



Opportunities and challenges for promoting education and training to provide the skills for the developing of bioeconomy

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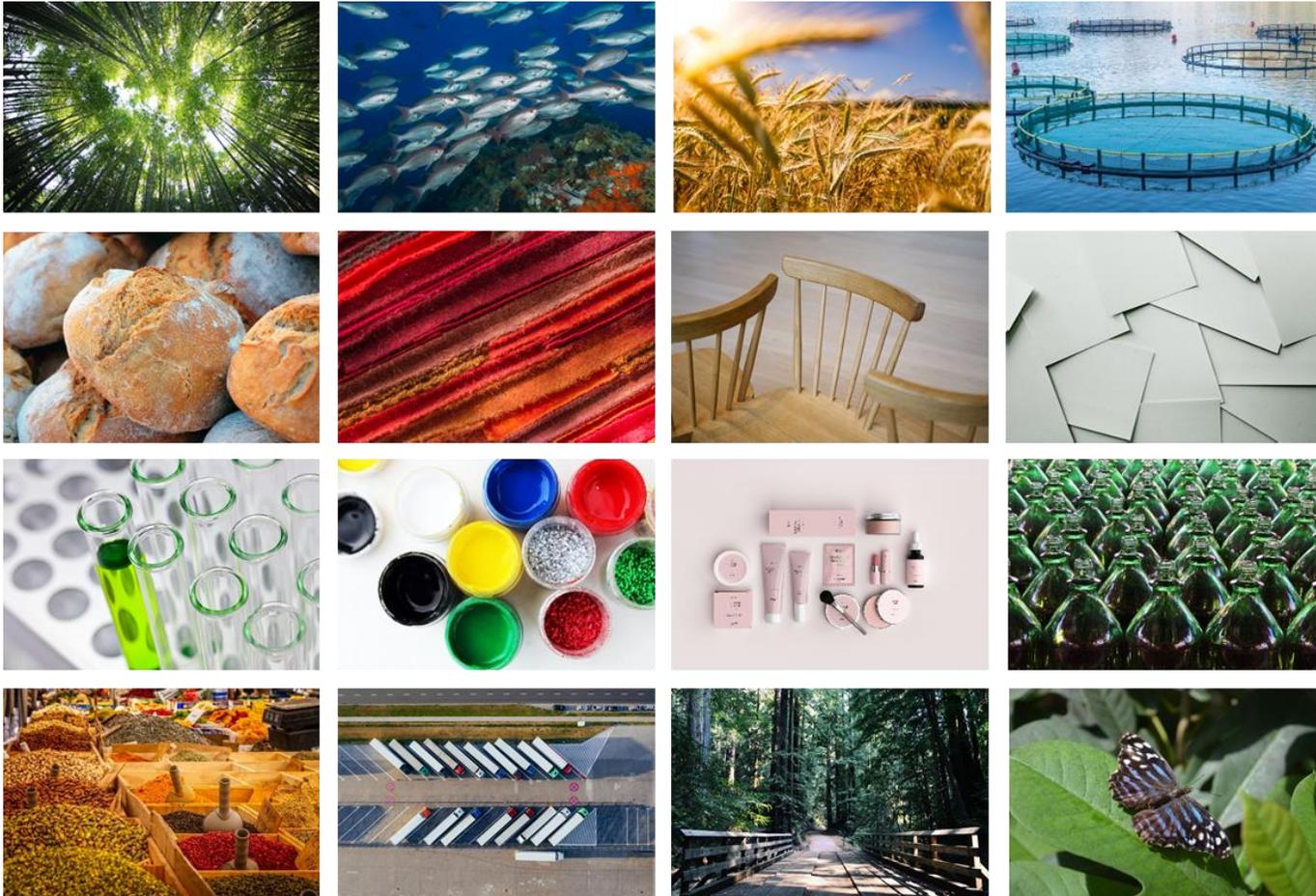
Ghent, 19/05/2022

Content:

- The **Bioeconomy in the EU**
- The **policy context: European Green Deal** and the **new geopolitics** - The bioeconomy provides solutions to meet the ambition and the associated challenges
- **Bioeconomy Education**

What is the EU's understanding of the bioeconomy?

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



Primary production: agriculture, forestry, aquaculture, fisheries – incl. waste/side streams

Processed biomass: Food, feed, fibre, fuel and other materials

Bio-based materials industry: fuels and bio-energy, biochemicals, biocosmetics

Services incl. ecosystem services, e.g. carbon farming, biodiversity



EU BIOECONOMY

European Commission's Knowledge Centre for Bioeconomy

EMPLOYMENT
(MILLION JOBS)
17.4

VALUE ADDED
(BILLION EUR)
657

	EMPLOYMENT (MILLION JOBS)	VALUE ADDED (BILLION EUR)	VALUE ADDED (SHARE TOT)
AGRICULTURE	8.8	193	29%
FORESTRY	0.5	25	4%
FISHING AND AQUACULTURE	0.2	6	0.9%
FOOD, BEVERAGES AND OTHER AGRO-MANUFACTURING	4.7	237	36%
BIO-BASED TEXTILES	0.8	25	4%
WOOD PRODUCTS AND FURNITURE	1.3	50	8%
PAPER	0.6	48	7%
BIO-BASED CHEMICALS AND PHARMA- CEUTICALS, PLASTICS AND RUBBER	0.5	65	10%
LIQUID BIOFUELS	0.03	3	0.5%
BIOELECTRICITY	0.03	5	0.8%

A key sector of the EU economy

- ~8.3% of the EU workforce
- ~78% employed in Food, beverages, tobacco and Agriculture sector (and 65% of value added)
- 4.7% of GDP
- **Sectors with “High value added/person employed”**
e.g. bio-based pharmaceuticals, chemicals and plastics

European bioeconomy policy development

2012



Communication on Bioeconomy

2017



Review of Bioeconomy Strategy

2018



Updated Bioeconomy Strategy

Sustainability

Circularity

System-wide approach

1

STRENGTHEN AND SCALE-UP THE BIO-BASED SECTORS, UNLOCK INVESTMENTS AND MARKETS

- Mobilise stakeholders in development and deployment of sustainable bio-based solutions
- Launch the EUR 100 million Circular Bioeconomy Thematic Investment Platform
- Analyse enablers and bottlenecks for the deployment of bio-based innovations
- Promote and develop standards, labels and market uptake of bio-based products
- Facilitate the development of new sustainable biorefineries
- Develop new biodegradable products, including bio-based plastic substitutes

2

DEPLOY LOCAL BIOECONOMIES RAPIDLY ACROSS EUROPE

- Launch a Strategic Deployment Agenda for sustainable food and farming systems, forestry and bio-based products
- Launch pilot actions for the development of bioeconomies in rural, coastal and urban areas
- Support regions and Member States to develop Bioeconomy Strategies
- Promote education, training and skills across the bioeconomy

3

UNDERSTAND THE ECOLOGICAL BOUNDARIES OF THE BIOECONOMY

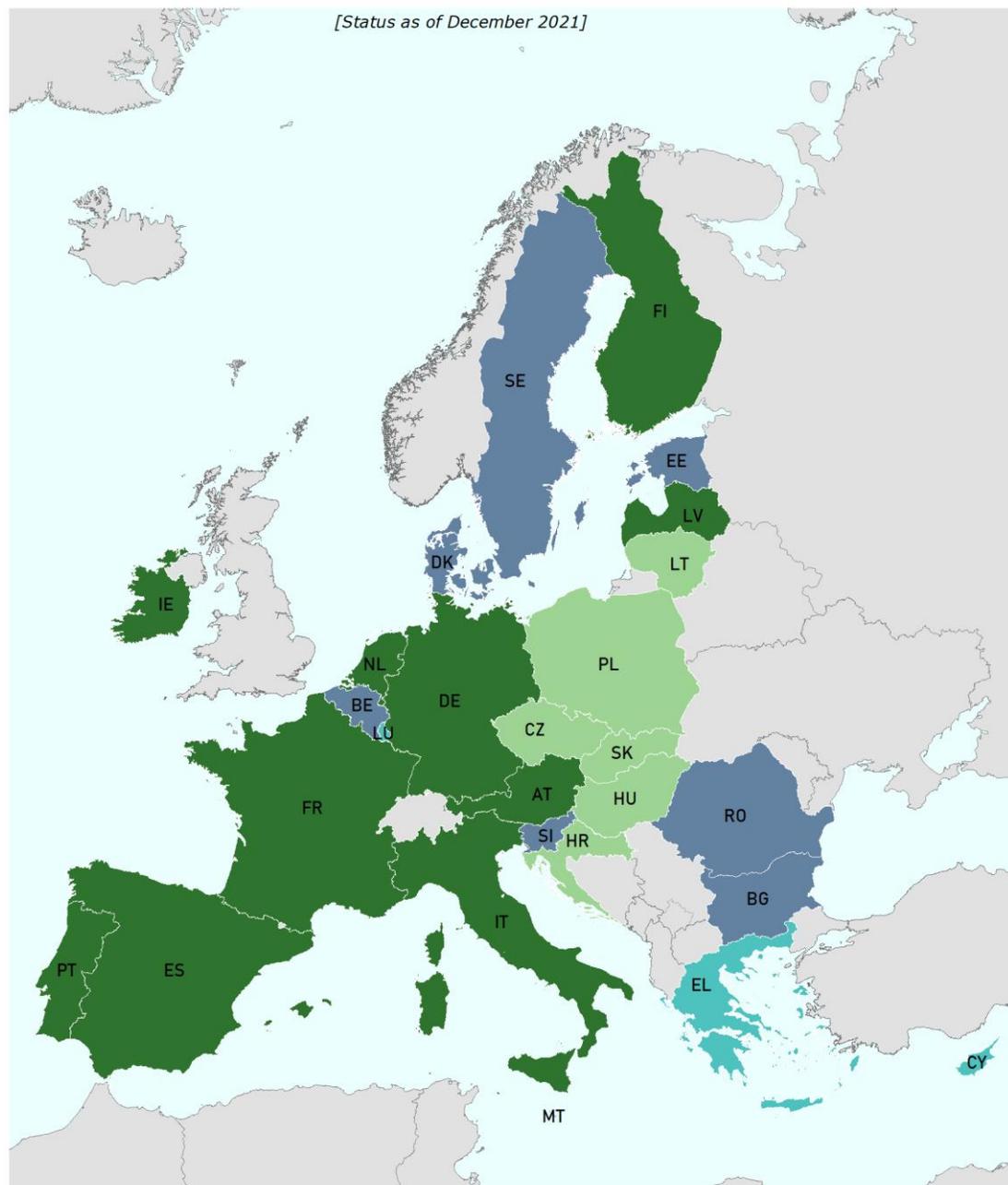
- Enhance knowledge on biodiversity and ecosystems
- Monitor progress towards a sustainable bioeconomy
- Promote good practices to operate the bioeconomy within safe ecological limits
- Enhance the benefits of biodiversity in primary production

[Status as of December 2021]

Status of the national bioeconomy policies in the EU-27

(as of Dec 2021)

- 10 Member states with dedicated bioeconomy strategies at national level (AT, DE, ES, FI, FR, IE, IT, LV, NL, PT)
- 6 MS in the process of developing their respective dedicated national strategies (CZ, HR, HU, LT, PL, SK)
- 7 MS are involved in other macro-regional (BG, DK, EE, RO, SI, SE) or sub-national (BE) policy initiatives dedicated to the bioeconomy.
- 4 MS have bioeconomy related strategies (CY, EL, LU, MT)



Status of national bioeconomy strategies:

- Dedicated bioeconomy strategy at national level
- Dedicated bioeconomy strategy at national level under development
- Other policy initiatives dedicated to the bioeconomy
- Other related strategies at national level

Source: EC's Knowledge centre for Bioeconomy
Administrative Boundaries:
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Importance of the bioeconomy

within the identified strategies & the status of such strategies

Regions with fully dedicated bioeconomy strategies

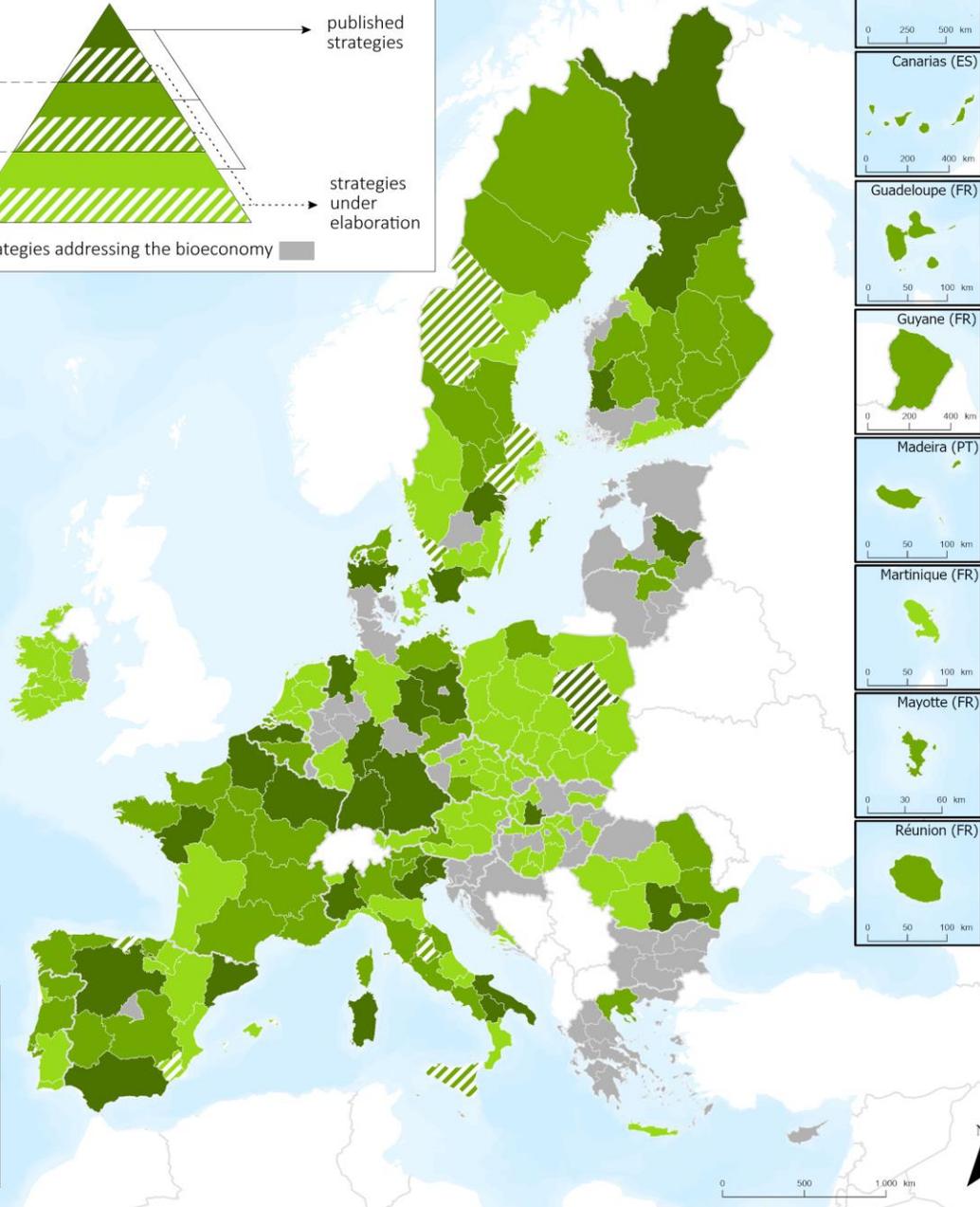
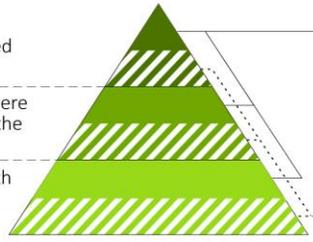
Regions with strategies where the bioeconomy is one of the key elements

Regions with strategies with a minimum bioeconomy content

Regions without strategies addressing the bioeconomy

published strategies

strategies under elaboration



Status of the regional bioeconomy policies in the EU-27 (as of Nov 2021)*

- 28 EU regions have dedicated strategies developed and 1 region under development.
- 68 EU regions have adopted policies where bioeconomy is a key element while in 7 additional regions such strategy is under development.
- 94 EU regions have released strategies with a minimum bioeconomy content and in 2 regions are still under development.

*Based on the “Study on mapping the deployment of regional bioeconomies in Europe” commissioned by Knowledge Centre Bioeconomy (KCB)

Data source: Survey by ÖIR/S4S (Nov. 2021), elaborated for JRC, Study on mapping the deployment of regional bioeconomies in Europe (2022).
Background source: EUROSTAT; ESRI, FAO, NOAA



Recent EU policy developments



”

“The European Green Deal is Europe’s Man on the Moon Moment” December 2020

“The fossil fuel economy has reached its limits!” July 2021

#EUGreenDeal



European
Commission

Food Security Communication (23rd March 2022)

Safeguarding Food Security and Reinforcing the Resilience of Food Systems“

Direct and indirect food security impact of the war in Ukraine

RePower EU (8th March 2022)

Joint European action for more affordable, secure and sustainable energy

European Commission proposed an outline of a **plan to make Europe independent from Russian fossil fuels well before 2030**, starting with gas, in light of Russia's invasion of Ukraine. E.g. through larger volumes of **biomethane**



“ *With its potential to connect and implement transformative policies holistically, the bioeconomy will contribute to all dimensions and objectives of the European Green Deal. Research and innovation will enable Europe to lead the green and digital transition.* ”

Mariya Gabriel, EU Commissioner for Innovation, Research, Culture, Education and Youth

*Research and
Innovation*

Bioeconomy - a blueprint for green growth which:

- Holistically addresses the economic, social and environmental aspects
- Contributes to a climate-neutral future
- Promotes resource efficiency and circularity
- Reduces dependence on non-renewable resources
- Safeguards biodiversity and ecosystems
- Provides opportunities for fair and just transition
- Green business opportunities for SMEs

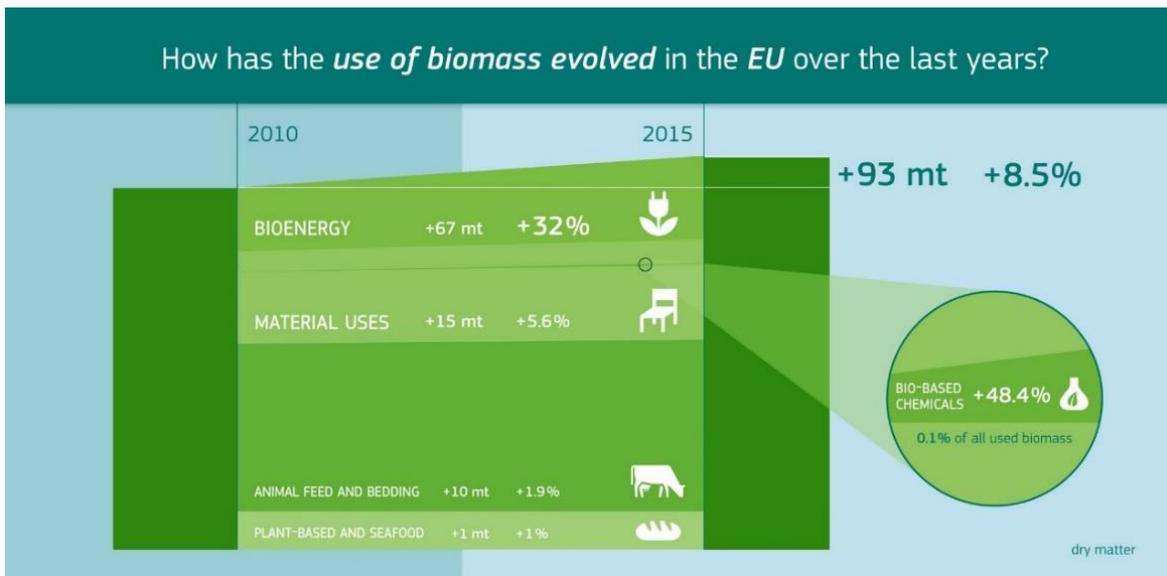
See Factsheet on [How the bioeconomy contributes to the Green Deal](#)

EU - Biomass supply and uses

- EU uses 1.2 billion tonnes of biomass dry matter,
- 1 billion is from primary production (mostly originating in the land-based sectors) and
- Forestry is the second largest source of biomass
- 0.2 billion secondary sources (circular/cascading use)

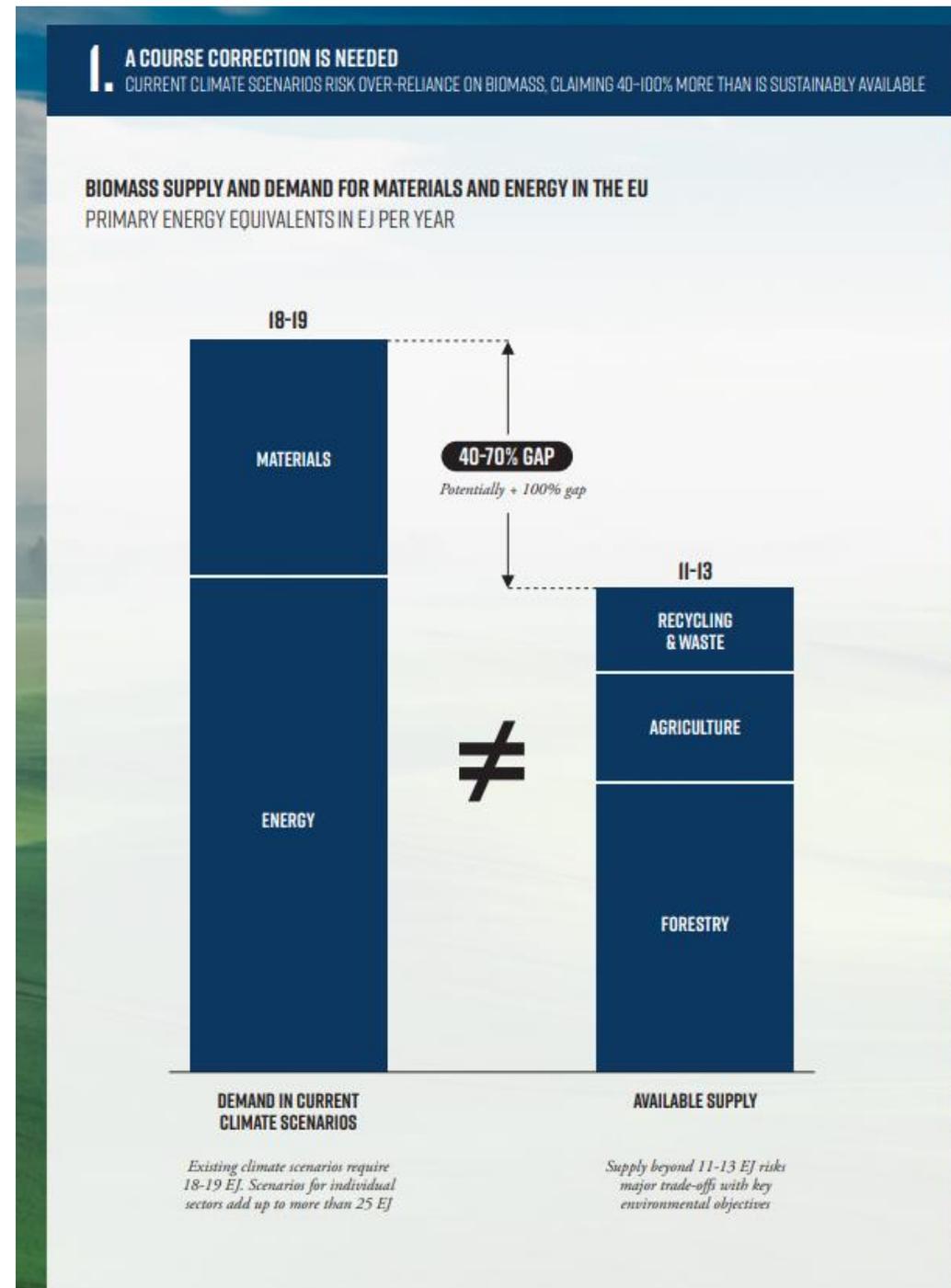
Potential to increase for bioeconomy?

- **46% of agricultural production residues** (leaves, stems, husks) – largely unused but needed for soil quality
- **Dietary shift** (lower meat consumption) can reduce the need for animal feed production = free land for industrial crops
- **Primary production** in the EU has had a strong growing trend over the last decades but also **new challenges**: climate change (adaptation needs), biodiversity and land sink decline



Biomass Supply Potential

- Fritsche et al. (2020) state that some 500 Mt_{dm} could be produced sustainably by 2030 for additional uses (45% increase over current supply)
- Material Economics (2021) estimated maximum sustainable increase of supply of 10-30% by 2050
 - Still 40-70% gap compared to the projected demand in integrated climate scenarios
 - Proposes a framework for prioritization of biomass + uses towards high-value applications



'Bioeconomy Strategy Action' in Sustainable Carbon Cycles Communication (December 2021)

- The EU will develop methodologies and carry out an **integrated EU bioeconomy land-use assessment**, with the aim of ensuring consistency of aggregated national and EU policies and targets, and provide technical assistance to Member States to carry out national assessments in support of their bioeconomy policies.

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Study focus & specific objectives

Study focus



Higher education

Vocational education & training (VET)

Entrepreneurship training

Specific objectives of the study



1. Provide overview of **current training and education availabilities** at different levels concerned by the study.
2. Provide overview of **current and future (2030+2050) needs** for professional profiles and skills, setting out unmet training and educational needs.
3. Support the relevant **upgrade, adaptation and development of bioeconomy-related training and education** to meet future workforce needs for the deployment of a sustainable and circular bioeconomy by developing and considering relevant elements (e.g. modules, curricula, methods and tools but also by looking at the relevant context and structures).
4. Improve **collaboration** between educational institutions and industry, and improve **transfer of science, technology and innovation knowledge** and skills in the bioeconomy.

The study focuses on 10 Member States (BE, BG, EE, FI, DE, IT, LV, NL, SK and ES)

General objectives

- Contribute to the **development of educational and training content, methods, tools and structures** to achieve a **mainstreaming of bioeconomy into education and training**
- Ensure that **bioeconomy figures more prominently in relevant studies** (incl. agricultural, forestry, fisheries, aquaculture, marine and environmental studies, food science and systems, bioengineering and other biobased sector-related studies).
- Provide a **clear picture of bioeconomy relevant higher educational curricula, PhD education, vocational education and trainings and entrepreneurship training** as well as of the **current and future needs for skills and competences** of an evolving bioeconomy, and knowledge of how to close these gaps.

Study steps & key outputs

Study steps

Identify, map and analyse the **current state of art** of the bioeconomy-related:

- university, higher educational and research programmes curricula
- VET programmes
- entrepreneurship training and mindset

Analyse the **immediate human capacity needs for the development of a sustainable and circular bioeconomy** (including core and soft skills (tasks, competences, skills and functions), with a **projection into the future** (2030-2050)

Develop **recommendations** and **model bioeconomy modules** for higher education, VET and entrepreneurship training

Case studies

Policy brief

Model solutions and curricula

Horizon Europe

- **HORIZON-CL6-2021-GOVERNANCE-01-11: Education on the bioeconomy including bio-based sectors for young people in primary and secondary education in Europe**
 - Increased awareness of the environmental, social and economic benefits of sustainable and circular bioeconomy and its sectors
 - Increased interest among new generations to join education and training on sustainable and circular behaviours
 - Preparing the younger generation to assume their role in the transition to a circular and sustainable bioeconomy,

Bioeconomy Youth Ambassador!

The European Commission is looking for Bioeconomy Youth Ambassadors!

- Are you between 18 and 35 years old and have experience or strong interest in [bioeconomy](#)
- Do you want to contribute to the sustainable & circular transition of EU?
- Apply to become a Bioeconomy Youth Ambassador & inspire others about importance of bioeconomy in our life
- More information and application details: [Become a Bioeconomy Youth Ambassador! | European Commission \(europa.eu\)](#)

ARE YOU OUR
NEXT BIOECONOMY
YOUTH AMBASSADOR ?

Apply before 13/06/22 11.59 pm CET



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#EUBioeconomy



Conclusions

- Progress report on EU Bioeconomy strategy adoption in June
- Bioeconomy Education Conference 2nd week of September (final report and policy brief)
- **Bioeconomy Conference in Brussels 6-7 October 2022**

Thank you

The EU's Bioeconomy Strategy:

https://ec.europa.eu/info/research-and-innovation/research-area/environment/bioeconomy/bioeconomy-strategy_en

The Knowledge Centre for Bioeconomy:

https://knowledge4policy.ec.europa.eu/bioeconomy_en

Horizon Europe portal:

<https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/programmes/horizon>

#HorizonEU #EUScience&Innovation #EU_ScienceHub



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