GENB
YOUNG BIOVOICES
FOR A SUSTAINABLE
FUTURE

Capacity building webinars

Introduction: GenB and your role as a GenB ambassador

Katharina Handler, Juliet Tschank (ZSI)

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WHAT DOES GENB DO?

Co-creating innovative approaches to teach and learn the bioeconomy

Inspiring, influencing and informing young people about sustainable lifestyles

Educating young people on the bioeconomy opportunities

Training teachers and others educators in teaching enviromental issues

Engaging and empowering GenB Bioeconomy Ambassadors

Supporting GenB Ambassadors to take an active role and drive the transition transition towards a sustainable bioeconomy

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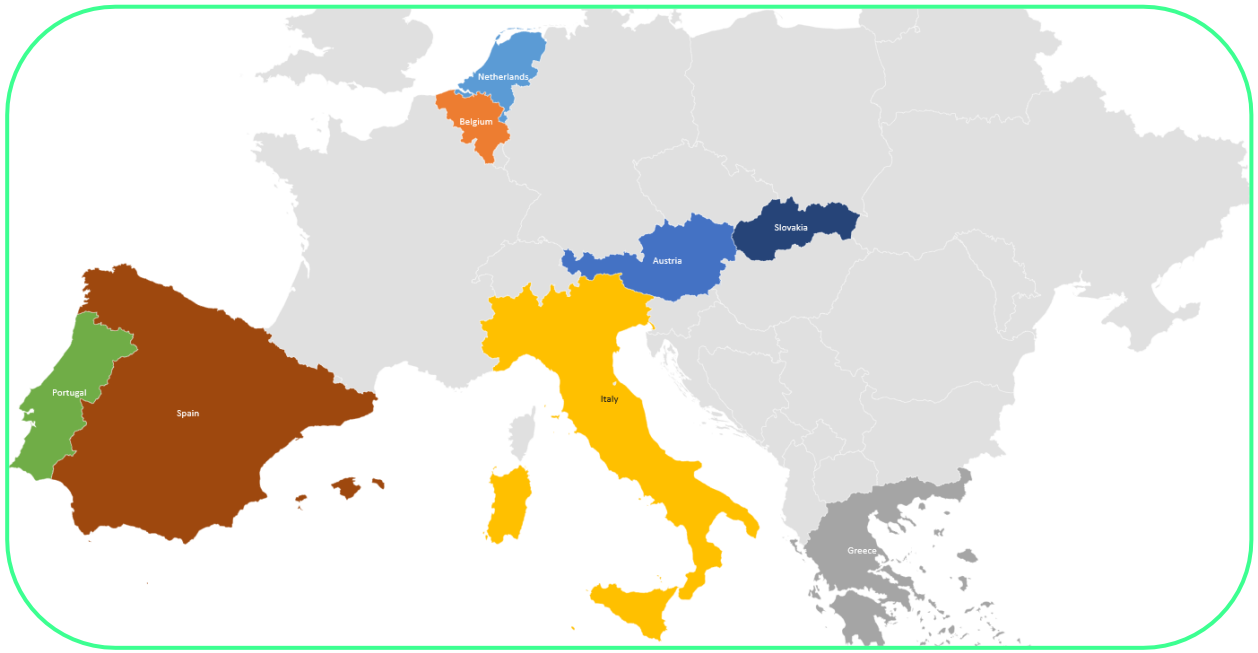
GenB Countries and partners



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The Netherlands	John Vos	BTG	vos@btgworld.com

APPLY NOW AND BECOME A GENB AMBASSADOR

Scan the QR Code

WHO IS A GENB AMBASSADOR?

GenB Ambasadors GenB Ambasadors are a **new generation of change-makers** passionate about sustainable development and **committed to raising awareness and informing communities about the role of the bioeconomy and related fields** to tackle the pressing environmental issues of our time.

APPLY NOW AND BECOME A GENB AMBASSADOR

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WHAT WILL YOU GET AS A GENB AMBASSADOR?

GenB ambassadors will be required to dedicate a maximum of a few hours each month to project activities.

Visibility and reward: GenB Ambassadors will be the frontrunners in promoting the bioeconomy among young people. Their role will be rewarded through many visibility actions, including social media, participation to conferences as young biovoices, engagement in communication activities at European scale.

Networking Opportunities: GenB Ambassadors will have the chance to connect with a global community of like-minded individuals, industry leaders, and organisations committed to driving positive change in the bioeconomy sphere.

Skill Development: GenB Ambassadors will have access to a comprehensive training program designed to enhance their understanding of the bioeconomy and its potential, as well as equip them with key skills and tools to promote the bioeconomy. They will gain valuable knowledge and expertise in various aspects of the bioeconomy, including biotechnology, renewable resources, circular economy principles, and sustainable entrepreneurship. GenB Ambassadors will be also equipped with soft and transversal skills, such as design-thinking, visual thinking, pitching, and public speaking, to make their voice heard on the bioeconomy.(coming soon)

GenB Ambassadors will also be provided with **toolkits** including several formats, tools, resources and educational material, developed in the context of several EU funded projects to further promote bioeconomy (coming soon).

GenB eco-gadgets: GenB Ambassadors will be provided with GenB eco-gadgets for their participation in events.

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GenB Ambassadors taking a role

Effective communication: e-mail is not very functional. How can we manage? WA community? Telegram channel?

Social media campaign with GenB Ambassadors:

- Reels to present yourself as GenB ambassador. You are still in time to send your video presenting yourself for the campaign. Contact communication@fvaweb.it
- Video "What's bioeconomy". Short video in English with the GenB Ambassadors saying a sentence each. You will receive an e-mail with all the text and instructions (by your country responsible) to send your contributions recorded with your cell phones.

Events in the countries:

- The incoming events where you could be involved will be notified by your country responsible (ad APRE for the international ambassadors).

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Thank you !

Katharina Handler & Juliet Tschank

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GenB: Capacity Building Seminars Basic level 1

MODULE 1 - Introduction to the Bioeconomy

John Vos, Marisa Groenestege
BTG Biomass Technology Group B.V.

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Index

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What does bio-based mean?
What does biomass mean?

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What does bio-based mean?

Bio-based:

A product that is completely or partially based on biomass.

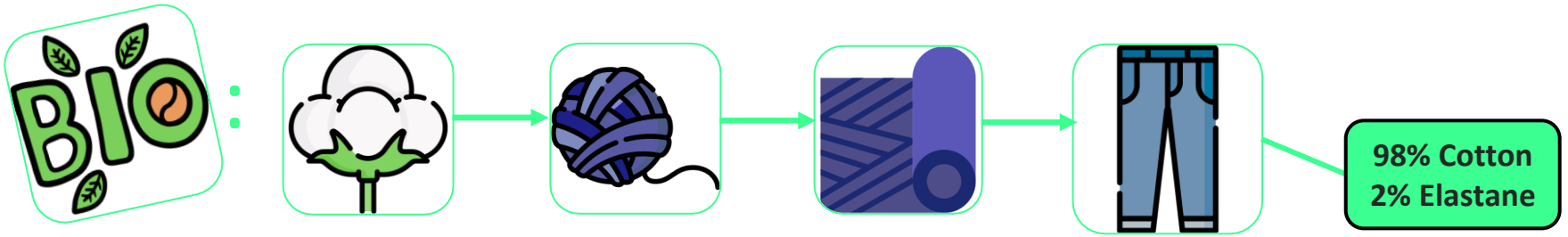
Biomass:

Material out of biological renewable sources, like wood, plants, algae, vegetables, and food waste.

- *A bio-based product does not have to be a finished product! It can be a material, intermediate product, semi-finished product or end product you find in the store.*
- *It does not have to consist of 100% biomass; even at a lower percentage we call it bio-based.*

Bioeconomy:

Encompassess all sectors and associated services and investments, that produce, use, process, distribute or consume biological resources, including ecosystem services.



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What does bio-based mean?

European Bioeconomy Strategy

Enables a green and just transition and covers all three dimensions of sustainability: environment, society and economy.

Support a sustainable bioeconomy!

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What is biomass?

Biomass is the basis of the bioeconomy!

- It encompasses renewable material, coming from primary production sectors (agriculture, forestry, fishery).
- Next to this, residues, such as food waste and residues from industries are also used in the bioeconomy.
- It is important to know how much biomass is available, so that we don't take too much and nature cannot recover.

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What is biomass?

Some products, wastes and residues used in the bioeconomy

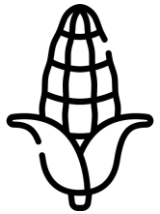
Typically:

Wood

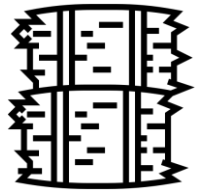
Oil crops

Sugar crops

Starch crops



Agricultural residues



Industrial, municipal and household waste

But also:

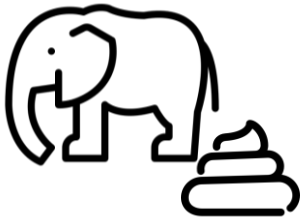
Seaweed & Algae

Coffee grounds

Milk protein

Mushroom roots

Elephant poo



Insects

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Linear & Circular Bioeconomy

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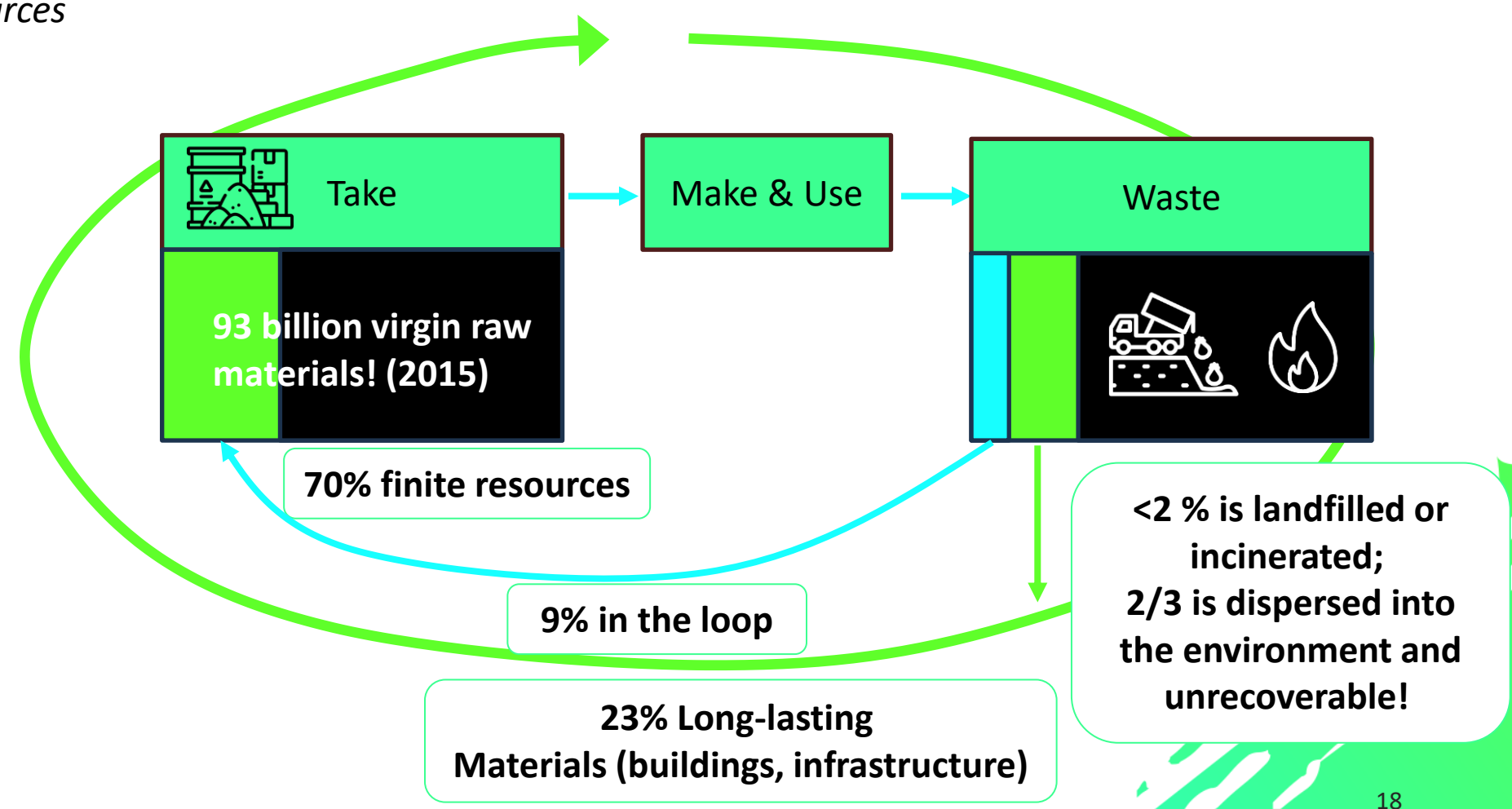
Linear economy

Linear economy is the economic system in which people buy a product, use it, and then throw it away.

Problems:

- *Depletion of natural resources*
- *Environmental pollution*
- *Climate change*
- *Damage to ecosystems & biodiversity*
- *Economic disadvantages*

Go circular!



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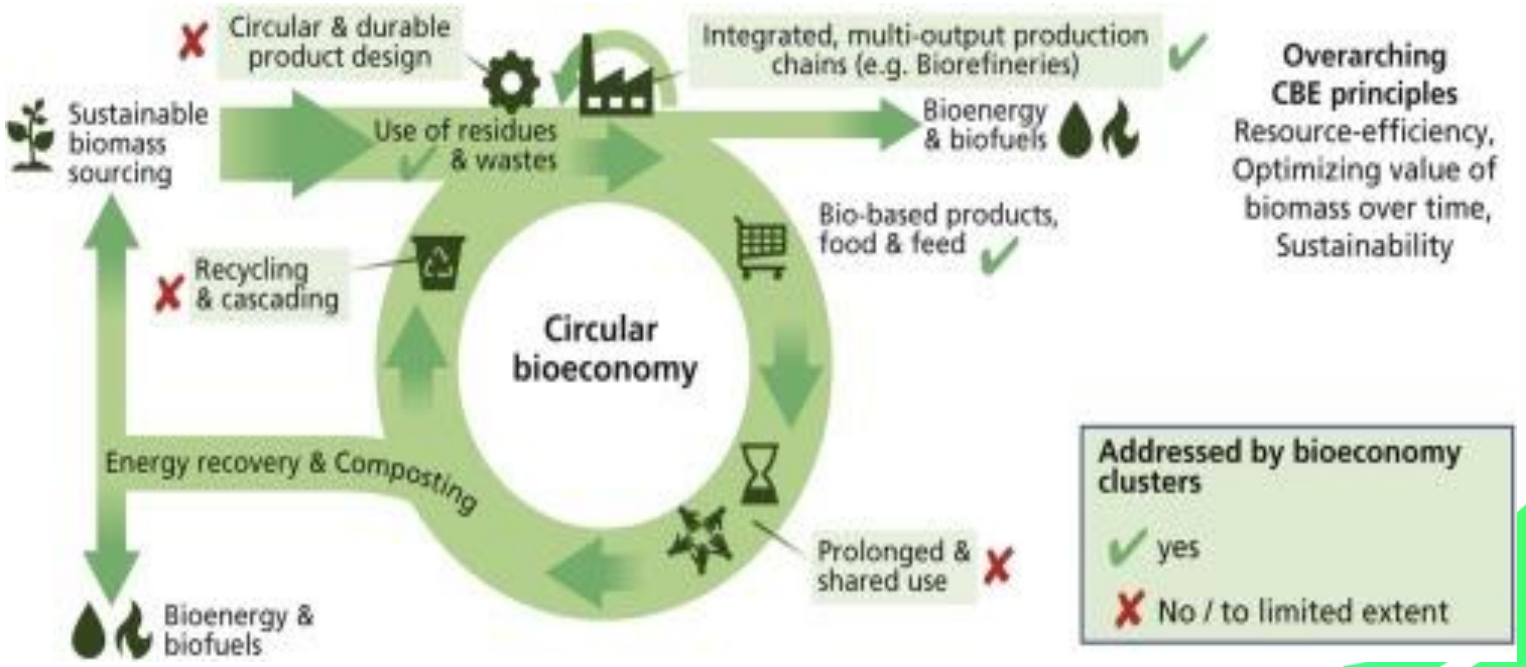
Source: (Circle Economy, cited in National Geographic, 2020)

Circular bioeconomy

In a **circular economy**, waste is minimized, natural resources are conserved, pollution is reduced, and raw materials are used to produce products and services of the highest possible value.

- Raw materials (including biomass and residue streams) are used to produce products and services of the highest possible value.
- All material streams are used to produce different products:
  - Bioenergy & fuels
  - Bio-based products
  - Food & feed
  - Compost -> Agriculture
  - Capture & use of CO_2



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Bioeconomy sectors, jobs & links to the SDGs

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Working in the bioeconomy

Not just producing bio-based products!

Wide range of sectors →

Range of activities:

- Tourism
- Cultural activities
- Trade
- Manufacturing
- Construction
- Marketing
- Scientific activities
- Water treatment
- And many other activities and services!

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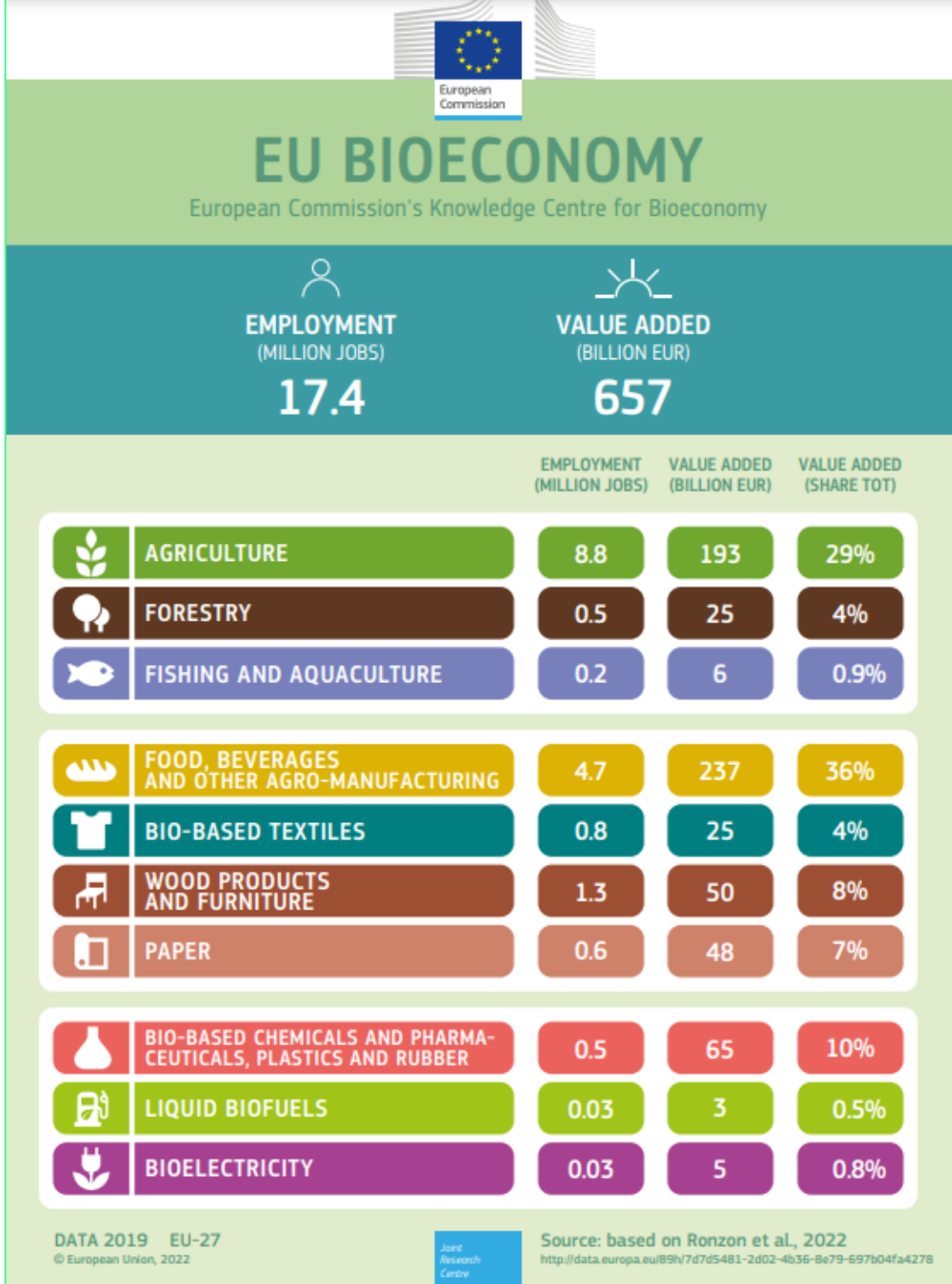

Bioeconomy Job Sectors – links to SDGs

Agriculture – 1, 2, 3, 6, 8, 11, 12, 13, 15

Forestry – 12,13,15

Fishing and Aquaculture – 12, 13, 14

Food/beverages – 1, 2, 3, 6, 12, 13, 14, 15

Bio-based Textiles – 8, 9, 12

Wood products and Furniture – 8, 9, 12

Paper – 8, 9, 12

Bio-based Chemicals and Pharmaceuticals – 3, 8, 9, 12

Plastics and Rubber – 8, 9, 12

Liquid Biofuels and Bioelectricity – 7, 8, 9, 11, 12

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Want to know more?

Bioeconomy Strategy and Size

- European Commission (2018), *A sustainable Bioeconomy for Europe: strengthening the connection between economy, society and the environment*. ***Updated Bioeconomy Strategy***. Directorate-General for Research and Innovation, available at: https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/
- European Commission (2022), ***EU Bioeconomy Strategy Progress Report.*** *European Bioeconomy policy: stocktaking and future developments*. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022DC0283#:~:text=The%20Bioeconomy%20Strategy%2C%20with%20its,%2C%20economic%2C%20and%20social%20sustainability.&text=industries%20are%20increasing%20and%20show,bio%2Dbased%20chemicals%20and%20materials.
- Infographic ***Bioeconomy employment and value added: 2019 data***. Source: https://knowledge4policy.ec.europa.eu/publication/bioeconomy-employment-value-added-2019-data-infographic_en
- Mubareka, S., Giuntoli, J., Sanchez Lopez, J., Lasarte Lopez, J., M`barek, R., Ronzon, T., Renner, A. and Avraamides, M., ***Trends in the EU bioeconomy***, EUR 31434 EN, Publications Office of the European Union, Luxembourg, 2023, ISBN 978-92-68-00295-7, doi:10.2760/835046, JRC132639. https://publications.jrc.ec.europa.eu/repository/handle/JRC132639
- ***The bioeconomy: a brief introduction***. Factsheet prepared by the AllThings.Bio project. Weblink: https://www.allthings.bio/wp-content/uploads/2022/06/ATB_factsheet_bioeconomy_FINAL.pdf

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Linear and Circular Economy

A circular economy is a systemic approach to economic development designed to benefit businesses, society, and the environment. In contrast to the 'take-make-waste' linear model, a circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources.

- National Geographic article "***Is a world without trash possible?*** Story that appeared in the March 2020 issue of National Geographic magazine. Weblink: link https://www.nationalgeographic.com/magazine/2020/03/how-a-circular-economy-could-save-the-world-feature/
- Diagram in this article: ***AN X-RAY OF THE GLOBAL ECONOMY.*** Every year we transform more than 100 billion tons of raw material into products. Less than a quarter becomes buildings, cars, or other long-lasting things. Less than 10 percent cycles back into the economy. Weblink: https://www.nationalgeographic.com/magazine/2020/03/how-a-circular-economy-could-save-the-world-feature/
- Ellen MacArthur Foundation, ***The circular economy in detail.*** Webpage that Includes the butterfly diagram that illustrates how technological and biological nutrient-based products and materials cycle through the system in the circular economy. Weblink: https://www.ellenmacarthurfoundation.org/the-circular-economy-in-detail-deep-dive
- Ellen MacArthur Foundation, ***Towards the circular economy Vol. 1***: an economic and business rationale for an accelerated transition (2013). Weblink: https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf
- ***The circular bioeconomy: Its elements and role in European bioeconomy clusters.*** Includes an illustration explaining the elements of the circular bioeconomy. Source: https://www.mdpi.com/2071-1050/13/1/413
- ***Development of the Circular Bioeconomy: Drivers and Indicators***. Includes an illustration showing the relations between bioeconomy, bio-based economy, green economy, and circular economy. Source: https://www.mdpi.com/2071-1050/13/1/413

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Videos on Bioeconomy and Circular Economy

Bioeconomy uses renewable biological resources from land and sea – such as crops, forests, fish, animals, and micro-organisms – to produce food, materials and energy. The Bioeconomy is heralded as the future economy for a zero-carbon world but many people struggle to define what is meant by the term 'Bioeconomy'.

- The video ***A new bioeconomy for a sustainable Europe*** informs about the action plan of the European Commission to develop a sustainable and circular bioeconomy that serves Europe's society, environment, and economy. Available here: https://www.youtube.com/watch?v=RfRN_hHeIKk
- The video ***The Bioeconomy starts here!*** explains briefly some basics of a bioeconomy by means of an animated film. It presents the differences between fossil and biological resources as basis for products. It introduces the bioeconomy as a circular economy and illustrates its positive aspects and advantages in the future. Available here: https://www.youtube.com/watch?v=2xvXkOMRTs4
- The educational video ***What is the Bioeconomy? Animation from THYME introducing key concepts, careers and sustainability,*** created by the THYME Project, sets out key concepts from initial definitions, through production of raw materials and products/services, and the need for society to move over to a circular economy model. Available here: https://www.youtube.com/watch?v=hx-jZmE-2_U
- Short video by the Ellen MacArthur Foundation, ***Rethinking Progress: The Circular Economy***. This is a very good video that explains a linear economy, the problems of a linear economy, a circular economy, what inspires the circular economy concept, what the circular business models are like and how they could be implemented in real world. Available here: https://www.youtube.com/watch?v=zCRKvDyyHml
- In this whiteboard animation video ***Circular Economy: definition & examples***, Alexandre Magnin explains what we mean by circular economy, goes through all the things we can do to go from our current economy to a circular economy and uses many examples. Available here: https://www.youtube.com/watch?v=X6HDcubgxRk

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UN Sustainable Development Goals

- The Founder Institute (2019). *Founder Institute*. https://fi.co/insight/17-companies-helping-meet-the-17-un-sustainable-development-goals
- United Nations (UN) video about Sustainable Development, SDGs, and strategies, methods and advances related to the same. Video serves to educate people and inform them about sustainable development, why sustainable development is necessary, and reasons and advantages of setting SDGs. Weblink: https://www.youtube.com/watch?v=3WODX8fyRHA

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Thank you !

John Vos & Marisa Groenestege

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GenB: Capacity Building Seminars Basic level 1

MODULE 2 – Applications of the Bioeconomy

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Bio-based products have existed for ages!

But an increasing number of innovative bio-based products are at (or are coming to) the market!

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Source: H. Bos, Wageningen UR, 2014

Biomass feedstocks

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Biomass feedstocks

- Biomass grown for this purpose, e.g. oil crops

- Residues:
  - Primary: on the fields (e.g. leaves, branches, straw…)
  - Secondary: at the factory (e.g. pomace, waste dough, spent grains…)
  - Tertiary: households, stores…. (e.g. food waste, unsold bread..)

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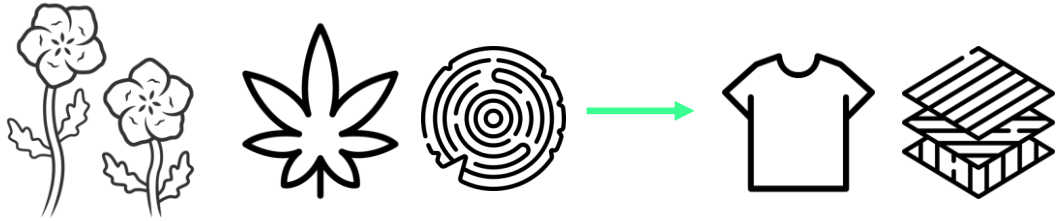
Biomass feedstocks

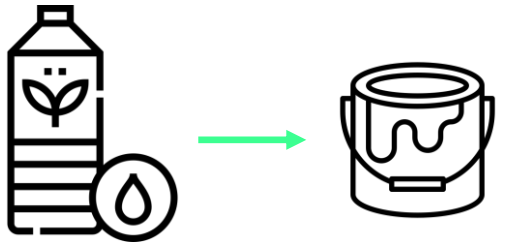
Examples of major feedstock types:

- **Fibres** (e.g. from flax, hemp, jute, and wood), used in textiles and composites



- **Starch** (e.g. from potatoes, corn and wheat), used in a wide variety of chemicals (including plastics, adhesives, additives, fuels and PLA)

- **Vegetable oils and fats** (e.g. from rapeseed, sunflowers, soya, palm oil, algae), used in paint, ink, linoleum



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Biorefinery & Biotechnology

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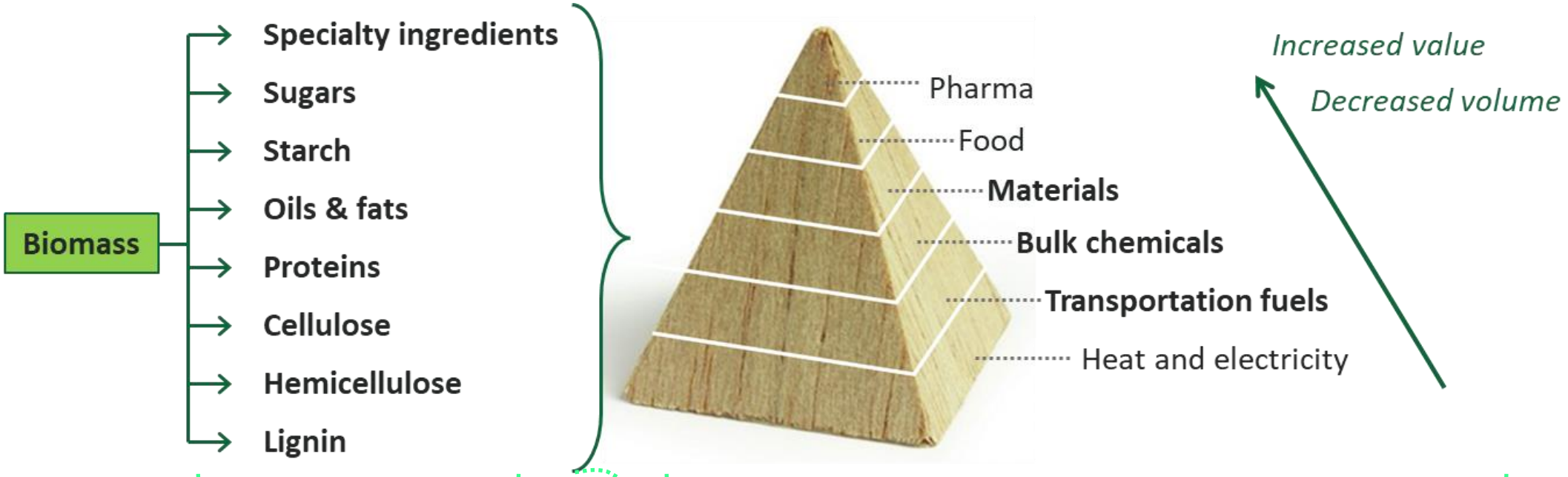
Biorefinery concept

A concept in which biomass feedstocks are converted into multiple bio-based products:



Intermediate products & processes

Outputs

Conversion technologies, e.g.: Biotechnological, biochemical, thermochemical…

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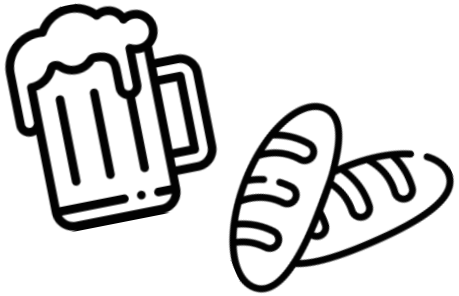
Biotechnology

Technology that involves living organisms!

Used in agriculture, food science, medicine…
Make useful chemicals and products

For example, without biotechnology there would be no beer or bread!

- Fermentation reaction in yeast.
- Carbon dioxide in yeast to make the bread rise.



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Where can we find these bio-based products?

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Applications

At your own home!

Plant pot from miscanthus

Table from mushrooms

Paint from sunflowers

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Source: Ralston, Popular Science, Vibers

Applications

Personal care products

Skin serum from grapes

Soap from citrus peels

Scrub from coffee grounds

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Source: EcoMondo, Cocokind, Goodfaith

Applications

Textiles & Fashion

Fabric from wood

Leather from pineapples

Jacket from beans & nuts

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Source: Lenzing, Pinatex, Spring home textile

Applications

Sports & outdoors

Bike from wood

Tennis racket from flax

Water bottle from sugar cane

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Source: Flipkart, Inhabitat, ReTulp

Applications

Packaging

Egg box from potato starch & cellulose fibres

Make-up tins from wood chips

Coffee cup from coffee grounds

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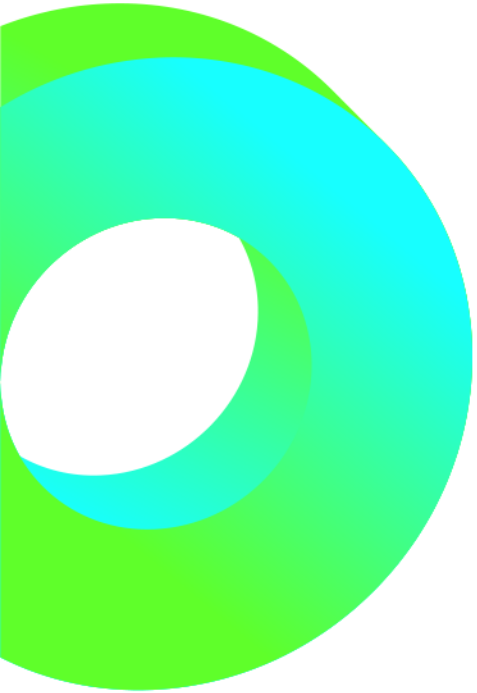
Source: Kipster, Stora Enso, Kaffeeform

Want to know more?

Biorefineries



- Francesco Cherubini, ***The biorefinery concept: Using biomass instead of oil for producing energy and chemicals***. *In:* Energy Conversion and Management, Volume 51, Issue 7, July 2010, Pages 1412-1421, https://doi.org/10.1016/j.enconman.2010.01.015

- International Energy Agency - Bioenergy Task 42. ***Bio-based Chemicals: Value Added Products from Biorefineries***. https://www.ieabioenergy.com/wp-content/uploads/2013/10/Task-42-Biobased-Chemicals-value-added-products-from-biorefineries.pdf

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Want to know more?

Bio-based product examples catalogues

- 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. URL: https://www.bioeconomy-library.eu/wp-content/uploads/2019/10/af_bioartgallery_27052019_crv_1015125439.pdf
- 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. URL: https://www.youtube.com/watch?v=6f7Ej2_BLso&list=PLtcmfwGu2PB3NdW5cwMb2ciiOdfyVtvvL
- 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. URL; https://bloom-bioeconomy.eu/wp-content/uploads/2020/10/Bioeconomy-suitcase-leaflet.pdf
- BioStep, ***Bioeconomy in everyday life***, https://www.bioeconomy-library.eu/wp-content/uploads/2019/11/2016_Biostep_Bioeconomy_Glasgow_Scotland.pdf
- The BBI JU brochure "***Bio-based industries made for European citizens***" presents showcases of bio-based products in our everyday life, including new and innovative solutions for renewable raw materials and waste – clothes made of milk waste, cups made of used coffee waste, rackets made of flax fibres, dandelion sap turned into tyres… URL: https://www.allthings.bio/bio-based-industries-made-for-european-citizens/

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Thank you !

Marisa Groenestege & John Vos

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Capacity Building Webinars: Basic Level 1

Module 3 - Skills needed and jobs in bioeconomy fields

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01

The EU bioeconomy market & employment opportunities

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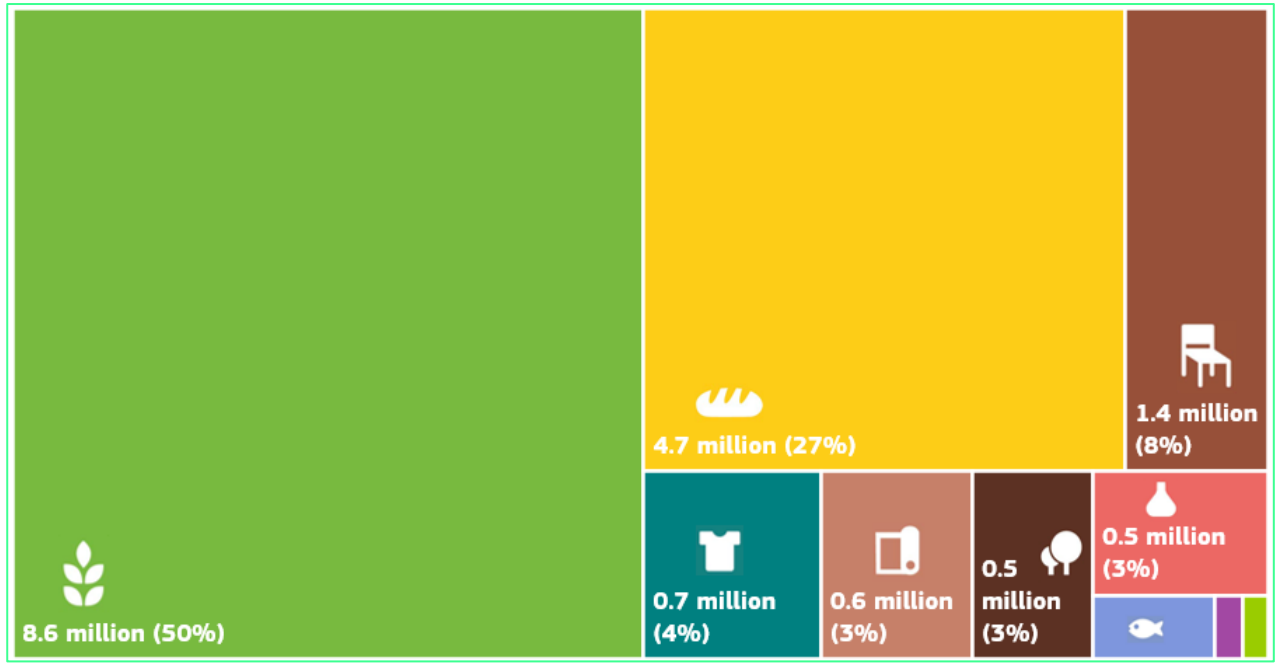
The EU Bioeconomy market at a glance



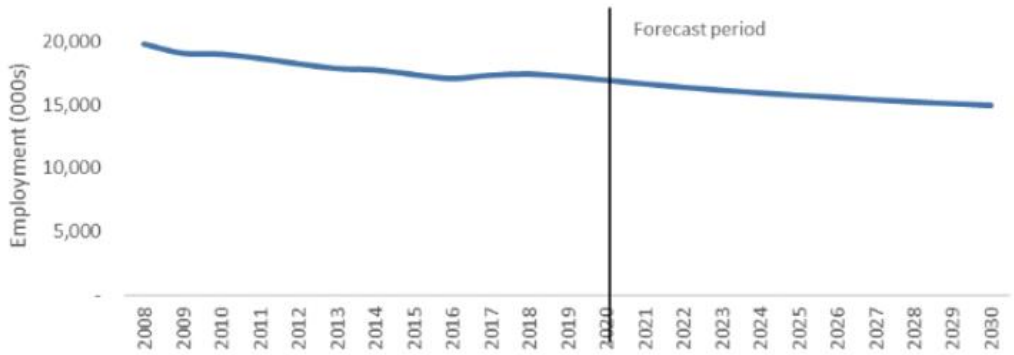
Bioeconomy market (2021)

- 728 billion EUR value-added
  - 5.0% of EU GDP
- 17.2 million jobs
  - 8.2% of EU employment
- 2/3 of bioeconomy in agri-food
- Bioeconomy employment ranges from 5 – 15% in most EU countries

Source: Lasarte-López, J. and M'barek, R., Brief on jobs and growth in the EU bioeconomy 2012-2021, Borzacchiello, M. T., editor, European Commission, 2024, JRC137187.

2030 trends in bioeconomy skills and employment

Figure 6 - Employment demand in the bioeconomy – projection to 2030.



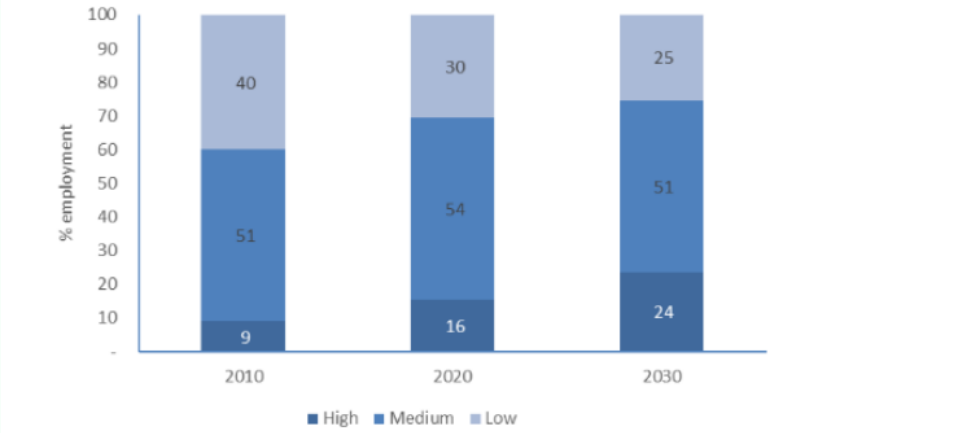
Source: CEDEFOP skills forecast; own estimates

Bioeconomy employment is expected to decline by 2030, mostly in agriculture.

Increase is expected in bio-electricity, bio-fuels, bio-based pharmaceuticals and bio-based rubber & plastics!

The demand-for highly skilled professionals will increase over the next decade!

Figure 9 - Employment by qualification level in the bioeconomy – projection to 2030.



Source: CEDEFOP skills forecast; own calculations

Source: European Commission, Directorate-General for Research and Innovation, Graaf, I., Papadimitriou, A., Peijl, S. et al., *Promoting education, training & skills in the bioeconomy – Final report*, Publications Office of the European Union, 2022, **https://data.europa.eu/doi/10.2777/367**

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Skills and education in the core of the EU Bioeconomy Strategy!

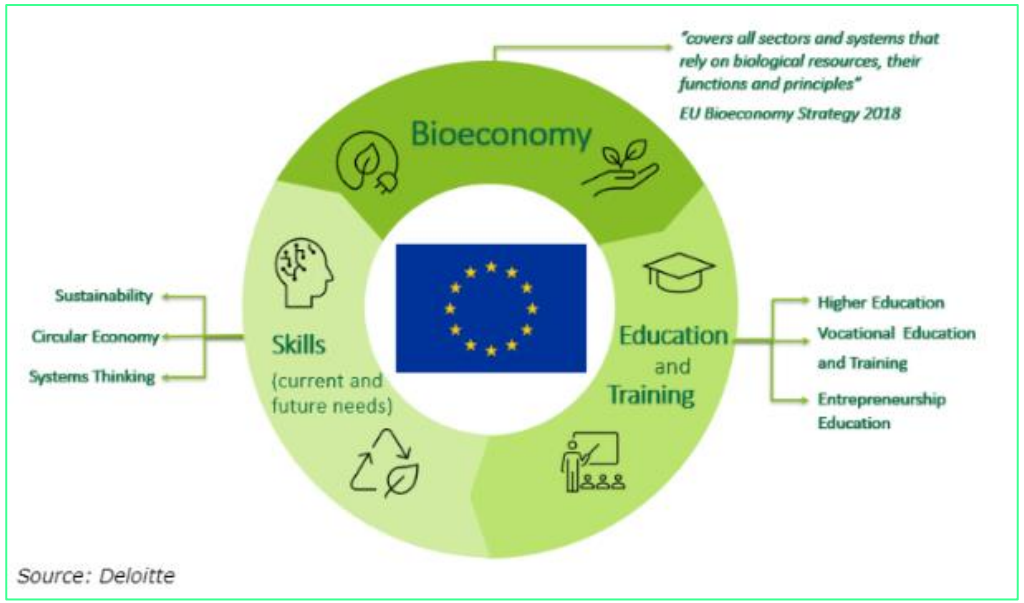
The European workforce needs to be re-skilled to "be able to work in bio-based value chains" as a means to strengthen the EU bioeconomy strategy and the Green Deal (Bioeconomy Progress Report, 2022)

3 core principles for bioeconomy skills:

- Sustainability
- Circular Economy
- Systems thinking

Bioeconomy education and training:

- Higher Education
- Vocational Education and Training (VET)
- Entrepreneurial Education



Source: European Commission, Directorate-General for Research and Innovation, Graaf, I., Papadimitriou, A., Peijl, S. et al., *Promoting education, training & skills in the bioeconomy – Final report*, Publications Office of the European Union, 2022, https://data.europa.eu/doi/10.2777/367

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02

Importance of information on bioeconomy careers

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Why is it important to document Bioeconomy career pathways?

Source: Adapted from BioGov.net D2.2 "Description of Job Profiles related to bioeconomy"

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Bioeconomy Job Profiles

Definition:

- A job profile is a short description that summarises expectations, responsibilities, tasks, and requirements of a particular job.

An essential tool for bioeconomy employment:

Practical guide for young students and professionals
Talent recruitment by companies
Standardisation of job requirements (industry)
Guide for design of vocational training and educational programmes
Key insight for regional / national policies

Comprehensive studies on bioeconomy job profiles/career pathways are generally missing!

BioGov.net (Horizon Europe project) analysis on bioeconomy job profiles is a good starting point to explore bioeconomy careers!

BioGov.net job profile © BioGov.net, 2023

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03

Jobs & Skills driving the future of bioeconomy

Results of the BioGov.net study

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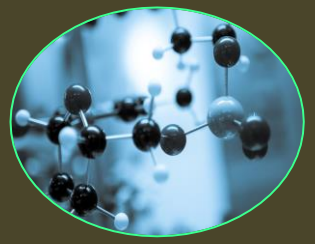
40 job profiles analysed and categorised



Research & Development

- Specialist in research and development in printing production
- R&D Specialist in wood processing
- Regional and Rural Development specialist
- Researcher on sustainability assessment
- Researcher on biomass exploitation
- Head of Education & Research on Sustainability/Circular Economy
- Expert or researcher in Bioenergy/Bioeconomy

Engineering & Processing

- Environmental Engineer
- Sustainability Engineer
- Bio-based Process Engineer
- Biotransformation Plant Operator
- Waste Management Specialist
- Biorefinery Manager
- Biorefinery Technician
- Bio-based Process Operator

Primary Production

- Biomass Producer & Mixed Farmer
- Social Farmer
- Specialist for precision agriculture
- Agricultural Scientist Landscape Ecologist (geoecologist)
- Adaptive Forestry manager (AFM)

Life Sciences

- Biostatistician
- Pharmacologist
- Microbiologist
- Bioinformatician
- Laboratory technician
- Biotechnologist

Consulting & Advisory

- Advisor on social Agriculture
- Farming Advisor
- Bio-based Business & Production Consultant
- Consultant for Green Tech - Resource Efficiency, Bioeconomy
- Prefab Building Production worker
- Risk Assessor Life cycle assessor

Arts & Humanities

- Bioeconomy Science Communicator
- Bioeconomy Multi-stakeholder Dialogue Facilitator
- Social Innovation and Social Impact Manager
- ESG expert
- Biobased products Artist & Fashion Designer
- Sustainable architect and designer

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Example #1 – Bioeconomy Science Communicator

Category: Arts & Humanities

EQF Level 7

Scope / Description of the job

- Awareness-raising on bioeconomy, bio-based products
- Promote knowledge and education on bioeconomy
- Community building and events / workshops
- General and specific communication (e.g business models)

Educational background

- Professionals **with non-technical education** (communication, business, finance, etc.) and **additional training on bio-based / circular economy** or similar.
- Reversely, **technical education** (e.g. Biotechnology) and **additional training in communication, marketing, business, etc.**

Essential skills

- Problem solving
- Critical Thinking
- Information search
- Collaboration
- Systemic knowledge about the bioeconomy

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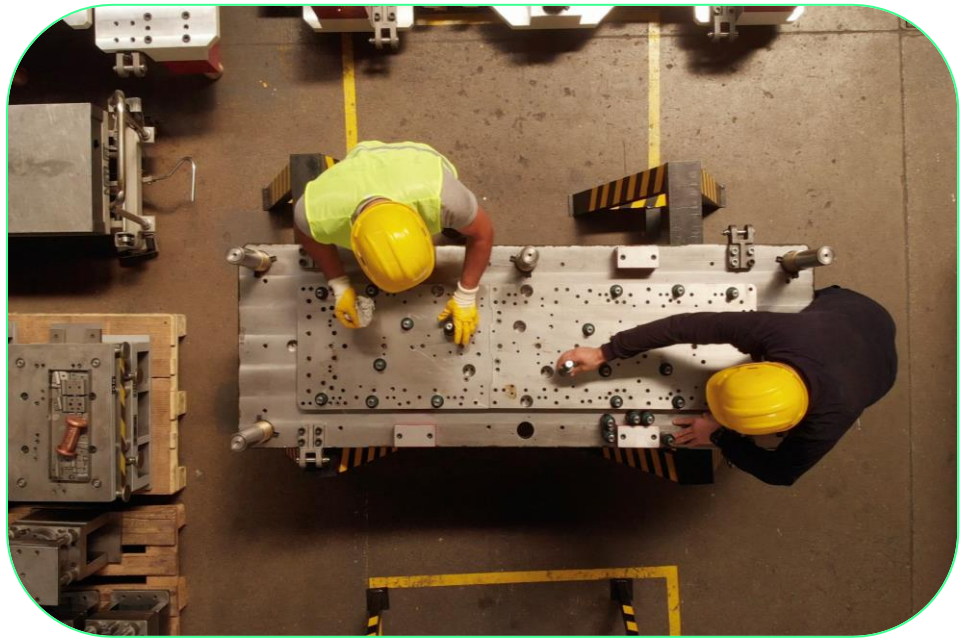
Example #2 – Bio-based Business & Production Consultant

Category: Consulting & Advisory



EQF Level 6-7

Description / Responsibilities of the job

- Advisory on the development of bio-based products and processes
- Application of in-depth industrial knowledge for trend analyses, technologies, suppliers and bio-based processes.
- Design and guidance for business, communication and marketing strategies
- Promote collaboration among bio-based businesses and organisations

Educational background

- Mostly vocational training (higher education degree optional)
- Long-term (5+ years) practical experience in the industry

Essential skills

- Problem Solving
- Critical thinking
- Analytical thinking
- Technology Design

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Example #3 – Bio-based products Artist & Fashion Designer

Category: Arts & Humanities

EQF Level 6

Description / Responsibilities of the job

- Design & prototyping of commercial / industrial bio-based products.
- Clothing, accessories, footwear, etc. using in whole or in part biological, forestry, agricultural materials.
- Fashion trends knowledge (material, colour, style, ...) and consumer-focused design
- Oversight of production process
- Product / design showcase in fashion shows, trade shows, retail

Educational background

- Technical degree in product design / industrial production
- additional training / experience in artistic design etc.

Essential skills

- Task Planning
- Digital design
- Quality control
- Attention to detail
- Design software knowledge

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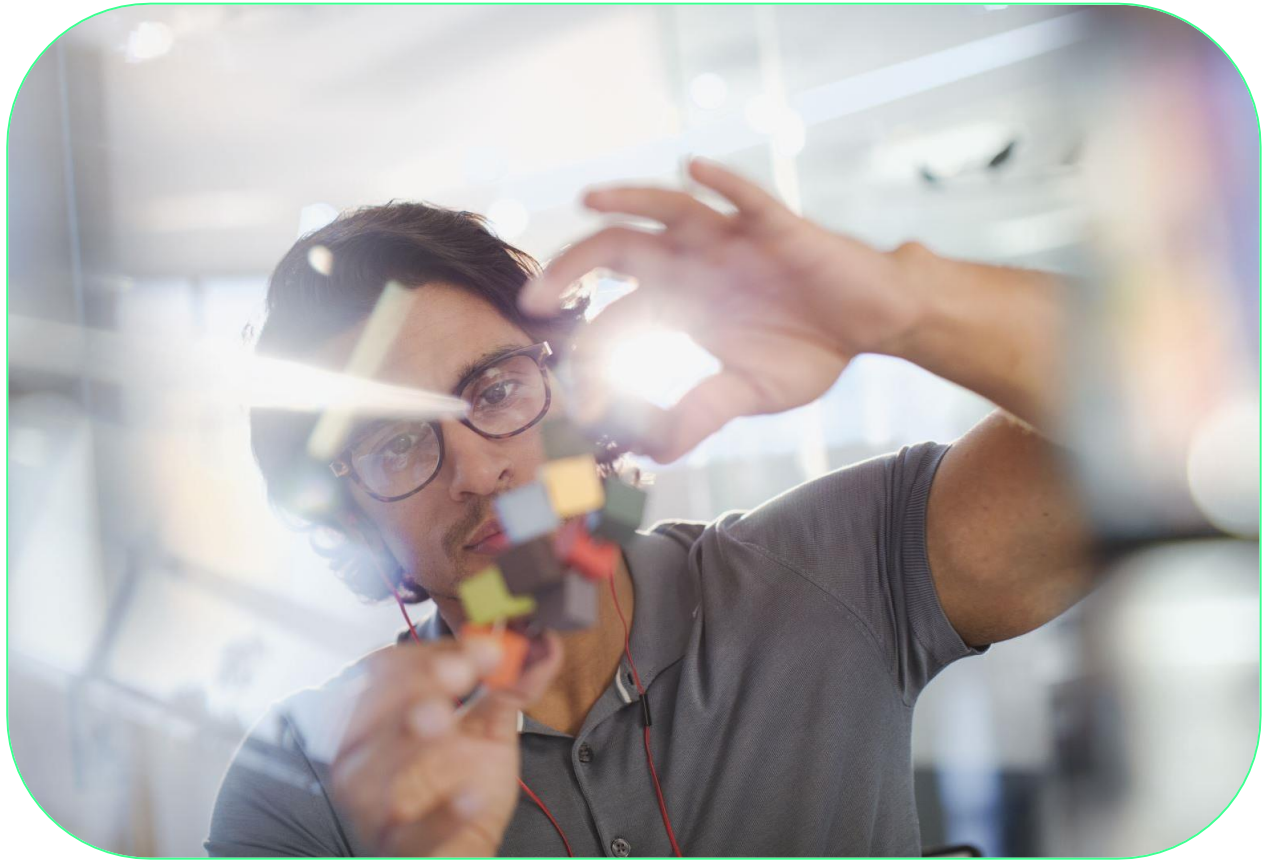
Important skills for bioeconomy jobs of the future



- **Transversal (General) skills**
- **Active learning**
- **Analytical thinking**
- **Systems thinking**
- **Digital and technology skills**
- **Good command of bioeconomy principles** (sustainability, circularity and systems thinking)
- **Specialised technical skills** (waste management, environmental auditing)
- **Entrepreneurial skills**

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04

Useful resources

for bioeconomy careers and studies

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Explore all Bioeconomy job profiles!

Click here

To visit the BioGov.net library

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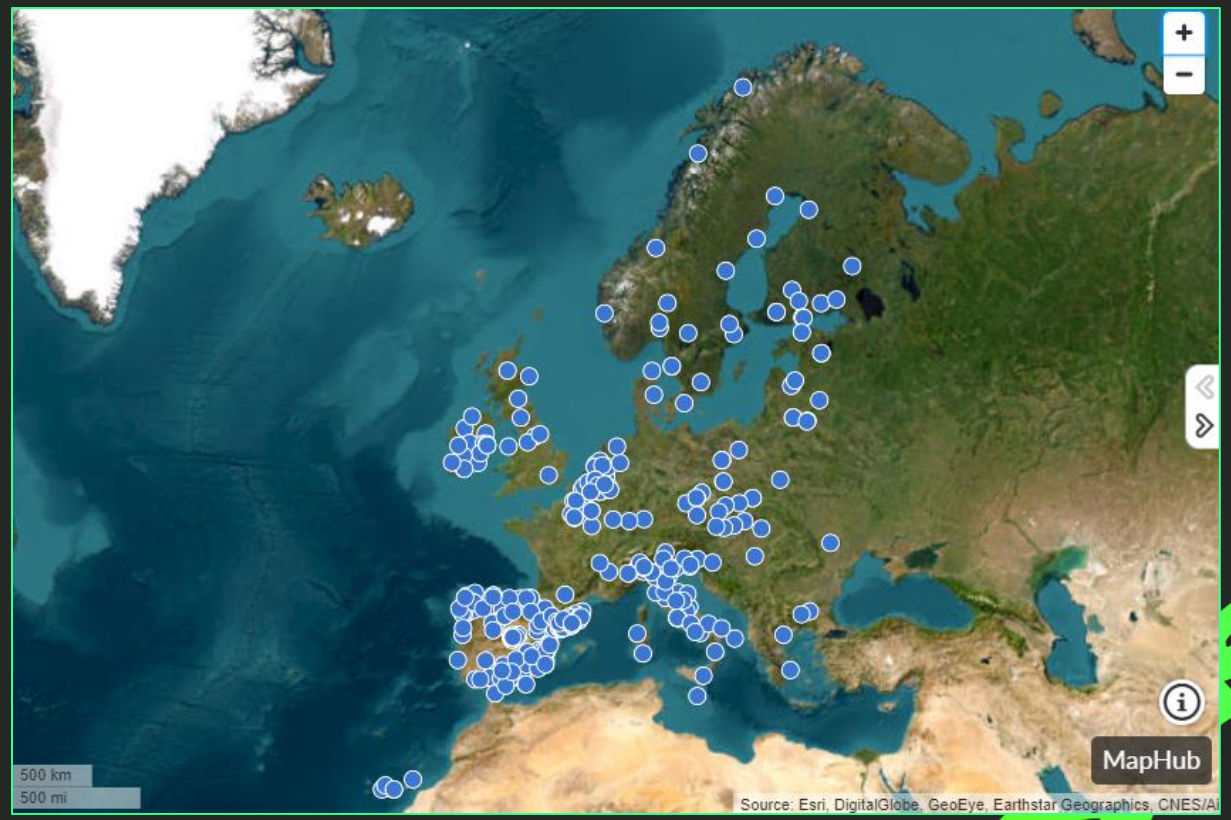
UrBIOfuture
careers, education & research

Explore EU Bioeconomy educational programmes!

Click here

To visit the GenB library



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GenB bioeconomy career infosheets and videos

Coming soon!

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Basic level 1

MODULE 4 – Controversial aspects

Katharina Handler & Juliet Tschank
Centre for Social Innovation (ZSI), Austria

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Bioeconomy and controversial issues

Is all that glitters gold? Is it always sustainable when it is “green”?

- Sustainability of bio-based products
- Biodegradability and end of life
- Greenwashing

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Key sustainabilitiy issues of bio-based products

- **Risks of over-exploitation of natural resources:**
  Resulting in e.g. increasing illegal cutting of trees, soil degradation, groundwater depletion, biodiversity loss, land use change and international disputes, etc.

- **Risk of competition with food and raising food prices:**
  e.g. corn is used to produce many bio-based plastics

- **Environmental performance of bio-based products:**
  Production processes should still be efficient e.g. energy requirements, resource efficiency

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Sustainability of bio-based products

- Are Bio-Based products better by default?
- **Life Cycle Assessment:** a process of evaluating the effects that a product has on the environment over the entire period of its life**)**
- The **compromise between biodegradability and durability/resistance** is still insufficient:
  e.g. fishing nets

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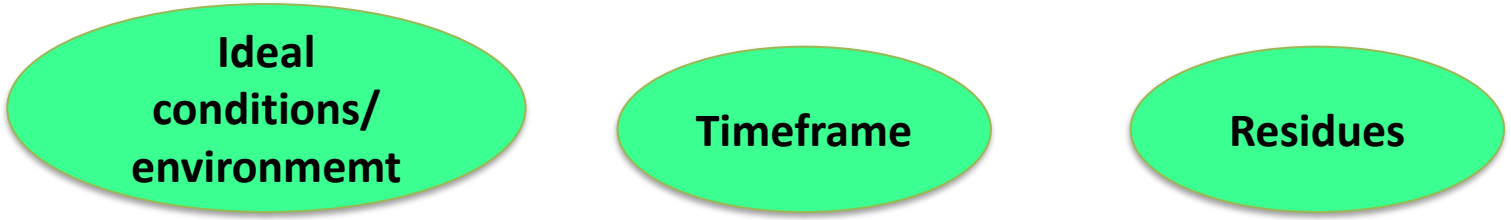
What does biodegradable mean?

- **Biodegradation**: means that a material goes through a chemical reaction in which it uses oxygen and hydrogen from the material itself or from its environment and then dissolves into water and gases such as carbon dioxide and methane or also new biomass. For this reaction to take place, micro-organisms also need to be in place. This means that – in the ideal chemical process – nothing remains of the original material.



https://www.bioeconomy-library.eu/wp-content/uploads/2019/11/InnProBio_Factsheets_combined.pdf

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Biodegradability and end of life

- **Risks:**
  - of being thrown away in the environment (... since it is biodegradable...)
  - **Ecotoxicity** of biodegradable products must always be monitored
  - **Biodegradability may not be the best option for an end-of-life cycle**, better to reduce and recycle where possible.

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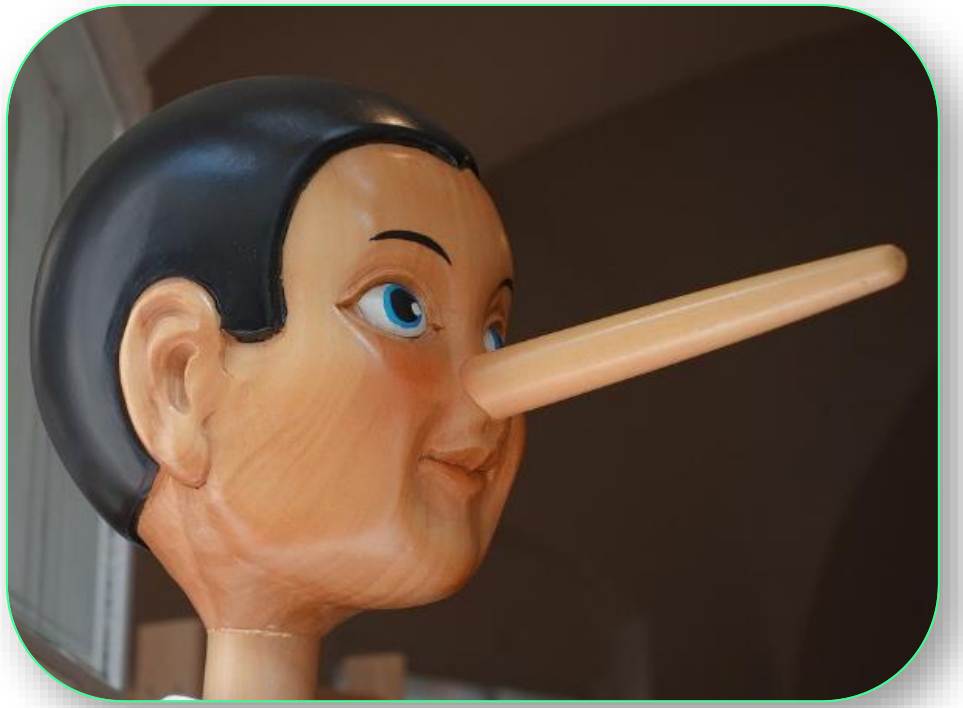
Greenwashing – examples

- **H&M:** claim of misleading consumers about the sustainability of hundreds of products by publishing “environmental scorecards” that contained falsified information.
- **Ryanair**: Advert was banned
- **Zalando** displayed misleading sustainability flags and icons next to products offered on its platform.
  https://ec.europa.eu/commission/presscorner/detail/en/ip_24_948
- **Other examples:**
  https://www.techtarget.com/sustainability/feature/Examples-of-greenwashing-claims



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Greenwashing

- **Greenwashing** is the practice of misleading consumers about the environmental benefits of products and services.
- Consumers have the right for **transparency:** Authentic eco-friendly products provide detailed evidence supporting their claims.
- **Lack of standardisation**: Absence of universally recognised or recognisable eco-labels and standards complicates consumer choices.
- **Terminology misuse**: The misuse of terms like 'green' and 'sustainable' creates confusion and distrust, detracting from genuine sustainability efforts.

Source: Nova Institute

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Greenwashing – possible solutions

- Monitoring of the market by e.g. The EC, national consumer authorities, and civil consumer organisations

- 2 new EC Directives, of which
  - 1 is adopted: Empowering consumers in the green transition
  - 1 under negotiation: Directive on substantiating green claims
  - The European Parliament recently approved the text (17 January 2024), awaiting final approval.

- **Standards, labelling and systems for Life Cycle Assessment** are needed to enable companies, policy makers and consumers to **make informed choices.**

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Thank you !

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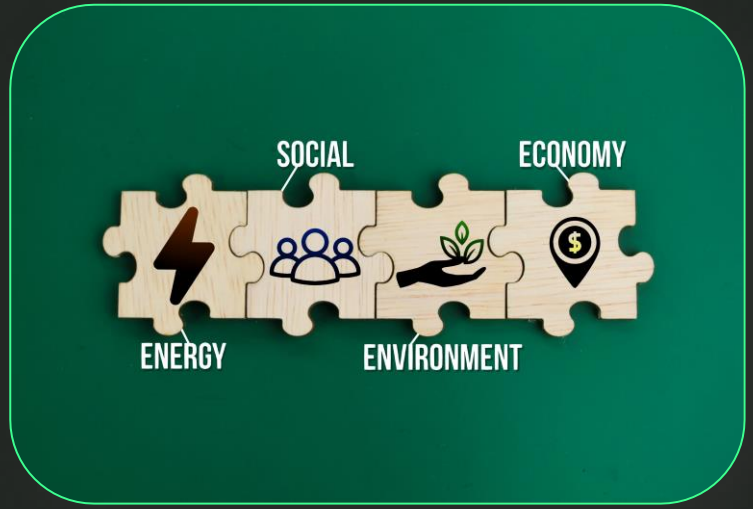

One Person, One Planet: Building a Sustainable Tomorrow

Module 5 – What can I do?

Jana Bieliková, Kristína Kolárová
PEDAL Consulting

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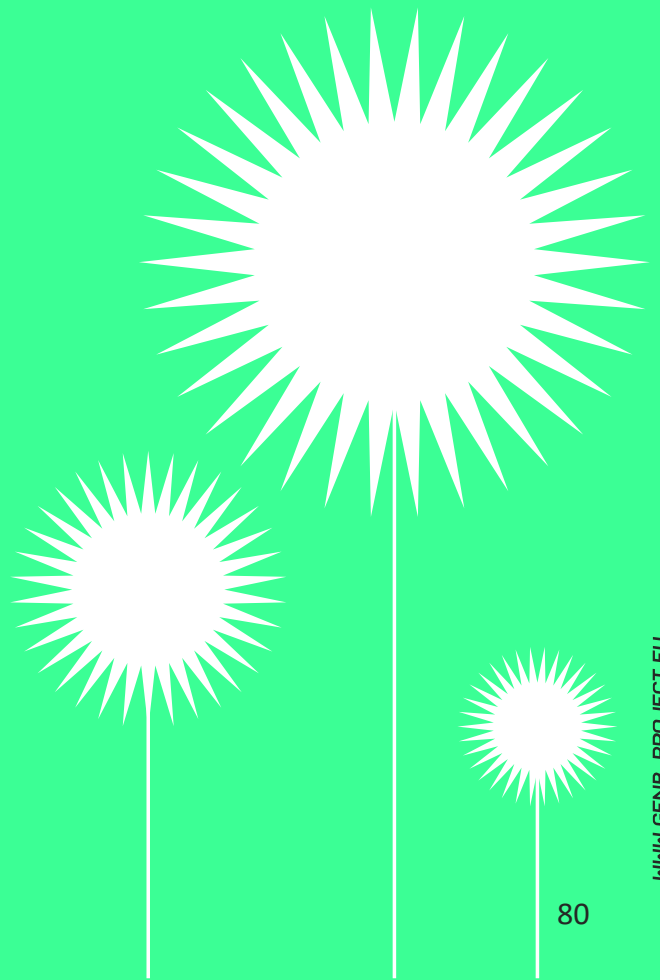
Index



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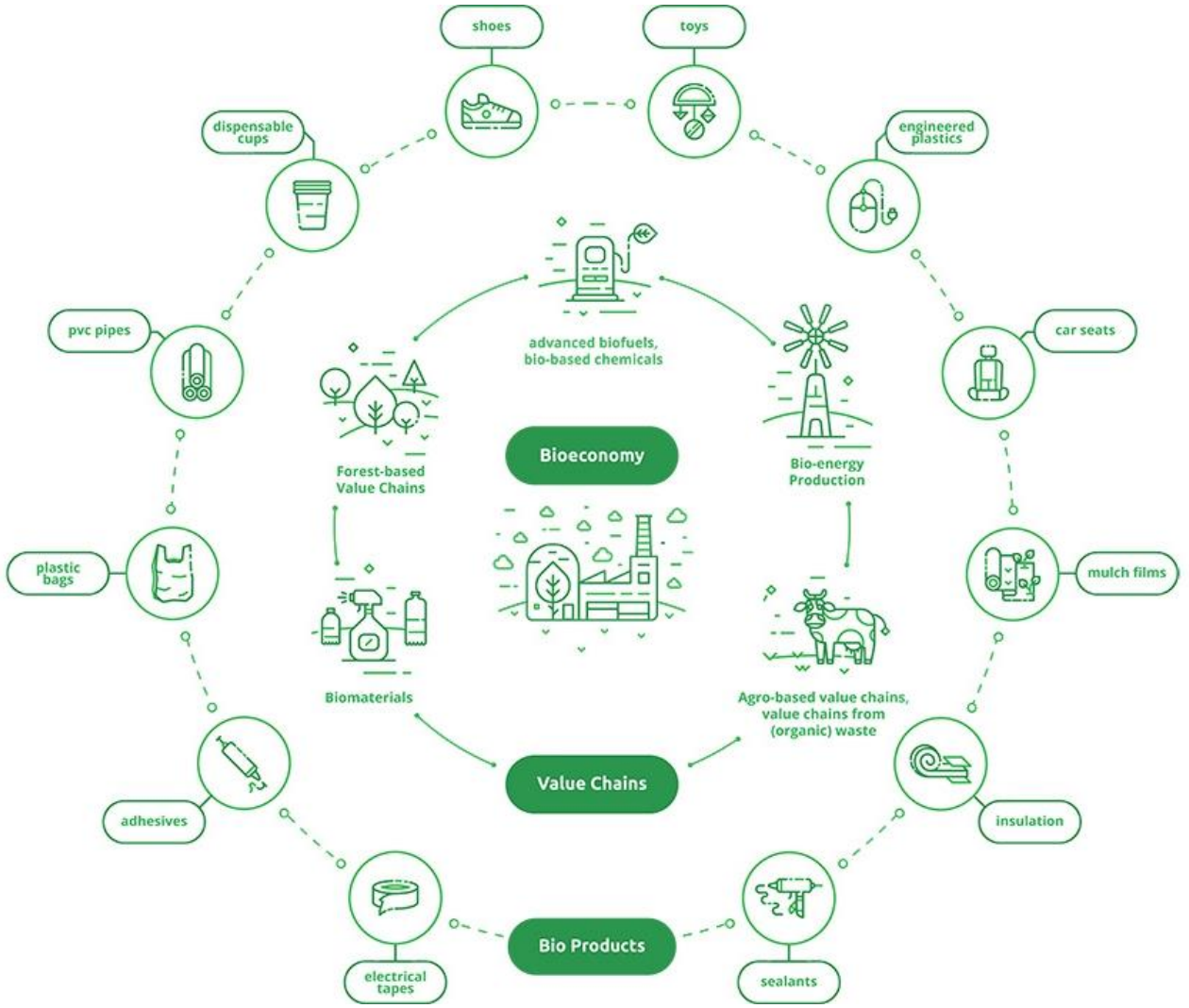
Bioeconomy in Our Daily Lives



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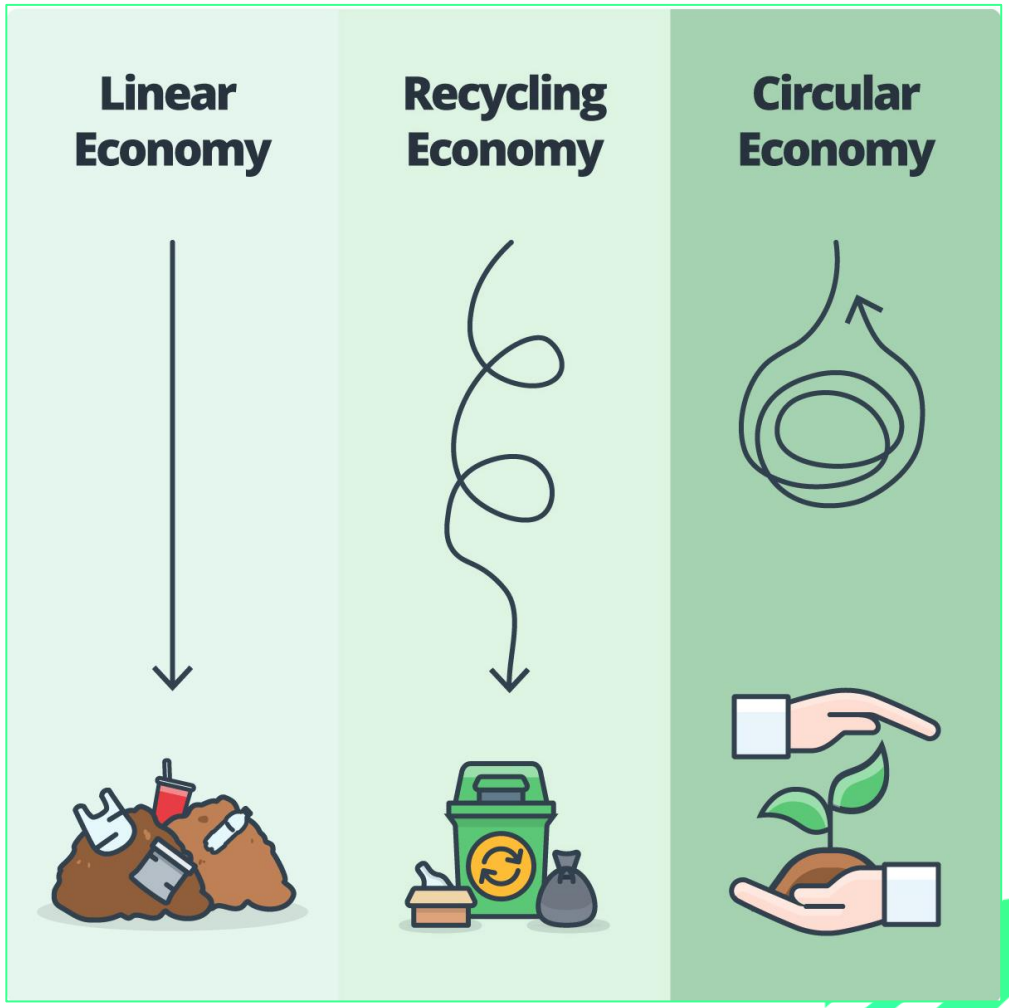
Source: BIOVOICES

Is Bioeconomy Sustainable?

Merely transitioning to bio-based habits does not ensure a more sustainable lifestyle



Source: https://blog.sendle.com/guide-to-circular-economy

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Bioeconomy, Sustainability and Circular Economy

Bioeconomy: an economy where the basic building blocks for materials, chemicals, or energy are derived from renewable biological resources.
Sustainability means using these resources **wisely** so they stick around for the future.
Circular economy aims to minimize waste and maximize resource use through strategies like recycling and reuse.

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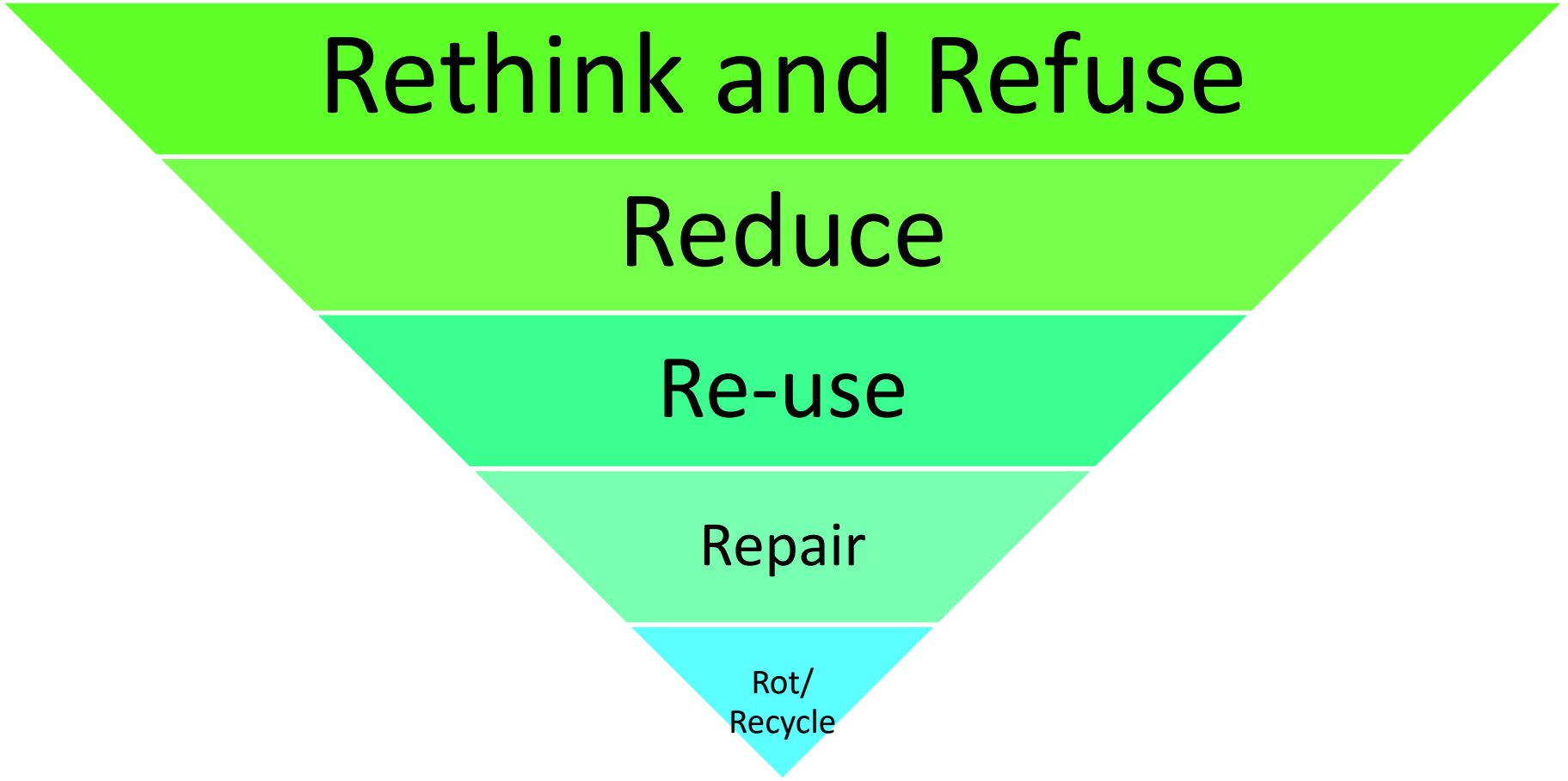
Choose the Better Option



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Food

Plan your meals

Support local and seasonal foods

Prepare your own meal

Collect scraps for composting

Grow herbs or vegetables at home

Promote plant-based and fairtrade eating habits

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Clothing

- Buy Less, be conscious
- Upcycle and recycle
- Rent or swap
- Choose eco-friendly fabrics
- Support sustainable brands

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Plastics

No to single-use plastics

Buy products with less packaging

Separate waste

Opt for reusable and biodegradable items

Choose sustainable packaging

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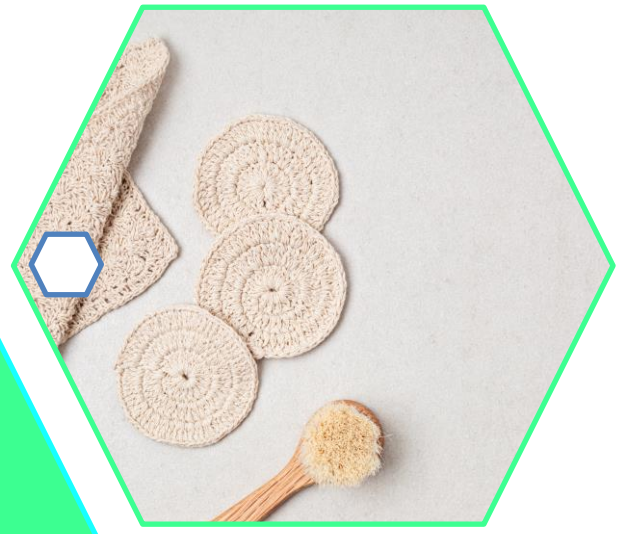
Hygiene and Cosmetics



Reduce single use items

Use biodegradable and eco—friendly / DIY cosmetics and cleaners

Get biodegradable toiletries

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Community Practice

- Create awareness-raising initiatives
- Initiate a local library of things
- Promote hand-me-downs
- Start a community garden
- Initiate clean-up campaigns

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Resources:

- Embracing the 5R Strategy at Home: A Path to Sustainable Living
- The 5 R’s of Waste Management and Zero Waste Living
- GenB project Library
- 9 Tips for Sustainable Eating
- Eight tips for eating for the planet
- Sustainable Fashion Habits
- AllThings.Bio Podcast – Episode 3: Don’t say green fashion, say bio-circular fashion
- Unveiling Sustainable Habits: How to Reduce Plastic Consumption and Protect Our Environment
- Sustainable Beauty: Redefining Beauty With Sustainability

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MODULE 6 - BIOECONOMY AND SUSTAINABILITY CHALLENGES

Dr. Xanthi Chantzistrountsiou
Hellenic Society for the Protection of Nature (HSPN)

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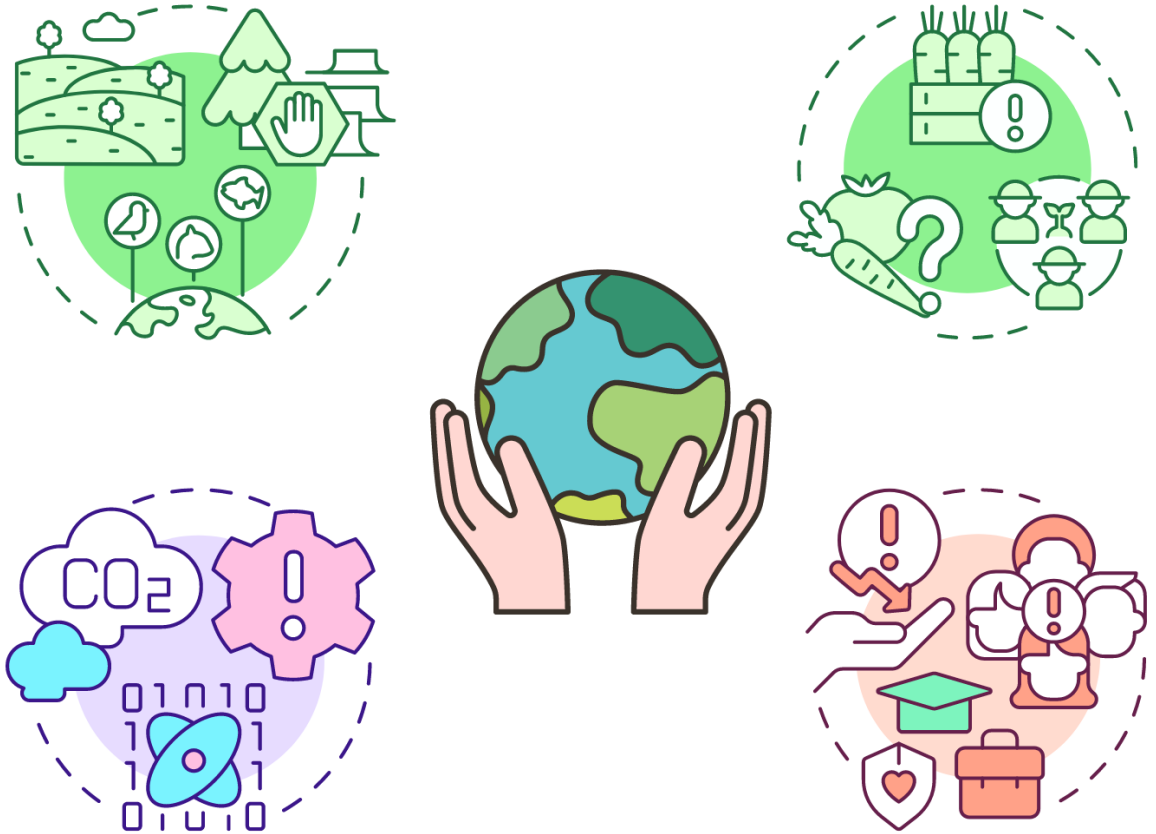
Sustainability challenges to overcome in the coming years

- Mitigating climate change
- Achieving Sustainable Development Goals (SDGs)
- Reducing Pollution
- Efficient use of resources
- Energy needs
- Biodiversity
- Healthy soil
- Healthy food for all
- Socio-economic impacts



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1. Bioeconomy and Climate Change Mitigation

Primary Production

Circularity

Industrial Innovation

Source: fao.org

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2. Pollution Reduction

Recycle-Reuse-Reduce waste

Produce, consume & live with **respect**

Biological **renewable** resources, instead of fossil ones

Secondary raw materials (**circularity**)

Reduced use of plastics (non-biodegradable materials)

Bioeconomy → Innovation → **Sustainable Change**

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3. Bioeconomy and Energy Needs

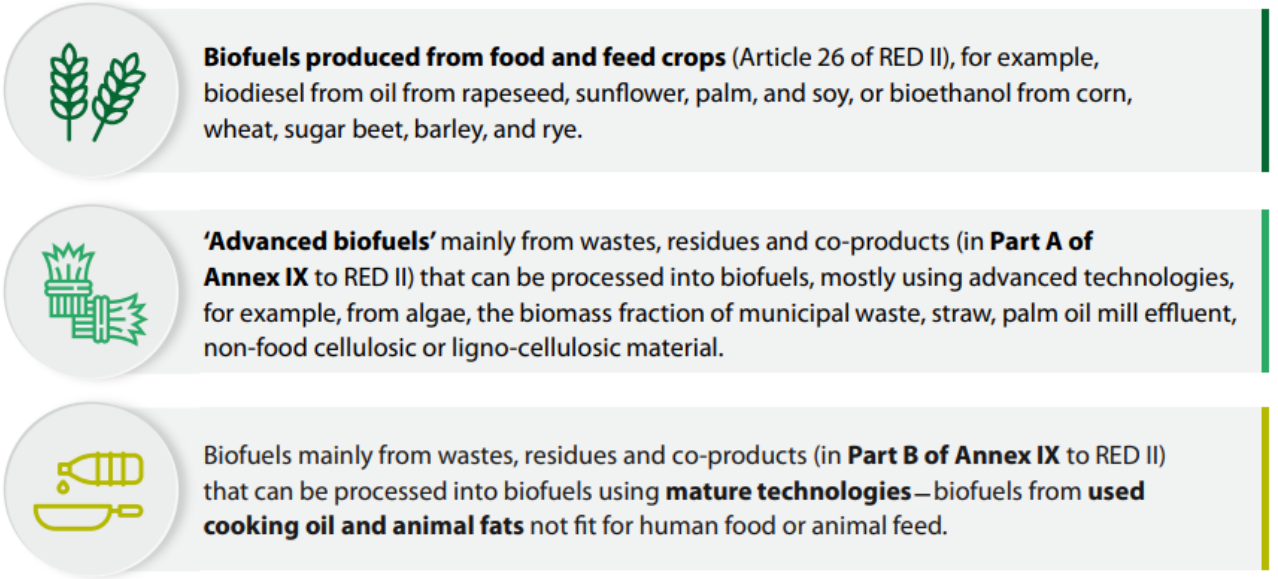
Renewable resources ⇨ non-polluting alternatives to fossil fuels

BIOFUELS from

- **waste materials** (e.g. agricultural waste and used cooking oil)
- **biomass** grown in marginal areas (e.g. polluted)

Additional benefits

- ✓ sustainable management of **forests**
- ✓ valorisation of **underutilised resources**



Source: ECA.

Main categories of biofuels by feedstock. Source: European Court of Auditors (ECA) Special Report: The EU's support for sustainable biofuels in transport.

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4. Bioeconomy and Efficient Use of Resources

Use of waste materials to make **new products** (circularity)

Scientific research for new materials

Integrated production chains (e.g. **biorefineries**)

Innovative product **design**

Source: Hall-Geisler, K. Eco-friendly Paper Made from Poop

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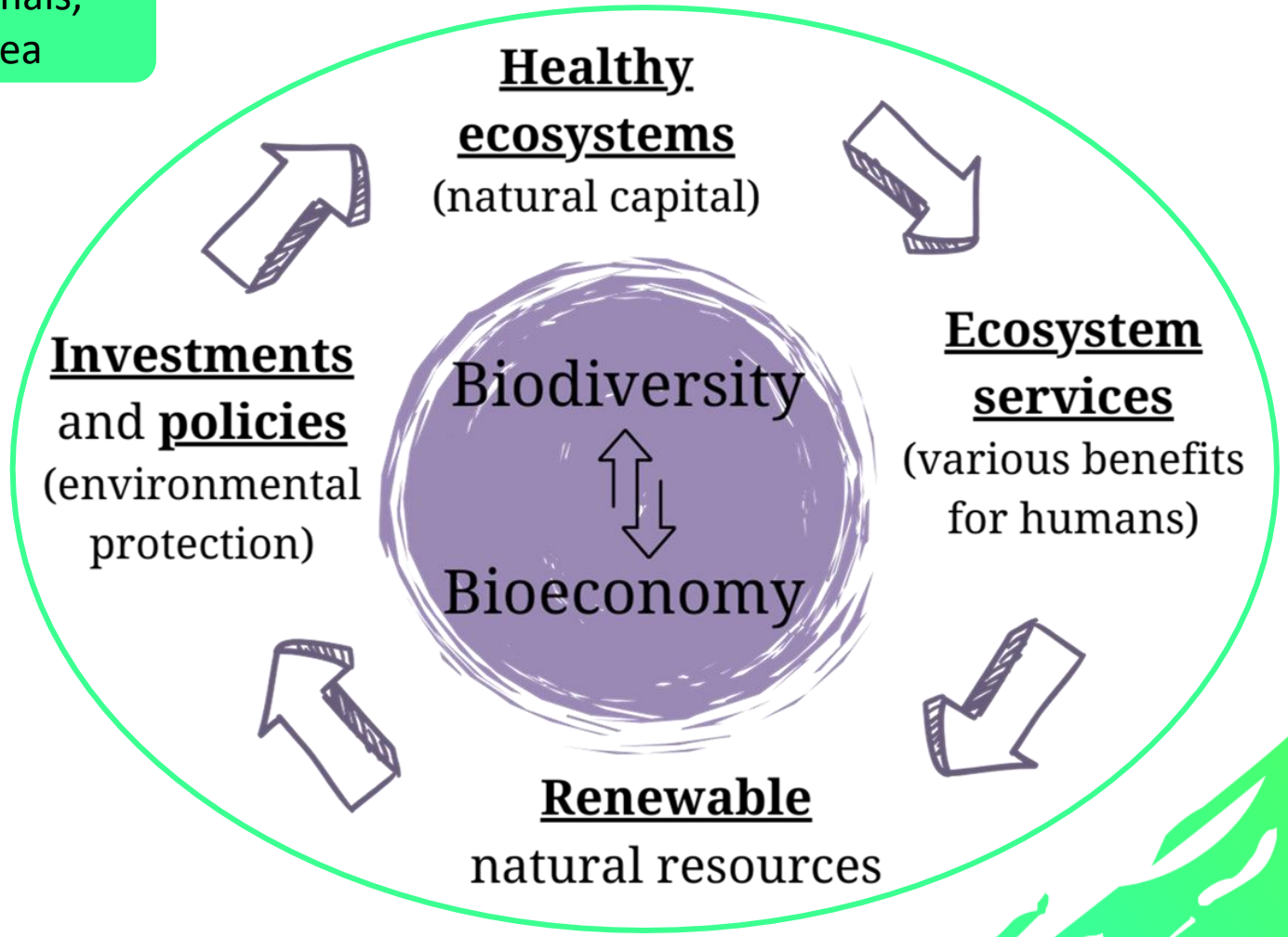
5. Bioeconomy and Biodiversity

Biodiversity = All living things (plants, animals, fungi, microorganisms) that live in an area



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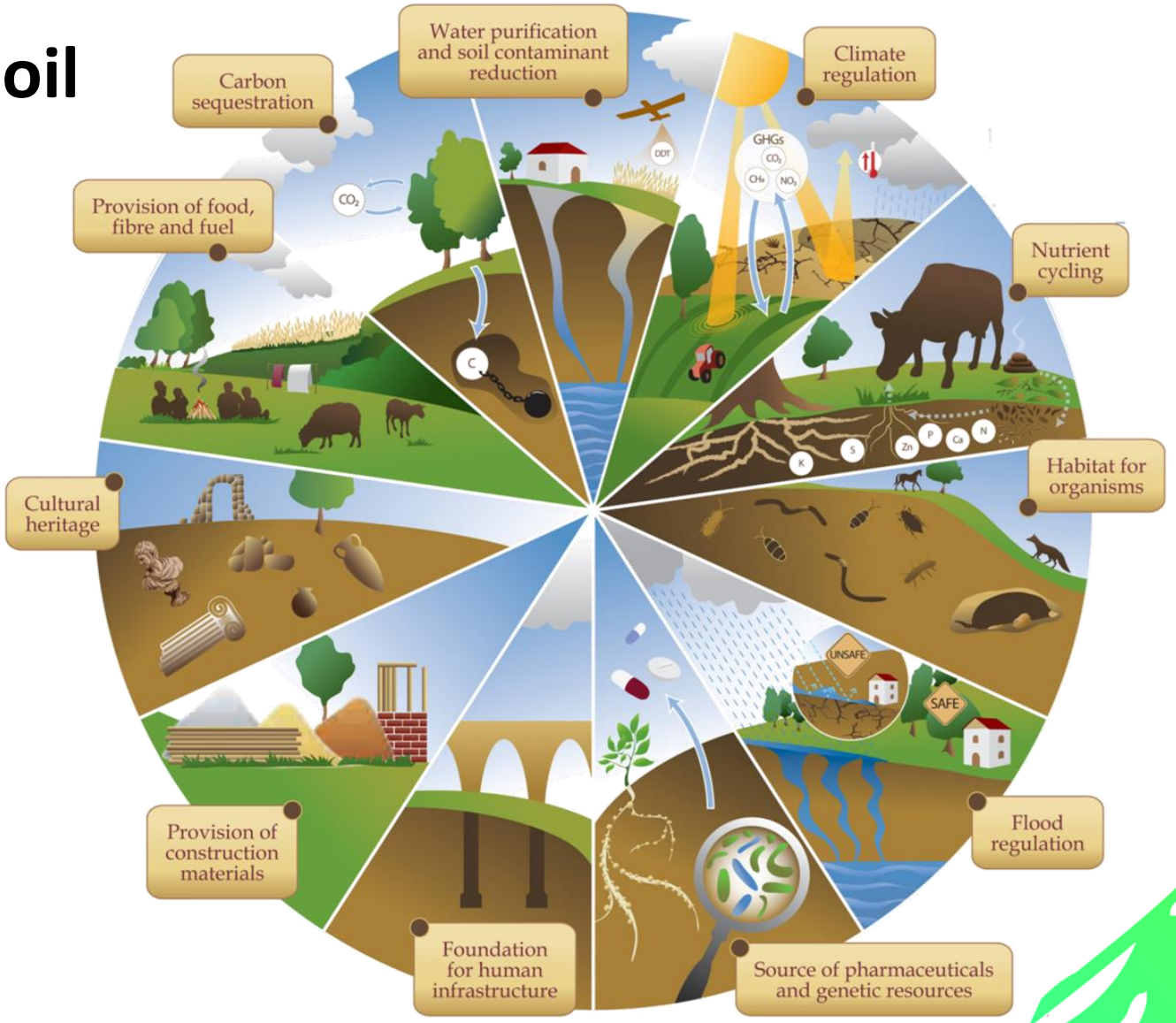
6. Bioeconomy and Healthy Soil

- essential, non-renewable resource for agriculture
- basis to produce food, fibre, and other circular economy resources
- supports biodiversity
- central role in carbon sequestration and storage



Ecosystem services provided by healthy soil.
Source: Soil Functions, fao.org

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What's bioeconomy's contribution to healthy soil?

- responsible use of resources
- biopesticides and biofertilizers
- biodegradable mulching films
- sustainable agricultural practices
- organic compost nourishes the soil

Source: Agricultural and rural development, European Commission

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7. Bioeconomy and Healthy Food for All

Balanced, sustainable and **healthy diet**

Waste reduction

Biofertilizers and **biopesticides** (not harmful)

Valorisation of by-products as resources

New **food sources**

New **income** opportunities

Rural development

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8. Socio-Economic Impacts

Positive impact on

- ✓ Rural development
- ✓ Local jobs

Sectors where inequalities could arise:

- ✓ Income
- ✓ Power
- ✓ Access to resources
- ✓ Community and cultural life

Bioeconomy employment and value added: 2019 data
Source: data.europa.eu

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References and Resources

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- Food Navigator Europe
- A Capitals Approach for a Sustainable Bioeconomy
- Soil Functions
- Agricultural and rural development, European Commission.
- Healthy Food For All
- BIOSWITCH Case Study 5: La Union
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- Kristen Hall-Geisler "Poo-pyrus: Eco-friendly Paper Made from Poop"
- Stegmann et al. 2020. The circular bioeconomy: Its elements and role in European bioeconomyclusters
- *European Union Bioeconomy Employment Value Added 2019*
- *BIOSTEP Summary Report on the social, economic and environmental impact of the bioeconomy*

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- Questions
- Remarks
- Suggestions
- Feedback

Ask away!

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Thank you !

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Special thanks to Susanna Albertini (FVA) and John Vos (BTG)

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Capacity Building Webinars Basic level 1

Module 7 - Raising awareness and education in bioeconomy

FVA - New Media Research

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BIO...
WHAT?

Raise awareness, interest and knowledge on the environmental, social and economic benefits of sustainable and circular bioeconomy

Educate young people to promote sustainable and circular behaviours, consumptions and lifestyles

Engage and empower the new generations to **take an active role** in the transition

BIO... WHAT?

BIO... HOW?

BIO... ACT

The conceptual model BIOWHAT, BIOHOW and BIOACT

Funded by the European Union

01

Inspirational formats

From several EU-funded projects

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The citizens of tomorrow

- Large scale events, science festivals, museum exhibitions
- BioArt Gallery to inspire through art and emotions
- Touch, feel and smell the bioeconomy through and exhibition of more than 350 bio-based products










300.000 people directly reached

The citizens of tomorrow

- Hands-on labs and experiential learning

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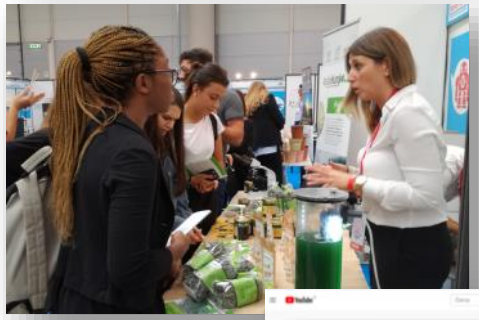
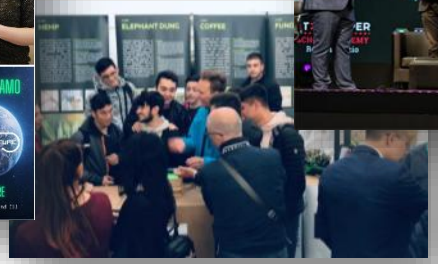
Future workforce and decision makers

- Pitches, “circular bioeconomy stories” (researchers, SMEs, Startups)
- School projects
- Study visits (industries, biorefineries)







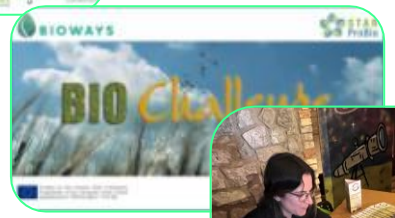


Educate the little ones speaking their language

Books

Games

School activities



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BIOVOICES book for kids

Bioeconomy book for kids from 5 to 8 years

- 80 pop-up windows in daily life situations
- Circular Bioeconomy & sustainability, SDG, biodiversity
- 33 members of the scientific committee
- 15 languages
- 25.000 copies (last few copies in distribution now)
- Online version

How was the book used?

- Inspire the citizens of tomorrow
- Attract towards bioeconomy careers
- Train teachers to use the book in school curriculum
- In distribution in schools, libraries, museums, all over the world

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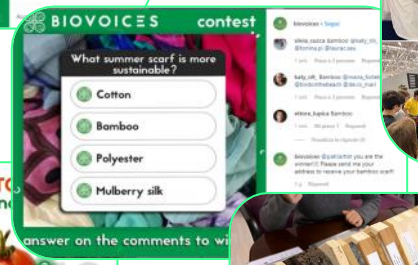
EDUCATE

Educate young people providing stimulating contents

- Quizzes and games
- Social media activities
- Educational cards
- Videos
- Toolkits



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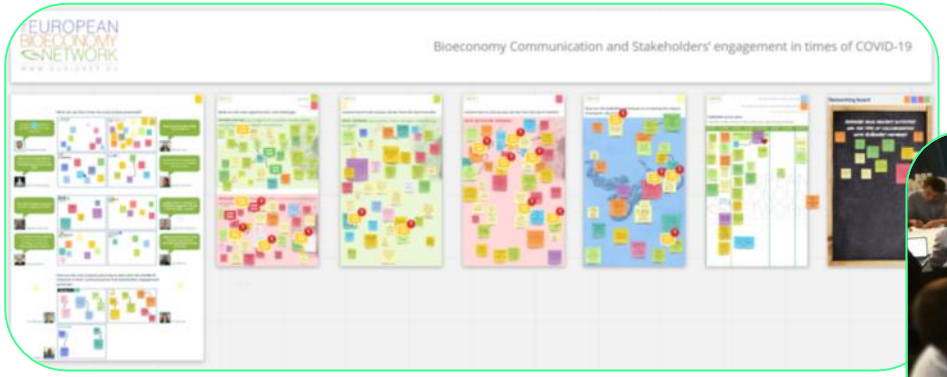
CO-CREATE



Living labs (young people + families + educators)

Mobilisation and mutual learning

Debates

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the European Union

From Students2Students

Engage and motivate

Empower

Support (tools and opportunities)

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Thank you!

CONTACT US

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OUR CONSORTIUM:

APRE – Agenzia per la Promozione della Ricerca Europea

btg biomass technology group

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FVA NEW MEDIA RESEARCH

Hellenic Society for the Protection of Nature

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GENB
YOUNG BIOVOICES
FOR A SUSTAINABLE
FUTURE

Capacity building webinars

Conclusion: GenB and your contribution

Katharina Handler, Juliet Tschank (ZSI)

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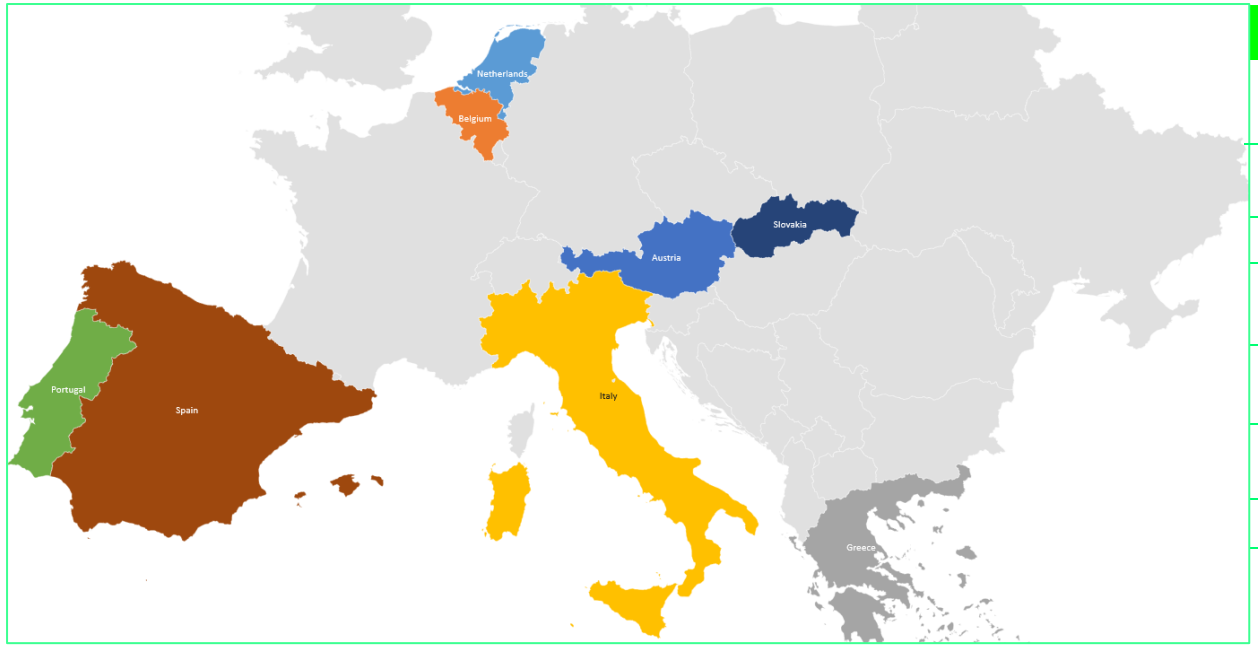
Any more questions, concerns, queries etc.? → Your GenB regional partners



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