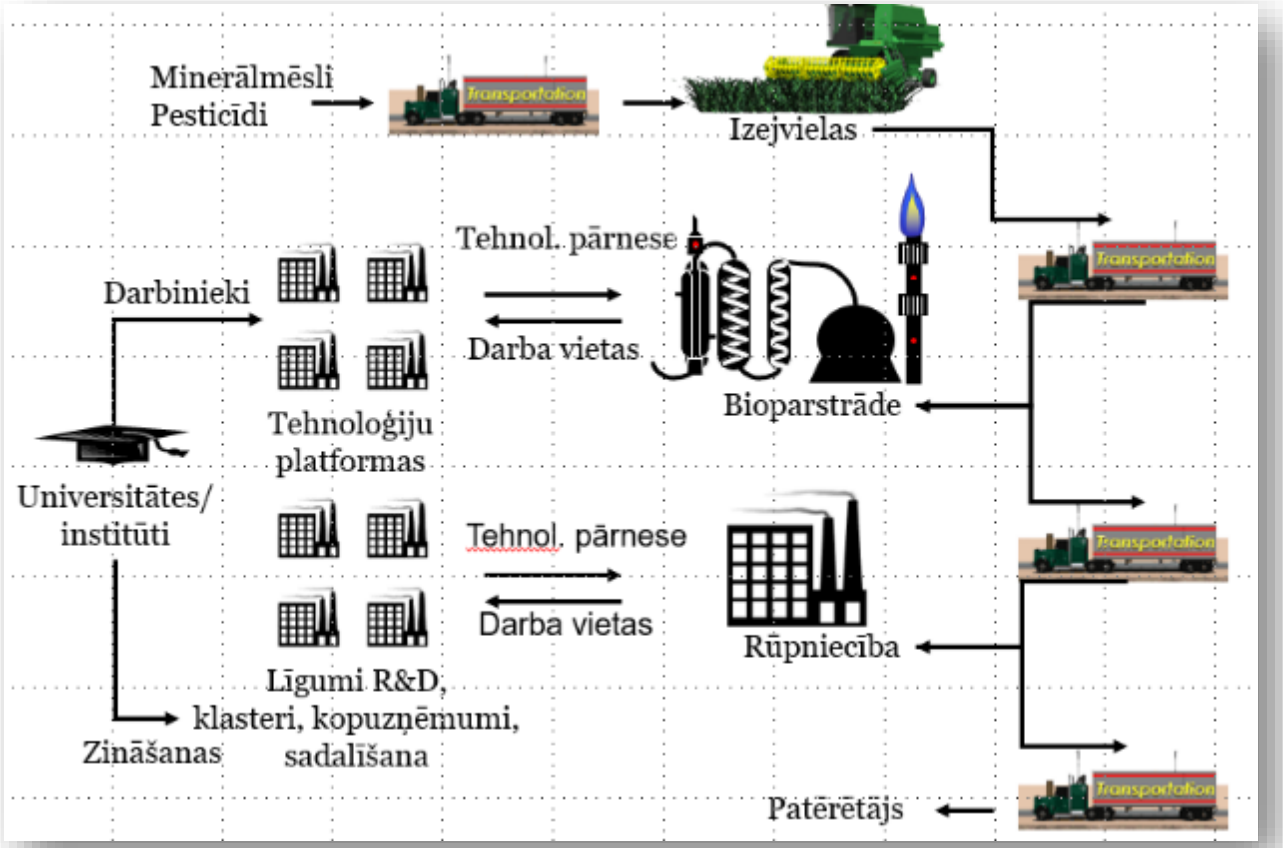
Knowledge-based value chains for a growing bioeconomy

Life sciences and biotechnology in convergence with other technologies:

- provide a knowledge base for the sustainable management, production and use of biological resources;
- provide new, safe, affordable and eco-efficient products;
- support competitiveness and the sustainability of major industries

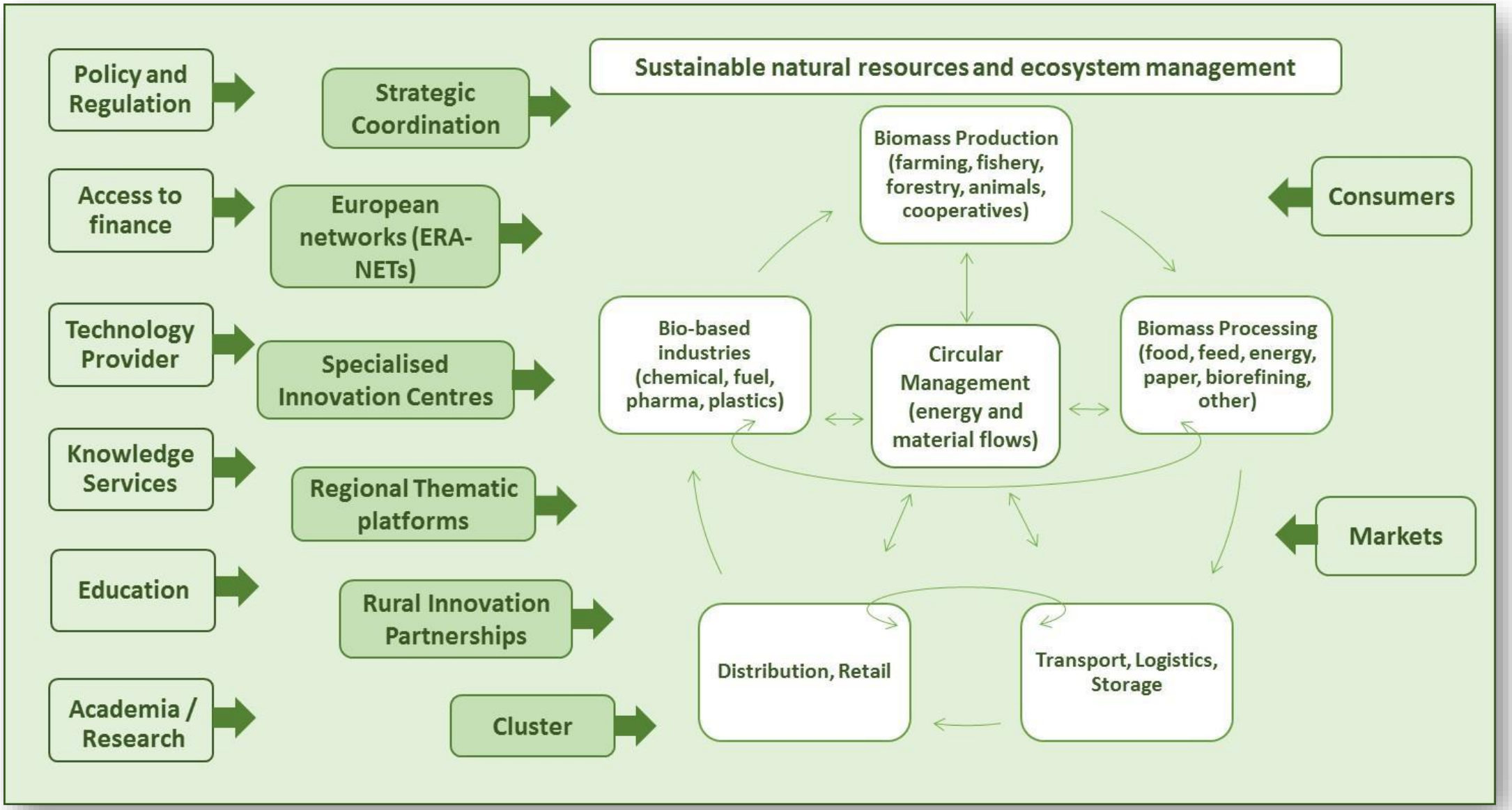
Development opportunities:

- Open data access, technological transformation of the services provided by national institutions;
- International competitive academic environment, cooperation among higher education establishments;
- Support to cross-sectoral projects;
- Facilitation of dialogue between scientists and entrepreneurs;
- Regional specialisation and connectivity.



OECD (2005). Supply and demand chain inhibitors in industrial biotechnology. DSTI/STP/BIO(2005)44.

Model of a regional bioeconomy ecosystem



EU Commission, Bioeconomy development in EU regions, 2017

Strengthening research and innovation

Product innovation: A good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user friendliness or other functional characteristics.

Process innovation: A new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.

Marketing innovation: A new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.

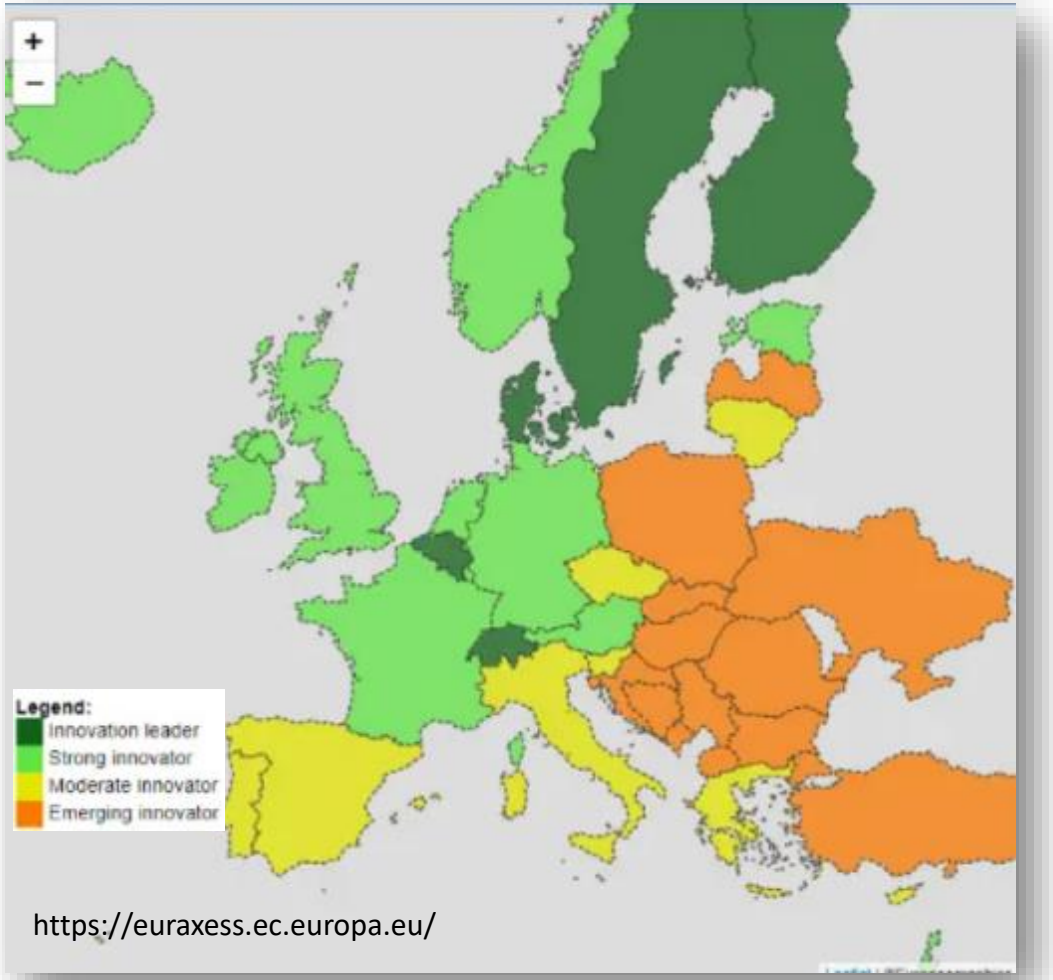
Organisational innovation: A new organisational method in business practices, workplace organisation or external relations.

https://www.oecd.org/site/innovationstrategy/defininginnovation.htm

«An innovation is an idea that has been transformed into practical reality»

/Dr. Makarand "Chips" Chipalkatti, Osram Slyvania/

European Innovation Scoreboard 2021



https://euraxess.ec.europa.eu/

Innovations – the cooperation project «Research on the Application of an Innovative Dehydration Technology in Sapropel Production and the Possibilities of Using Sapropel-based Products in Crop and Livestock Production»

PROCESS INNOVATION !!!

PRODUCT INNOVATION !!!

In the project, the following organisations **are involved:**

- **2 research institutions,**
- **4 business companies,**
- **3 NGOs**

Extraction and primary and secondary dehydration of sapropel

- Examination and analysis of various sapropel dehydration technologies;
- Impacts of the technologies applied and storage conditions on raw sapropel properties;
- Economic assessment of the technologies applied and the application of the best one for the commercialization of product.

Use of sapropel in organic farming

- Development of an efficient and sustainable fertilization system for organic farming with sapropel as a fertilizer in a 3-year crop rotation plan (wheat, potatoes and beans).

Use of sapropel products in horticulture

- Development of a new product - an alternative sapropel substrate;
- Applicability and efficiency of the newly developed product and improvements in substrates for seedlings planted in containers;
- Examination of the effect of the new product on plants in covered areas (green herbs and winter resistant plants).

Use of sapropel products in livestock farming

- Development of the form and dosage of an organic feed additive;
- Assessment of the effect of the newly developed product on the health status and immunity of dairy calves for fattening;
- Assessment of the effect of the newly developed product on the production performance of lambs for fattening.

A technology is transferred from another industry and applied in sapropel extraction, which is a complete innovation

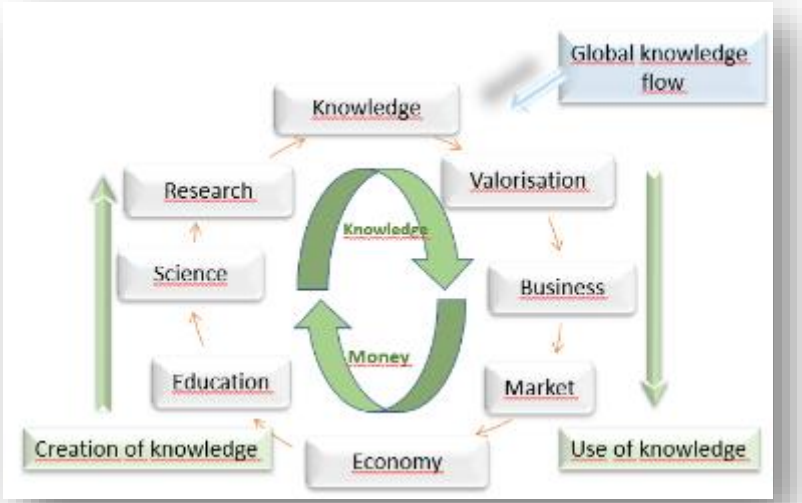
A significantly improved production method - an organic fertilization system – is developed

New, better and more competitive products for the horticultural and livestock industries are developed to deal with the challenges identified in the industries

«Knowledge shared is power multiplied»

/Robert Noyce, Intel Co-Founder/

Cooperation between science and businesses



Product
raspberries juice

Production process

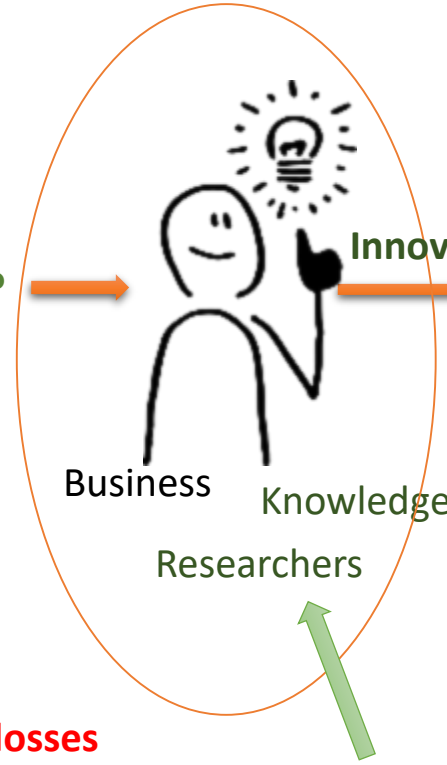
By-product
raspberries seeds

RAW MATERIAL ?

OR

WASTES ?

Disposal = economic losses



Innovation

Valorization of side streams

New innovative products

Economic benefit

Bioeconomy researched by institutions in Latvia

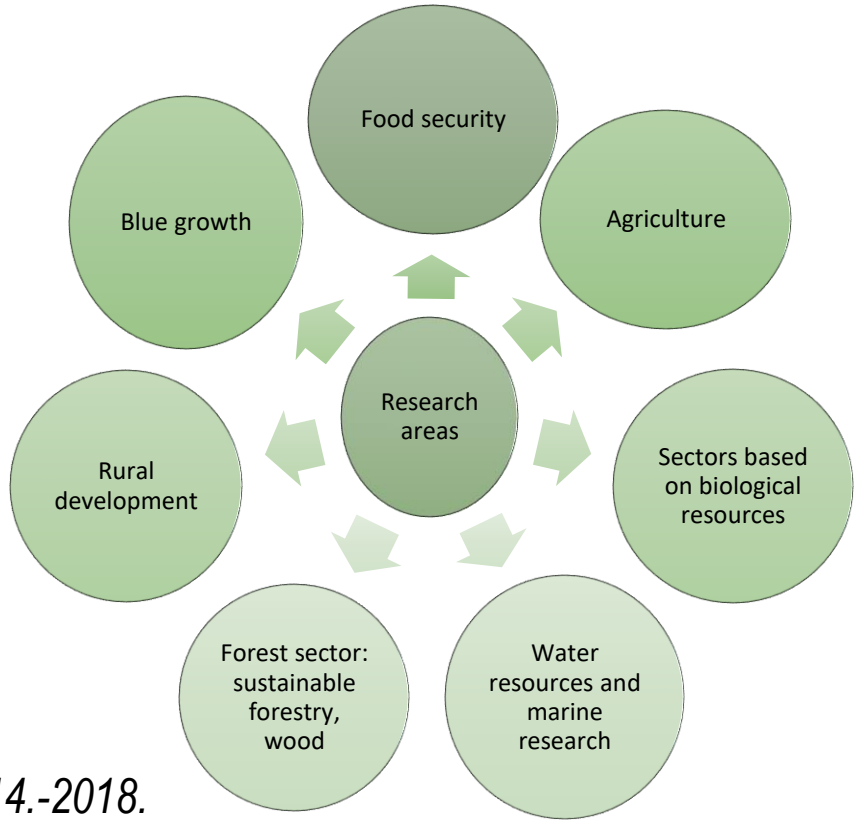
15 research institutions:

- ✓ Latvia University of Life Sciences and Technologies (LLU)
  - ✓ LLU Institute of Agricultural Resources and Economics (AREI)
  - ✓ LLU Institute of Horticulture (IH)
  - ✓ LLU Institute for Plant Protection Research (Agrihorts)
- ✓ University of Latvia (UL)
  - ✓ UL Institute of Microbiology and Biotechnology
  - ✓ UL Institute of Biology
- ✓ Riga Technical University (RTU)
  - ✓ RTU Institute of Energy Systems and Environment (IESE)
- ✓ Daugavpils University (DU)
  - ✓ DU Latvian Institute of Aquatic Ecology (LIAE)
- ✓ Latvian State Institute of Wood Chemistry (LSIWC)
- ✓ Institute of Food Safety Animal Health and Environment (BIOR)
- ✓ Latvian State Forest Research Institute «Silava»
- ✓ Baltic Studies Centre (BSC)

35% of the total scientific personnel in Latvia are engaged in fields associated with the bioeconomy.

Latvia University of Life Sciences and Technologies (LLU) is a leading Latvian research institution in the field of bioeconomy,

the widest range of topics (*Web of Sciences*, 2014 – 2018) is developed at Latvia University of Life Sciences and Technologies (LLU) that specializes in agriculture, food and forestry, rural development, renewable energy and biofuel research.



Source: Analytical review of the research ecosystem «Knowledge-based bioeconomy» 2014.-2018.

Bioeconomy Strategic Research Alliance in Latvia

Founded: 24/09/2014

Objectives:

- ✓ to enhance the competitiveness of bioeconomy sectors through research and innovation
- ✓ to contribute to the implementation of overall EU 2020 thematic objectives

Research and innovation capacity: ~ 400 doctors of science at: Latvia University of Life Sciences and Technologies (LLU) and 2 subordinate institutes (Horticulture and Agricultural Resources and Economics); 3 forest sector research institutes, Institute of Food Safety, Animal Health and Environment (BIOR).

koksnes ķīmijas institūts
institute of wood chemistry

SILAVA

INSTITUTE OF HORTICULTURE

BIOR
INSTITUTE OF FOOD SAFETY, ANIMAL HEALTH AND ENVIRONMENT

Latvian Food Bioeconomy Cluster

The Latvian Food Bioeconomy Cluster (LFBC) is a triple-helix cluster organization, one of the most developed and internationally active bioeconomy clusters in the Baltic countries.

The vision of the cluster is to become a key food bioeconomy innovation hub in Latvia.

The objectives of the cluster are:

- To promote the sustainable production, processing and consumption of healthy, high-quality and safe food.
- To develop knowledge-based food bioeconomy innovations.
- To promote scientific and industrial cooperation both locally and internationally.

The cluster fosters cooperation between its members and external partners, to promote knowledge and technology transfer, develop new products, technologies and innovative solutions, as well as to promote the modernization, competitiveness, growth of export and innovation capacity of the cluster members.

The members of the cluster are 9 innovative food industry companies, 5 universities and R&D institutions working in the field of bioeconomy and 1 public sector organization - Vidzeme Planning Region.

Cooperation patterns

Classical forms of cooperation

Buyers and sellers of raw materials, products

Membership in a producer or industry association or in a cooperative

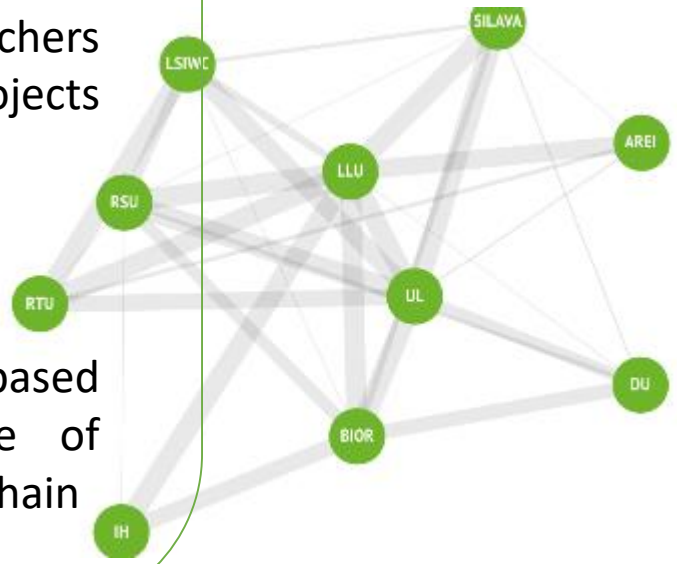
Forms of cooperation that promote the creation, sharing and use of knowledge

Entrepreneurs unite in clusters and share their knowledge and experience

Entrepreneurs cooperate with researchers and/or research institutions (joint projects or contract projects)

Companies hire young scientists

Business-to-business cooperation is based on the joint creation and/or use of technologies and/or a common value chain



«Knowing is not enough; we must apply. Willing is not enough; we must do»

/Johann Wolfgang von Goethe/

Business examples in the bioeconomy

Innovative dairy products

LACTOSE-FREE WHEY PROTEIN DRINK «PIENA SPĒKS» ENRICHED WITH VITAMIN D3

«Smiltenes piens» Ltd.

Valorise waste and by-products

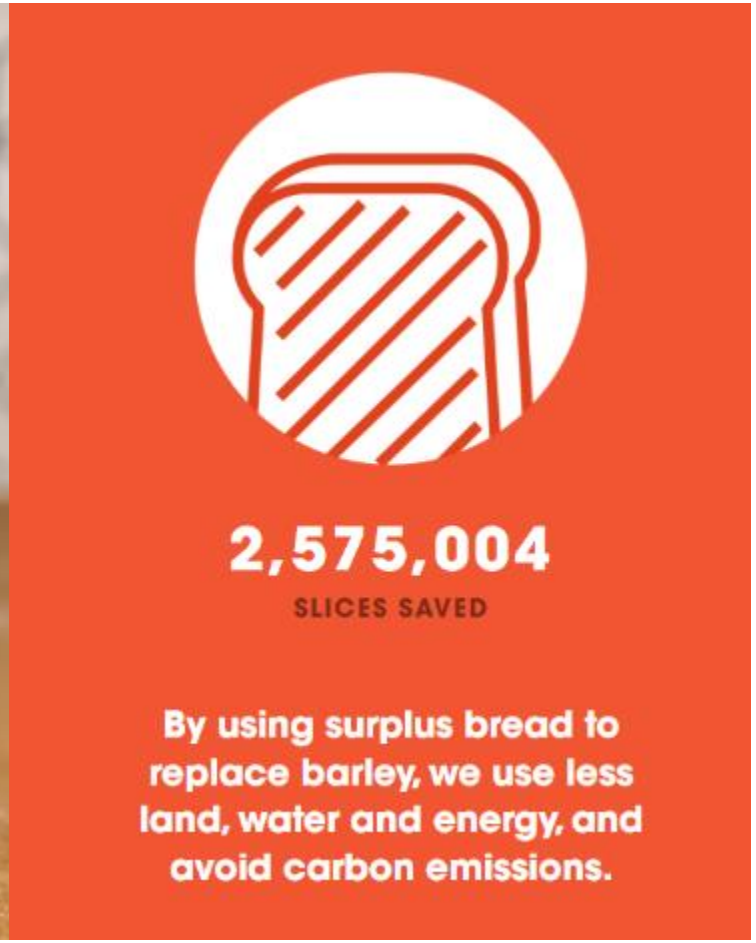
- ✓ Main raw material: milk
- ✓ By-product: whey

- ✓ Whey - the residue of milk processing, making up on average 50% of the total.
- ✓ Mostly used in livestock production or represent industrial waste.
- ✓ The company produces a milk whey protein-rich drink, «Piena spēks» (Milk Power), which contains three times more protein than regular milk.
- ✓ Protein concentrate and lactose solution are produced from the whey by filtration. Hydrolysis and condensation result in a syrup that is used in the food industry.

Business examples in the bioeconomy

Resource recovery and recycling

- ✓ Recover and reuse of resources or energy from discarded **waste or by-products**
- ✓ **Valorise** waste and by-products by **giving a second life** and by reusing them to make **a new product**
- ✓ E.g. Toast Ale – Bread waste to Beer



https://www.toastale.com/browse

Business examples in the bioeconomy

KARAVELA

Atlantijas 15, Riga, Latvia
www.karavela.lv

Innovative fish products

- ✓ KARAVELA Ltd. is one of the leading and largest producers of canned fish and preserves in Europe with 140 years of experience in the production of canned fish and other fish products.
- ✓ In 2020, Karavela posted its best-ever turnover of EUR 66 million (USD 77.3 million) and exported products to 46 countries.
- ✓ The main factors behind this success include the company's ability to make quick decisions and continuous investment in research and development.

INNOVATIVE
Vegan Tuna

https://www.karavela.lv/en/

Thank you for your attention!

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