GENB
YOUNG BIOVOICES FOR A SUSTAINABLE FUTURE

D3.4

Position Paper "Our GenB future"

Project Title	GenB
Contract No.	101060501
Instrument	Coordination and Support Actions
Funded under	Cluster 6: Food, Bioeconomy Natural Resources, Agriculture and Environment
Start of Project	1 November 2022
Duration	30 months

OUR CONSORTIUM

APRE Agenzia per la Promozione della Ricerca Europea
btg biomass technology group
LOBA®
PEDAL CONSULTING
European Schoolnet
ZSI
aiju Instituto Tecnológico del Producto Infantil y Ocio
Q-PLAN INTERNATIONAL
FVA NEW MEDIA RESEARCH
Hellenic Society for the Protection of Nature

Funded by the European Union

www.genb-project.eu info@genb-project.eu

Deliverable title	Position Paper "Our GenB future"
Deliverable number	D3.4
Deliverable version	V3.0
Contractual date of delivery	28 February 2025 (M28)
Actual date of delivery	27 February 2025
Deliverable filename	D.3.4_GenB_Position_Paper_ "Our GenB future"
Nature of deliverable	Report
Dissemination level	Public
Number of pages	54
Work Package	WP3
Task(s)	T3.4
Partner responsible	Q-PLAN International Advisors
Author	Dimitra Kyriakopoulou, Maya Gerotziafa, Michail Mitsouridis (Q-PLAN INTERNATIONAL)
Editor	Flavia Fusconi
EC Project Officer	Gaëlle Le Bouler
Abstract	The Position Paper "Our GenB Future" reflects youth perspectives on the bioeconomy, highlighting challenges in education, career pathways, policymaking, and funding. It proposes solutions to enhance bioeconomy education, youth participation, and inclusivity. By integrating these insights, the paper advocates for a sustainable and innovation-driven bioeconomy. Policymakers, educators, and industry leaders are urged to empower youth in shaping this transition.
Keywords	Youth, transition, policy, bioeconomy

Copyright

Peer Reviews

NAME	ORGANISATION
Selenia Marinelli	FVA
Katharina Handler, Juliet Tschank	ZSI
Isidora Salim, Gina Mihai	EUN
John Vos	BTG
Chiara Pocaterra, Flavia Fusconi	APRE

Revision History

VERSION	DATE	REVIEWER	MODIFICATIONS
0.1	11/02/2025	All partners	First version sent to partners for quality review
0.2	21/02/2025	FVA, ZSI, EUN, BTG	Addressing partners' comments
0.3	27/02/2025	APRE	Addressing the coordination team's comments

Table of Contents

Index of Figures

Table of Abbreviations and Acronyms

Abbreviation	Meaning
NGO	Non-Governmental Organisation
SME	Small – Medium Enterprise
STE(A)M	Science, Technology, Engineering, (Arts), Mathematics

Executive Summary

The Position Paper “Our GenB Future” was elaborated in the framework of Task 3.4 “European Youth Forum on bioeconomy” and represents the collective voice of youth on the future of the bioeconomy, gathered through a series of engaging activities from June 2024 to January 2025. The Paper reflects the insights and recommendations of over 480 participants, more than 55% of those under 30 years old. The engaged stakeholders came from a wide range of backgrounds, including young students and professionals, policymakers, industry representatives, youth organisations, educators, and civil society organisations. The participation of young people (ages 4-19) in the events was limited due to the structure and objectives of the discussions. Since the goal was to develop concrete policy recommendations, the content required a certain level of subject knowledge and analytical skills, making it more suitable for older participants. The exclusive use of English as the working language has also posed a challenge for younger individuals, particularly those less familiar with technical terminology. The European Youth Forum activities, comprising of a cross-fertilisation workshop, three Bioeconomy Youth Debates, and an International Bioeconomy Policymaking workshop, provided an opportunity for these diverse voices to converge and shape the dialogue surrounding sustainable resource utilisation. Also, to ensure broad representation and gather diverse perspectives, three online consultation surveys were conducted, allowing individuals to contribute with their opinions asynchronously and maximise participation. In these surveys the respondents were invited to answer the same questions which were posed to the participants of the three Bioeconomy Youth Debates. The outcomes of the debates and the respective surveys were treated accordingly to create this Position Paper. In Annex a. details regarding the number of participants and their demographics are included.

This paper is structured to effectively communicate these youth perspectives.

The discussions highlighted key challenges, such as gaps in bioeconomy education, unclear career pathways, limited youth participation in policymaking, and the need for greater funding and mentorship opportunities. Addressing these issues, the paper puts forward concrete recommendations to:

- Strengthen bioeconomy education through interdisciplinary, experiential learning approaches.
- Enhance youth involvement in policymaking to ensure their voices are heard while shaping future policies.
- Support career development in the bioeconomy with clearer pathways, mentorship, and funding.
- Foster inclusive and accessible participation, ensuring all young people can engage in bioeconomy initiatives.

By integrating youth perspectives into decision-making, policymakers, educators, and industry leaders can empower young people to take an active role in driving the transition to a sustainable, just and inclusive bioeconomy.

1. Introduction

1.1 Scope of the Position Paper

The European Youth Forum activities implemented under GenB T3.4 “European Youth Forum on bioeconomy” aimed to provide opportunities and mechanisms for the young generation to discuss and make their voices heard on the transition to a circular and sustainable bioeconomy.

The bioeconomy, encompassing the sustainable production and utilisation of biological resources, presents both immense opportunities and complex challenges. Navigating this landscape effectively requires a multi-faceted approach, which prioritises inclusivity and empowerment of the next generation to become active drivers of change. This Position Paper showcases the valuable insights, suggestions, and recommendations provided by young people and stakeholders with backgrounds in teaching, academia, policy, and civil society regarding the future of the bioeconomy. It compiles insights gathered through a series of dynamic and engaging activities held during the GenB European Youth Forum -spanning from June 2024 to January 2025-, into an easy-to-use guide for policymakers, highlighting the crucial steps identified by young people for a sustainable, just and inclusive transition.

Through a bottom-up approach, the GenB European Youth Forum activities provided a unique opportunity for diverse voices to converge and contribute to the ongoing dialogue surrounding the bioeconomy. These activities included a cross-fertilisation workshop designed to bridge various youth bioeconomy initiatives, three Bioeconomy Youth Debates, three asynchronous consultation surveys and an international Bioeconomy workshop focused on policymaking. The events’ speakers derived from a wide range of backgrounds, offering diverse perspectives on critical bioeconomy issues: g educators, young advisory boards and youth initiative members, young scientists, bioeconomy think-tank members, and a policy officer. Collectively, these events engaged over 480 European and non-European participants as audience from diverse backgrounds, fostering a rich exchange of ideas and experiences:

- Young students and professionals from various fields, such as environmental sciences, economics, communication, and innovation, all united by their interest in sustainability, the bioeconomy, and policymaking.
- Policy and decision-makers from local, national, and EU institutions involved in shaping bioeconomy-related policies.
- Bioeconomy stakeholders, including industry representatives, startups, organisations operating within bio-based sectors, and researchers and academics focused on sustainable development and innovation.
- Youth organisations and networks actively advocating for youth participation in decision-making and sustainability initiatives.
- Educators and mentors dedicated to guiding young individuals toward fulfilling careers in the bioeconomy.

- Civil society organisations championing environmental justice, inclusion, and sustainable growth.

The participants expressed their views, opinions and suggestions through co-creation tools, primarily using MIRO Board sessions.

By bringing together the thoughts, concerns, and ideas of the young participants, the Position Paper helps turn their perspectives into real action. It **translates discussions into recommendations**, making it easier for decisionmakers, educators, and industry stakeholders to understand and address young people's needs to engage in the bioeconomy.

1.2 Purpose of the Position Paper

The purpose of the Position Paper is to **amplify the voices of young people** in shaping the future of the **bioeconomy** by highlighting their **perspectives, challenges, and suggestions**. It serves as a **strategic document** that:

- **Presents insights** gathered from youth engagement activities, including debates, workshops, consultations and discussions held during the European Youth Forum on Bioeconomy (T3.4 GenB Project).
- **Identifies key challenges** young people face in engaging with and contributing to the bioeconomy.
- **Provides suggestions** to policymakers, educators, and industry stakeholders to improve bioeconomy education, enhance youth participation in decision-making, and create career and entrepreneurial opportunities.
- **Advocates for systemic change** to ensure that the bioeconomy becomes **inclusive and youth-driven**, fostering innovation and sustainability for future generations.

In essence, this Paper aims to **inform and influence policymakers and stakeholders** by demonstrating that young people are **not just beneficiaries but active contributors** to the bioeconomy's development.

The Position Paper can be considered as a "**manifesto"** that keeps the conversation going beyond the workshops and debates. It provides a **common ground for collaboration** between different stakeholders (policymakers, educators, industry, and youth networks, NGOs) and ensures that youth perspectives are part of broader policy dialogues. Additionally, it represents a **long-term resource that supports the sustainability of the GenB project**, serving as a reference point for future initiatives and **ensuring that youth input does not remain unexploited**.

1.3 Reading Guide

In Summary, this Position Paper is organised into **four interrelated chapters**.

It begins with an **Introduction 1**, that briefly outlines the aim of the Position Paper.

Chapter 2, "Key Insights from the European Youth Forum Activities," synthesises the challenges identified by participants, including insufficient education, lack of clear career pathways, misinformation, limited youth involvement in policymaking, and the need for funding and mentorship. It also highlights the overall results of the Forum, showcasing advancements in bioeconomy education, empowerment of young communicators, inspiration through art and culture, promotion of inclusivity, and strengthened youth participation in policymaking.

Building upon these insights, **Chapter 3**, "Position and Recommendations for the Bioeconomy by Youth Perspective," outlines concrete, actionable steps for stakeholders, focusing on empowering youth in policymaking, investing in bioeconomy education and skills development, promoting youth engagement, and ensuring an inclusive and equitable bioeconomy. These recommendations emphasise access and inclusion, curriculum integration, experiential learning, resource facilitation, and support for youth-led initiatives.

Chapter 4, "Overall Youth Position on the Bioeconomy," presents the collective stance of young people on the transition toward a bio-based economy. It stands as a manifesto of youth highlighting their commitment to a sustainable, inclusive, and innovation-driven future while addressing key challenges such as accessibility, education, equitable opportunities, and youth participation in decision-making. The chapter underscores the importance of integrating bioeconomy concepts into education, fostering sustainable entrepreneurship, strengthening connections between science and society, and leveraging arts and culture for sustainability communication.

The **Annexes** provide detailed documentation of the European Youth Forum activities and links on the official GenB website, offering a comprehensive record of the events, their results and their contributions to this Position Paper.

2. Key Insights from the European Youth Forum Activities

2.1 Identified challenges

The transition to a sustainable bioeconomy requires a fundamental shift in the education, engagement, and empowerment of young people. However, several interconnected challenges currently hinder their full involvement and limit their ability to contribute meaningfully. These obstacles range from educational gaps to systemic barriers. Participants in the GenB European Youth Forum activities highlighted numerous challenges in the bioeconomy, including:

Complex nature of bioeconomy**:** The bioeconomy is a **broad and interdisciplinary field** that integrates science, technology, policy, economics, and sustainability. Its complexity can make it challenging for young people to fully grasp, especially due to uncertainties about its true sustainability—such as gaps in data and information on Life Cycle Assessment. Additionally, understanding the bioeconomy **requires knowledge of diverse concepts**, including biotechnology, the circular economy, bio-based industries, and ecosystem services.

Curriculum constraints and insufficient teaching methods: Traditional teaching methods are often inadequate for communicating the complexity of the bioeconomy, as they rely heavily on static learning approaches that fail to engage young people effectively. Unlike traditional subjects that follow structured learning pathways, **bioeconomy is constantly evolving, making it harder to fit** into standard curricula. At the same time, youth today are growing up in an era of screens, rapid applications, and interactive content, making it crucial to rethink how bioeconomy education is delivered. It is not uncommon that teachers lack the necessary knowledge and tools to effectively communicate bioeconomy, often confusing it with broader concepts of sustainability and circular economy. This can lead to overlooking the crucial role of renewable biological resources, which are at the core of bioeconomy processes.

Lack of Clear Career Pathways: Young people. when interested in pursuing bioeconomy careers, they often face difficulties in seeing real examples of viable career opportunities in bioeconomy due to a **lack of clear guidance and visibility of available jobs**. Unlike more traditional career fields, bioeconomy spans multiple sectors—ranging from agriculture and biotechnology to sustainable materials and bioeconomy initiatives—making it difficult for students to understand where they fit in or how to navigate their professional journey. Many young people are **unaware of the diverse roles within the bioeconomy** because career counselling in schools rarely highlights these opportunities, and job descriptions in the sector are often highly specialised. Additionally, **there is a disconnection between education and industry needs**, with bioeconomy-related skills not always aligning with job market demands.

Misinformation and Engagement Challenges: Communicating the bioeconomy effectively can be challenging due to misinformation (e.g. misconceptions that bioeconomy could negatively affect the economy) and difficulties in engaging audiences. Parents often view sustainability and creative activities outside the standard school curriculum as less valuable than traditional subjects, seeing them as time-consuming rather than essential for future skills.

Limited Youth Involvement in Policymaking: Young people are often excluded from policymaking processes, particularly those from marginalised groups (check results of Debate #3). They may be consulted in single events, counselling sessions or advisory panels, but they lack sustained opportunities to engage in decision-making processes in a meaningful way.

Funding and Mentorship Limitations: Young professionals often lack access to funding, mentorship, and other resources needed to succeed in the bioeconomy. Many young people lack awareness of available grants, fellowships, or startup funding, and when opportunities do exist, they are often targeted at established organisations rather than emerging talents. Moreover, bioeconomy-related funding opportunities are often scattered, difficult to access, or require complex application processes that discourage young applicants.

Challenges in Traditional Jobs: The potential of the bioeconomy to address challenges in traditional jobs was explored, with discussions focusing on creating new income streams, green jobs, and improved working conditions across various dimensions (economic, environmental, social, technological, and psychological). Traditional industrial jobs often expose workers to pollutants and hazardous materials, leading to potential health risks and occupational hazards. Furthermore, these jobs can sometimes contribute to environmental degradation and societal problems, potentially leading to decreased job satisfaction and increased workplace stress. The use of harmful chemicals is also prevalent in some traditional farming and manufacturing practices.

Technological Challenges: As stated in the Draghi's Report "The future of European competitiveness", the rapid advancements in clean technologies (e.g., precision agriculture, bioinformatics) pose a challenge for the European Industry which must adapt quickly to remain competitive. Transitioning to the bioeconomy requires significant investment in the market of clean technologies which can trigger the job creation[1] and accelerate the neutral climate target at European and non-European levels. Bioeconomy sectors often focus on grassroots innovation, allowing workers to participate in designing and improving technologies tailored to local contexts.

Apart from challenges, participants of the European Youth Forum activities identified key skills needed in bioeconomy and potential careers. The transition to **bioeconomy requires a workforce with**

[1] By 2030, it is estimated that around five million new jobs will be created in the electric vehicles and the production of their batteries sectors alone. *IEA, Advancing Clean Technology Manufacturing – An Energy Technology Perspectives Special Report, 2024.*

specialised skills that bridge science, business, and technology as well as humanities, arts, culture and policymaking. Transversal skills are as important as technical; thus, a significant **skills gap** has been identified that prevents young people from fully engaging in and contributing to this sector. Developing the following key skills, which were identified by the European Youth Forum participants, is essential to **overcome current challenges** and ensure that the bioeconomy can grow, innovate, and become a driver of sustainable economic transformation.

Skills needed in Bioeconomy that will require further development for youth wishing to occupy themselves with bioeconomy are:

1. Environmental knowledge: A strong understanding of ecosystems, sustainability principles, and resource management is crucial in the bioeconomy. Professionals need to grasp **how biological resources are produced, used, and regenerated sustainably**, ensuring minimal environmental impact.

2. Creativity and Innovation: Bioeconomy thrives on new ideas and alternative materials, so innovative solutions to replace fossil-based products are considered vital. Creativity is essential when designing bio-based alternatives. Innovative, critical and systems thinking along with entrepreneurial skills also have been identified as crucial.

3. Analytical skills: Analytical skills help in understanding data, interpreting trends, and making informed decisions. These skills are needed also when **evaluating the impact of bio-based processes**, assessing life cycle sustainability, and conducting research to improve bioeconomy solutions.

4. Technical skills: Business perception. Given that bioeconomy is a fast-evolving sector requiring expertise in biotechnology, bioengineering, agri-tech, and industrial processes, professionals must understand how bio-based products are developed and manufactured, as well as the business models behind them. Knowledge of supply chains, value chains, and market positioning is crucial for **bringing bio-based solutions to market successfully**.

5. Management and Communication skills: **Management skills** help in organizing, planning, and executing bioeconomy projects efficiently. **Communication skills** are equally important for explaining bioeconomy concepts to diverse audiences, raising awareness, and promoting public acceptance of innovative solutions.

6. Legal skills: Understanding and navigating regulations, (such as the European Green Deal, the Bioeconomy Strategy, and circular economy legislation, regional plans for bioeconomy etc) is essential for compliance and advocacy. This knowledge helps businesses and researchers **develop solutions that align with legal frameworks** and contribute to policy development.

7. Risk management and Digital skills: New materials or industrial processes may evoke risks. Managing risks in the bioeconomy involves assessing **environmental, financial, and technological**

uncertainties related to bio-based production. When it comes down to digital skills, youth understand that they are becoming increasingly important in monitoring bioeconomy developments and optimizing production processes.

Developing these skills can unlock diverse career opportunities across multiple sectors. By aligning these skills with diverse career paths, young future professionals can find meaningful opportunities to contribute to bioeconomy, whether through scientific research, industrial innovation, creative expression, or strategic consulting. The growing demand for bio-based solutions highlights the need for a workforce capable of thinking holistically (system thinking), collaborating across sectors, and driving sustainable change.

2.2 Overall results

The overall results of the GenB European Youth Forum events offered several key achievements and advancements. A clearer vision for effective bioeconomy education emerged, emphasising a holistic, interdisciplinary approach, practical hands-on learning, and strong partnerships between educational institutions, organizations, and the private sector. Strategies for parental engagement and innovative teaching approaches should focus on designing curricula that promote a comprehensive understanding of the bioeconomy's complexity. Additionally, innovative funding mechanisms were identified as essential.

The potential of **young communicators to advocate** for the bioeconomy was recognised, with a focus on leveraging digital platforms, developing critical thinking and fact-checking skills, and engaging communities through relatable initiatives and positive messaging.

The power of **art and culture to connect young people with the bioeconomy** on a personal level was highlighted. The use of natural materials, bio-inspired design, and creative spaces like makerspaces was identified as effective tools for fostering engagement, and inclusion of marginalised groups through arts-based experiential approaches to meet different learning needs while promoting sustainability principles.

The importance of **inclusivity and equity in the bioeconomy** was underscored, with a focus on the roles of various stakeholders in empowering marginalised communities. Capacity-building activities, particularly non-formal educational training, inclusive policies, and targeted training programs were identified as crucial for ensuring equitable benefit-sharing.

Strategies for **strengthening youth participation in policymaking** were identified, including integrating youth into decision-making processes, improving civics education, and fostering practical workshops. The need for stronger partnerships between educational institutions and policymakers was also recognised.

In essence, the events generated a wealth of insights and actionable recommendations for advancing bioeconomy education, empowering young communicators and artists, promoting inclusivity,

addressing job challenges, and strengthening youth participation in policymaking. These outcomes provide a strong foundation for building a sustainable and equitable bioeconomy.

1. Position and Recommendations for the Bioeconomy from Youth's Perspective

The bioeconomy represents not only an essential pathway toward sustainable development but also an opportunity to reshape the citizens' approach in relation with the environment and technology. This section outlines the collective vision and recommendations from the participants of the GenB European Youth Forum activities, who are willing to contribute to building a sustainable future. From education to policymaking, the European Youth Forum participants' perspective emphasises innovation, inclusion, and fairness. These recommendations reflect their desire to engage meaningfully with the bioeconomy, ensuring that it is both accessible and beneficial for all, especially underrepresented groups. The following positions and proposals underscore the commitment to creating a bioeconomy that is forward-thinking, inclusive, and aligned with the values of the young generations.

Invest in Bioeconomy Education, Continuous Learning and Skills Development

Curriculum Integration: **Integrate bioeconomy concepts across various subjects in school curricula**, to broaden understanding, even before primary education until university level and beyond. This should include topics such as sustainable resource management, climate change, controversial issues related to the bioeconomy (e.g. greenwashing), difference between circular economy and bioeconomy. To effectively equip educators to teach bioeconomy, a comprehensive approach is required, encompassing dedicated training activities and readily implementable toolkits for classroom use. This should be complemented by robust teacher education programs focused on environmental matters, ensuring educators possess the necessary knowledge and understanding. Furthermore, fostering cooperation with organizations and institutes that possess relevant tools, and expertise will provide educators with access to valuable resources and support.

Experiential Learning: **Prioritise experiential and interactive learning approaches**, such as outdoor education, hands-on activities, and project-based learning, to foster a deeper understanding of bioeconomy principles. Creating easily digestible content (e.g., videos, infographics) explaining bioeconomy concepts to make learning more accessible and engaging, while promoting active, student-centred learning models seems crucial. At the same time, it is fundamental to invest in intergenerational learning, as older generations have long applied core bioeconomy values such as sustainability and resource efficiency. By sharing their knowledge, skills, and experiences, they can help younger generations adopt sustainable practices, improve resource management, and advance bio-based innovation.

Skills Development: Support the **development of essential skills** for the bioeconomy, including environmental knowledge, creativity and innovation, analytical, technical and communication skills, transversal skills, digital literacy, risk management and business perception, and legislation and

regulation knowledge. Also, it is identified as crucial that people, especially at younger ages should learn practical green skills e.g. to learn how to fabricate things from scratch using bio-based materials and understand the resource value. **Capacity-building**, training programmes and educational campaigns for bioeconomy sectors like renewable energy or sustainable agriculture should be prioritised.

Career Pathways: Provide clear career pathways in the bioeconomy through internships, apprenticeships, mentorship programs, and targeted training initiatives. The suggested careers in different domains are:

- Research and Development: Bioprocess researchers, Environmental Policy analysts, Land-use planners
- Engineering: Biorefinery plant managers, Bioenergy technicians, Bio-based materials manufacturers, Bioprocess operations optimisation
- Humanities and Arts: Bio-fashion designers, Bio-architects/designers, Game creators, Landscape designer, Historical skills coordinator
- Business and economics: New business models, new value chains, revitalisations of rural and coastal areas to strength resilience and enhance inclusivity.
- Awareness: Sustainability communicators, Ecosystem facilitators, Sustainable tourism, Connector of stakeholders along the value chain

How European Youth Forum participants perceived starting a new career in bioeconomy can be outlined in the roadmap they developed in the framework of Debate #1: Bioeconomy Education and training to develop the skills of the future (see Figure 1). The roadmap outlines four key steps:

I. first understand personal passions and competencies in exploring career options in the bioeconomy,
II. investigate available roles and the competencies required to ensure a well-informed career path
III. build networks and connection with professionals, join communities, and participate in events to gain valuable insights and mentorship and
IV. gain practical experience through internships and volunteering to develop essential skills and increase employability in the sector.

Figure 1: Career planning

Promote Youth Engagement in the Bioeconomy

Facilitate Access to Resources: Provide access to funding, mentorship, and networking opportunities for young people developing bioeconomy projects or starting bio-based businesses. Also, through legal and administrative training, young people would be empowered to effectively access public grants and subsidies, enabling them to launch and scale their bioeconomy initiatives.

Support Youth-Led Initiatives: To effectively support youth-led initiatives, a multi-pronged approach is recommended. First, develop a compelling value proposition that resonates with young people, clearly articulating the benefits and impact of their involvement. Crucially, engagement efforts should meet young people where they are, rather than expecting them to conform to traditional meeting formats; this means actively participating in spaces and platforms frequented by youth. Creating dedicated spaces for youth involvement in shared projects and initiatives ("the commons") is also essential. Furthermore, providing greater visibility to the ideas and contributions of young people within institutional contexts will demonstrate their value and inspire others. Direct dialogue opportunities with established authorities should be facilitated, allowing young people to voice their perspectives and engage in meaningful exchanges. Highlighting the success stories of young changemakers will further motivate and empower others to take action. Finally, fostering intergenerational collaboration through workshops that bring together young people and experienced leaders, like the model used by European Rural Parliament NGOs, will facilitate knowledge transfer and mutual learning.

Harnessing Arts and Culture for Sustainable Communication: Artistic expression plays a crucial role in making sustainability more tangible and engaging, transforming complex environmental issues into

accessible and inspiring narratives. Hands-on artistic experimentation, such as using natural pigments, biobased materials, and eco-conscious design, could become useful tools for material activism, encouraging communities and even more effectively early childhood learners and marginalised groups to engage with bioeconomy. Storytelling through theatre, music, podcasts, and visual arts are also suggested ways to communicate sustainability challenges and solutions, moving beyond traditional data-driven approaches. Performances, exhibitions, and digital media could be used as frameworks for amplifying sustainability messages, thus addressing the misinformation and audience engagement barriers. Exploring the integration of arts into sustainability education can enhance learning, particularly through STE(A)M approaches that blend artistic creativity with scientific knowledge. Examples include bio-inspired fashion, immersive sustainability exhibitions, and participatory art installations.

Ensure an Inclusive and Equitable Bioeconomy

Promote Equity and Fairness: Implement policies that promote equity and fairness in the bioeconomy, ensuring that its benefits are shared widely and not solely with the industrial sector. SMEs and NGOs could help marginalised communities (e.g., ethnic and racial minorities, low-income populations, refugees and asylum-seekers, persons with disabilities, migrant workers, unemployed youth) develop digital literacy skills to better engage with technology across various bioeconomy sectors. This includes projects, but is not limited to, sustainable agriculture, biowaste management, and bio-based innovation, with a focus on projects that empower these communities to actively participate in and benefit from the transition to a sustainable bioeconomy. Moreover, facilitate microfinance opportunities or act as intermediaries to secure funding for small-scale bioeconomy projects and leverage international networks to share good practices and provide them access to markets for bio-based products.

Policies could also prioritise hiring from local communities, especially underrepresented groups, for bio-based ventures, develop partnerships with marginalised communities, integrating them into the supply chain (e.g., sourcing materials from smallholder farmers and supporting bio-based products made by marginalised artisans). It was also stressed out the need to strengthen rural economies by reducing job migration, rural depopulation, and unemployment by valorising the market of local natural resources and boosting local jobs such as eco-tourism, biobased crafts etc. Governments should integrate enhanced labour standards into bioeconomy policies, ensuring fair wages, safe working conditions, and rights for workers involved in green jobs.

Support Community-Based Initiatives: Encourage and support place-based bioeconomy initiatives that empower local communities, create sustainable livelihoods, and promote social inclusion. Educate marginalised groups about bioeconomy opportunities and their rights to engage in decision-making processes, organise language-sensitive community workshops to explain bioeconomy, adopt art-based approaches to meet different learning styles and needs while fostering a more inclusive and engaging environment, involve underrepresented groups (e.g., women, refugees, ethnic minorities) in the design and implementation of bioeconomy initiatives (make them speakers/ live examples etc.).

Empower Youth in Policy Making

Access and Inclusion: Ensure young people have access to policymaking processes and are meaningfully included in decision-making that impacts their future. This includes creating youth advisory boards and dedicated spaces for youth input in policy development. Regulations and bureaucratic processes need to be simplified, coupled with active support from policymakers to encourage youth involvement. Furthermore, youth-specific regulatory task force should be established to specifically identify and address the key bureaucratic barriers faced by young entrepreneurs and innovators in the bioeconomy. Facilitating access to policymaking processes through dedicated facilitators and enablers is crucial, as is actively building bridges between youth and policymakers through networking events and mentorship programs. A user-friendly guide or toolkit should be developed to help young people navigate the regulatory landscape more easily.

Representation and Voice: Increase youth representation in formal policymaking bodies and support the development of youth-led organisations and initiatives that amplify young voices in policy discussions. Provide platforms for young people to share their perspectives, ideas, and success stories related to the bioeconomy, such as the European Bioeconomy Stakeholder Platform[2], highlighting their contributions and inspiring others. Such platforms within Europe could be the EU Youth Dialogue where the Commission seeks the input of over 50,000 young people on a range of policy areas, the Youth portal, Erasmus+ and Erasmus for young entrepreneurs. It is valuable both to develop and promote these platforms to the general public and to establish new ones.

Young people are key stakeholders in the transition to a sustainable bioeconomy, as they will shape its future across economic, political, and social domains. Policies should prioritise their empowerment, education, and engagement to ensure that they have the knowledge, skills, and opportunities to contribute to and benefit from the bioeconomy.

[2] https://research-and-innovation.ec.europa.eu/news/all-research-and-innovation-news/new-report-and-policy-brief-increasing-stakeholder-engagement-eu-bioeconomy-policy-2024-12-11_en

The identified key ideas for spreading awareness and changing perceptions according to the Bioeconomy Youth Forum participants are illustrated in the figure below:

Figure 2: Awareness Ideas

3. Overall Youth Position on the Bioeconomy

The bioeconomy represents a transformative pathway toward a more sustainable, just, and innovative future and adopts a cross-sectorial approach. The achievement of bioeconomy goals cannot rely on a single economic sector; instead, it requires a fundamental shift in how Europe produces, consumes, and interacts with the environment. Young people recognise the urgency of transitioning to a bio-based economy and are eager to contribute their energy, creativity, and vision to shape it. Their position is clear: the bioeconomy must be inclusive, accessible, and sustainable, ensuring that it benefits all individuals and communities while safeguarding the planet.

A Bioeconomy for the Future: Youth's Core Commitments

The following compose a briefing of positions in the form of a youth manifesto.

1. Education and Skills Development for a Thriving Bioeconomy: Education is the foundation of a strong bioeconomy. Youth call for the integration of bioeconomy concepts across all levels of education, from primary schools to lifelong learning programs. This includes interdisciplinary approaches that connect science, technology, business, and social innovation. Hands-on experiences, project-based learning, art-based approaches and intergenerational knowledge exchange must be prioritised to ensure young people gain the skills necessary to lead in bio-based industries.

2. Equitable Opportunities for All: Bioeconomy should be inclusive and provide opportunities for all individuals, regardless of socioeconomic status, gender, or geographic location. Special attention must be given to rural and coastal communities, underrepresented groups, and marginalised populations to ensure fair participation. Young people emphasise the importance of equitable access to education, jobs, funding, and leadership roles within the bioeconomy.

3. Youth Empowerment and Participation in Decision-Making: Young people need to have a seat at the table when shaping policies and strategies for the bioeconomy. Governments, institutions, and industry leaders should actively engage youth in policymaking processes, ensuring that their voices are heard, and their contributions are valued. Creating dedicated youth advisory boards, simplifying bureaucratic procedures, and fostering mentorship programs will strengthen youth participation in shaping a sustainable bioeconomy.

4. Sustainable Innovation and Entrepreneurship: Bioeconomy is linked to sustainable innovation so to be successfully implemented young entrepreneurs should be provided with access to funding, resources, and networks. Support structures such as incubators, accelerators, and collaborative platforms should be expanded to help youth develop bio-based solutions that address global challenges like climate change, resource scarcity, and waste management. Legal frameworks should be adopted to support youth-led initiatives, making it easier for young entrepreneurs to enter and thrive in the bioeconomy.

5. A Circular and Regenerative Mindset: A truly sustainable bioeconomy requires a shift in mindset—from a linear take-make-dispose economy to a circular, regenerative model. Young people advocate for policies and incentives that promote resource efficiency, waste reduction, and the responsible use of biological resources. Educational programs, community initiatives, and industry practices must align with -bioeconomy principles, fostering a culture of sustainability from an early age.

6. Arts and culture as mean of sustainability communication: The role of arts and culture in sustainability communication, along with the power of creative expression in making complex environmental issues more simple, accessible and engaging, is highly significant. Integrating art into sustainability narratives can foster emotional connections, inspire behavioural change, and drive collective action. These approaches demonstrate the potential of arts-driven communication to reshape public perceptions and mobilise action toward sustainability.

7. Ethical and Fair Bioeconomy Practices: A bioeconomy that prioritises ethical considerations, fairness, and responsible innovation is essential for long-term success. The youth demand policies that prevent monopolization by large corporations and instead support community-based and small-scale bioeconomy initiatives. Transparent governance, fair labour standards, and respect for biodiversity and local knowledge must be at the core of bioeconomy strategies.

A Call to Action: The youth of Europe and beyond are ready to take action and contribute to building a bioeconomy that aligns with their vision of a sustainable, inclusive, and innovation-driven future. However, this cannot be achieved without structural support, investment, and meaningful engagement from policymakers, educational institutions, industries, and society.

The transition to a bioeconomy is not a choice but a necessity, and young people stand committed to leading this transformation. It is time to work together—across generations, sectors, and borders—to ensure that the bioeconomy serves the needs of future generations and the planet.

4. Annexes – Further Reading

a. European Youth Forum Activities statistics and demographics

European Youth Forum Activity	Number of participants	Age Range	Gender Balance
Cross Fertilization workshop (18/06/2024)	45	14-17: 4.2% 18-24: 20.8% 25-30: 37.5% 31+: 37.5%	Females: 32% Males: 14% Non-binary: 4.2%
Debate #1	55	<13: 2% 18-24: 16% 25-30: 37% 31+: 45%	Females: 69% Males: 31%
Debate #2	67		
Debate #3	91		
Online Consultation Survey #1	46	<13: 2% 14-17: 5% 18-24: 9% 25-30: 35% 31+: 49%	Females: 74% Males: 26%
Online Consultation Survey #2	30	14-17: 8% 18-24: 4% 25-30: 46% 31+: 42%	Females: 54% Males: 46%
Online Consultation Survey #3	28	14-17: 8% 18-24: 4% 25-30: 54% 31+: 34%	Females: 63% Males: 38%
International Bioeconomy workshop “Youth2Policy for our GenB Future”	131	<13: 1% 14-17: 2% 18-24: 24% 25-30: 31% 31+: 42%	Females: 64% Males: 35%

b. Cross Fertilization Workshop for Green Youth Networks

The Cross Fertilization Workshop took place online on Tuesday, June 18th. Visit the GenB website to access more information the Cross Fertilization Workshop along with the event's Agenda.

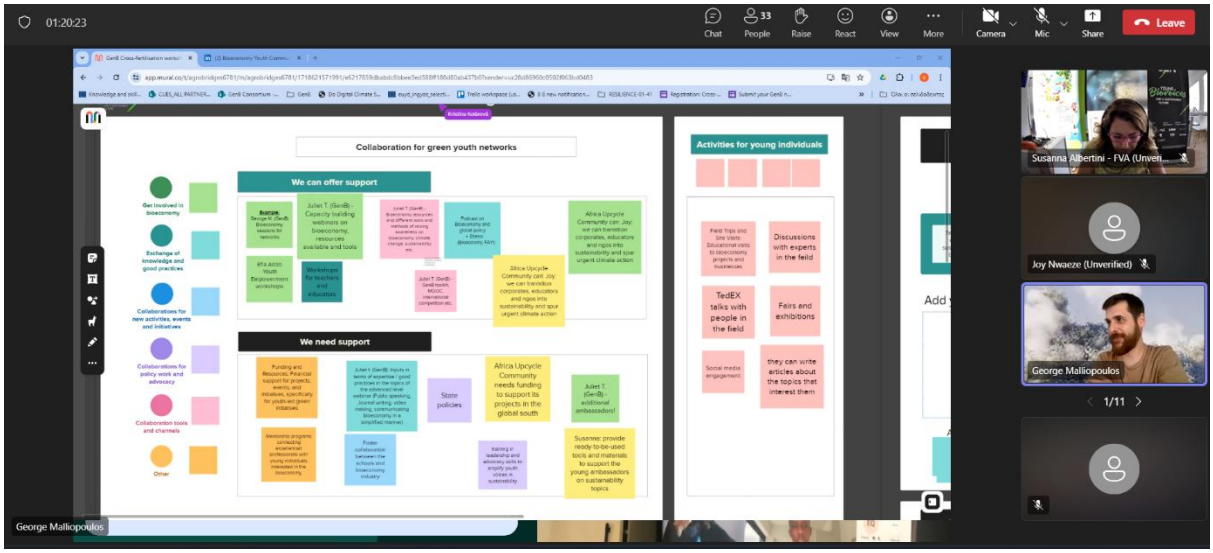

Figure 3: Photo from the Cross-Fertilization Workshop

c. GenB Bioeconomy Youth Debates and online consultation surveys results

You may access the relevant links for each debate by following the links as provided below:

Activity	Link to Agenda	Link to Results
Debate #1: Bioeconomy education and training to develop the skills of the future (4/11/2024)	https://genb-project.eu/app/uploads/2024/10/Agenda-1_v2.pdf	https://genb-project.eu/app/uploads/2025/01/debate-1-results.pdf
Debate #2: Communicating the sustainability vision with the bioeconomy (11/11/2024)	https://genb-project.eu/app/uploads/2024/10/Agenda-2.pdf	https://genb-project.eu/app/uploads/2025/01/debate-2-results.pdf
Debate #3: The youth leading the sustainable transition through bioeconomy (18/11/2024)	https://genb-project.eu/app/uploads/2024/11/Agenda-3-1.pdf	https://genb-project.eu/app/uploads/2025/01/debate-3-results.pdf

1. Online consultation survey results for Bioeconomy Youth Debate #1

Questions	Participants answers
	1. Foundations of Bioeconomy • Definition, principles, and scope of bioeconomy • Role in sustainable development and the circular economy • System thinking and circular economy principles • Bioeconomy's contribution to the Sustainable Development Goals (SDGs) **2. Biological Resources & Sustainable Management** • Types of bio-based resources (forestry, agriculture, marine, waste, etc.) • Biomass utilisation and sustainable resource management • Circular economy principles in biomass use • Responsible production and consumption practices

1. What are the most important subjects or elements to teach about bioeconomy?	**3. Environmental Sustainability & Climate Impact** • Life Cycle Assessment (LCA) and biodegradation • Evaluation of environmental impact from production to disposal • Climate change mitigation and carbon footprint reduction • Conservation of biodiversity and ecosystems • Waste valorisation and resource efficiency **4. Innovation & Technological Development** • Biotechnologies, bio-based materials, and bioenergy production • Role of biorefineries and bioengineering in sustainable solutions • Innovation in bioplastics, biomaterials, and sustainable packaging • Future possibilities in biotechnology and new bio-based products **5. Economic & Business Aspects** • Market trends, value chains, and business models in bioeconomy • New business opportunities and entrepreneurship in bio-based industries • Contribution of bioeconomy to local and global economies • Economic value of biomass and its applications **6. Policy, Ethics & Societal Considerations** • International and EU policies (Green Deal, Circular Economy Action Plan) • Ethical considerations in biotechnology and resource use • Stakeholder engagement and societal acceptance of bioeconomy • Fair and inclusive bioeconomy, ensuring benefits for all communities **7. Practical Applications & Career Pathways**

	• Hands-on experiments (biofuel production, composting, fermentation) • Case studies of bio-based industries and real-world bioeconomy projects • Career opportunities and early education on bioeconomy professions • Entrepreneurship and innovation in bioeconomy-related fields **8. Education, Awareness & Cultural Integration** • Importance of integrating bioeconomy into all levels of education • Experiential and interdisciplinary learning approaches • Role of arts and culture in sustainability communication • Raising awareness about responsible consumption and behavioural change
2. How important do you find the following solutions to introduce life cycle and systems thinking at younger ages?	**Outdoor education (visits at agricultural sites, sanctuaries etc.)** Extremely important: 38.9% Very important: 52.8% Moderately important: 8.3% **Hands-on-practice (e.g. gardening, lab experiments)** Extremely important: 61.1% Very important: 27.8% Moderately important: 11.1% **Experiential teaching (e.g. games, movies, books)** Extremely important: 44.4% Very important: 41.7% Moderately important: 13.9% **Inter-generational learning (e.g. storytelling)** Extremely important: 25% Very important: 44.4% Moderately important: 25% Slightly important: 5.6%

3. Suggestions to overcome the following barriers and challenges to teaching bioeconomy: 1. **Lack of teacher training and awareness** 2. **Funding limitations** 3. **Curriculum constrains** 4. **Rapid scientific/technological advancements**	**1. Lack of Teacher Training and Awareness** • **Professional Development Programs**: Implement workshops, webinars, and summer schools focused on bioeconomy concepts. • **Collaboration with Experts**: Partner with universities, industry professionals, and research institutions to provide educators with the latest developments. • **Mentorship and Peer Learning**: Encourage experienced teachers to mentor others, share lesson plans, and co-teach bioeconomy topics. • **Open-Access Educational Materials**: Develop easy-to-use teaching resources, such as lesson plans, online modules, case studies, and digital tools. • **Continuous Learning**: Encourage teachers to stay updated through online courses, podcasts, and science news platforms. • **Practical Learning Exposure**: Provide hands-on training opportunities, including site visits to biorefineries, research labs, and bio-based industries. **2. Funding Limitations** • **Government & EU Grants**: Encourage schools to apply for funding from programs such as Horizon Europe or sustainability-related initiatives. • **Public-Private Partnerships**: Seek sponsorships from bioeconomy-related businesses to support educational initiatives. • **Crowdfunding & Community Support**: Explore crowdfunding platforms and local initiatives to raise funds for projects. • **Cost-Effective Educational Solutions**: Utilise open-access digital resources, free online courses, and low-cost hands-on learning approaches. • **Industry Sponsorship & Investment**: Engage businesses in funding teacher training and bioeconomy awareness campaigns. • **Regional Living Labs & Shared Resources**: Establish bioeconomy learning centres in

5. (Parental) misunderstandings	collaboration with universities, farms, or science institutions. **3. Curriculum Constraints** • **Integration into Existing Subjects**: Embed bioeconomy topics into biology, chemistry, geography, economics, and environmental science rather than creating separate courses. • **Flexible Learning Modules**: Develop supplementary "bioeconomy weeks" or enrichment activities that fit into existing curricula. • **Project-Based Learning**: Introduce real-world problem-solving challenges to make bioeconomy concepts more tangible. • **Interdisciplinary Approach**: Encourage cross-disciplinary teaching, connecting science, technology, economics, and policy aspects of bioeconomy. • **Policy Advocacy**: Engage with national and local policymakers to highlight the importance of bioeconomy education and advocate for systemic curriculum reforms. • **Real-World Case Studies**: Maintain a dynamic repository of updated case studies, infographics, and multimedia tools. **4. Rapid Scientific & Technological Advancements** • **Continuous Curriculum Updates**: Regularly revise teaching materials to include the latest advancements in biotechnology, bioenergy, and sustainable practices. • **Industry & Research Collaborations**: Create information exchange programs between schools, researchers, and bio-based companies. • **Guest Lectures & Expert Panels**: Invite scientists, policymakers, and industry leaders to share insights on current developments. • **Digital Learning Platforms**: Use online repositories, interactive simulations, and virtual labs to keep pace with advancements.

	• **Encourage Critical Thinking**: Equip students with skills to evaluate new technologies, rather than just memorizing facts. **5. (Parental) Misunderstandings** • **Parent Engagement Sessions**: Organise workshops, open days, and informational events to introduce bioeconomy concepts to families. • **Interactive Learning Activities**: Encourage students to bring bioeconomy topics home through projects, presentations, and discussions. • **Creative Approaches**: Use arts and culture (stories, films, paintings) to communicate bioeconomy in an engaging way. • **Showcasing Real-World Benefits**: Highlight success stories of bio-based solutions that positively impact society and the environment. • **Clear Communication & Transparency**: Develop accessible, science-backed materials to address misconceptions and ensure parents understand the importance of bioeconomy education. • **Family Participation Initiatives**: Organise family-friendly activities like “bioeconomy play days” where parents and children learn together.
4. Which of the following careers in bioeconomy you find the most attractive?	Bioengineer: 17% Sustainability consultant: 17% Bioeconomy communicator: 15% Bio-architect: 15% Agricultural scientist: 12% Environmental Policy Analyst: 12% Food scientist: 10% Historical skills coordinator: 3%

5. How would you plan your career in bioeconomy?	**1. Education & Skill Development** • Choose a relevant educational path (e.g., Environmental Management, Sustainable Agriculture, Circular Economy, Biotechnology). • Gain technical skills such as laboratory techniques, life cycle analysis, GIS for resource mapping, and bioinformatics. • Engage in continuous learning through online courses, books, and seminars. • Consider advanced studies (master's or PhD) in bioeconomy-related fields. **2. Practical Experience & Hands-On Learning** • Participate in internships, volunteer programs, and research projects. • Apply knowledge through hands-on training in biorefineries, sustainable agriculture, or bioenergy industries. • "Learning by doing" gain real-world experience to reinforce theoretical knowledge. • Join summer schools, study tours, and workshops focused on bioeconomy. **3. Career Pathway Exploration & Specialization** • Identify a specialized area of interest (e.g., biotechnology, sustainable design, bio-based entrepreneurship). • Work in R&D to contribute to new bio-based products and solutions. • Explore opportunities in consulting, policymaking, or industry communication.

	• Focus on designing regenerative, nature-centred spaces that align with sustainability goals. **4. Networking & Industry Engagement** • Attend conferences, seminars, and networking events to connect with industry professionals. • Build relationships with bioeconomy organizations, companies, and policymakers. • Engage in peer-to-peer knowledge exchange and mentorship programs. • Stay informed about the latest bioeconomy trends through research collaborations. **5. Entrepreneurship & Innovation** • Develop entrepreneurial skills to create innovative bio-based solutions. • Gain business knowledge related to the bioeconomy sector. • Understand market trends and industry needs to identify career opportunities. • Leverage global opportunities by exploring international collaborations. **6. Overcoming Barriers & General Advice** • Recognise that teachers and parents may struggle with bioeconomy awareness, and structured training is necessary. • Advocate for government-organised seminars and funding to support bioeconomy education. • Stay adaptable and embrace lifelong learning to keep up with rapid advancements.

	• Consider careers that contribute to policy and advocacy for a sustainable future.

2. Online consultation survey results for Bioeconomy Youth Debate #2

Questions	Participants answers
1. How could we use community resources (e.g., educational and youth communities, citizens) to spread awareness and change perceptions in environmental efforts?	**1. Educational Institutions & Curriculum Integration** • Introduce sustainability and bioeconomy topics in school curricula. • Establish bioeconomy clubs and student-led initiatives. • Conduct university-led research on local environmental challenges. • Organise science fairs, competitions, and hands-on sustainability activities. **2. Youth Empowerment & Advocacy** • Engage young influencers and digital creators to promote sustainability. • Encourage peer-to-peer education through student-led workshops. • Support youth-driven campaigns, protests, and awareness initiatives (e.g., Fridays for Future). **3. Community Engagement & Local Initiatives** • Create community gardens and urban farming projects. • Organise neighbourhood-based bioeconomy workshops. • Encourage community involvement in local research and environmental initiatives. • Partner with local stakeholders to drive sustainability programs. **4. Workshops & Hands-On Learning**

	• Conduct hands-on sustainability workshops in schools and communities. • Organise citizen science projects where people can monitor environmental issues. • Provide maker spaces where youth can experiment with bio-based materials. **5. Digital & Media Awareness** • Use social media campaigns and storytelling to spread awareness. • Launch educational digital platforms for sharing sustainability resources. • Collaborate with media outlets and influencers to normalise sustainable behaviours. **6. Policy & Institutional Collaboration** • Engage policymakers in youth-led discussions and sustainability forums. • Provide clear, accessible information to the public about environmental impacts. • Encourage partnerships between businesses, universities, and local governments. **7. Economic Incentives & Practical Actions** • Introduce rewards (e.g., discounts) for eco-friendly actions like recycling. • Provide certification programs for sustainability efforts in schools and workplaces. • Promote practical learning experiences that connect sustainability to daily life.
	1. Deeper Material Awareness • **Material Transparency in Fashion:** Brands like Patagonia and Eileen Fisher disclose fiber types (e.g., organic cotton, recycled polyester) and sourcing methods. • **Bio-based Plastics:** Companies like Avantium create plant-based plastics to replace petroleum-based alternatives.

2. Can you give some examples of these categories: 1. **Deeper material awareness** 2. **Understanding degradation and end-of-life** 3. **Value of re-usability** 4. **Circular Design Thinking** **so that we can we better understand product life cycles and reduce waste?**	• **Sustainable Packaging Alternatives:** Mycelium (mushroom-based) or seaweed-based plastics as replacements for single-use plastics. • **Eco-friendly Building Materials:** Cross-laminated timber (CLT) as a renewable alternative to concrete and steel. • **Comparing Material Impact:** Understanding the trade-offs between materials like bioplastics, glass, and aluminum based on life cycle analysis. **2. Understanding Degradation & End-of-Life** • **Compostable Packaging:** NatureFlex produces cellulose-based packaging that decomposes in home compost systems. • **E-waste Recycling Programs:** Apple and Dell recover valuable materials from old devices. • **Biodegradable Sneakers:** Brands like Allbirds use wool and sugarcane for shoes that break down naturally. • **Take-Back Schemes:** IKEA allows customers to return old furniture for reuse or recycling. • **Composting vs. Landfills:** PLA bioplastics require industrial composting, whereas traditional plastics persist in landfills. **3. Value of Re-usability** • **Reusable Packaging:** Loop by TerraCycle provides refillable containers for everyday products. • **Modular Electronics:** The Framework Laptop allows users to replace or upgrade parts instead of discarding the entire device.

	• **Refillable Cosmetics:** Lush and Kjaer Weis promote reusable beauty product containers. • **Upcycling Initiatives:** Rothy's transforms recycled plastic bottles into shoes and bags. • **Consumer Incentives:** Brands offer discounts for returning used containers for cleaning and reuse. **4. Circular Design Thinking** • **Cradle-to-Cradle Design:** Herman Miller's office chairs are fully recyclable at the end of their lifecycle. • **Closed-Loop Textile Recycling:** H&M and Levi's break down old garments into new fibers. • **Product-as-a-Service Models:** Philips Lighting offers lighting-as-a-service, retaining ownership of materials for reuse. • **Zero-Waste Grocery Stores:** Customers use reusable containers to minimize packaging waste. • **Fairphone's Modular Components:** Phones designed to be repaired and upgraded, reducing electronic waste.
	1. Educational & Awareness Campaigns • Green Schools Network: A program to integrate sustainability into education with hands-on learning and environmental projects. • Earth Hour Ambassadors: A global initiative encouraging people to turn off lights for an hour to raise awareness about energy consumption. • Sustainability Podcasts: Creating digital content to spread awareness about bioeconomy, circular economy, and green practices.

3. What programmes, events, initiatives would you join or create to be a sustainability ambassador?	• Eco Film Festivals: Screening documentaries about environmental challenges and solutions to engage wider audiences. • Zero Waste Month Challenge: Encouraging students to reduce waste for a month as a learning experience. **2. Circular Economy Initiatives** • Community Recycle and Reuse Hub: A local initiative for collecting, recycling, and upcycling materials, with workshops on reusing products. • Global Recycling Day: A global campaign to highlight the importance of recycling and promote sustainable waste management. • Circular Economy Summits: Conferences bringing together policymakers, businesses, and environmental activists to discuss waste reduction. • Clothing Swap & Upcycling Events: Hosting events where people can exchange clothes or transform old garments into new items. **3. Youth & Advocacy Initiatives** • Youth for Climate Action Movement: A youth-led organization that provides resources and organizes advocacy campaigns for climate action. • Fridays for Future: A global school strike movement started by Greta Thunberg, urging stronger environmental policies. • European Climate Pact Ambassador: A program that enables individuals to advocate for climate action at local and EU levels. • UNEP Young Champions of the Earth: A global initiative recognizing young leaders who drive sustainability solutions. **4. Renewable Energy & Green Technology** • Solar Schools Initiative: A program to install solar panels in schools while educating students about renewable energy.

	• EU Sustainable Energy Week: An event focused on energy efficiency and green innovation at the European level. • Horizon Europe Research Projects: Participating in sustainability and renewable energy-focused research initiatives.
4. How natural materials that are used in art (e.g., painting, visual & digital arts, sculpture & installation, fashion & textile, architecture etc.) can help us rethink the environmental impact?	**1. Painting & Visual Arts** • Natural Pigments & Dyes: Artists use mineral-based, plant-derived, and insect-based pigments (e.g., ochre, indigo, turmeric) instead of synthetic, petroleum-based colours. • Eco-Friendly Canvases: Sustainable materials like hemp, bamboo, or recycled textiles help reduce environmental footprints. • Digital Arts & Multimedia: Augmented reality (AR) and virtual reality (VR) offer immersive, waste-free artistic experiences. **2. Sculpture & Installation Art** • Recycled & Found Materials: Artists transform waste into powerful environmental messages, such as sculptures made from ocean plastic or discarded textiles. • Biodegradable Materials: Mycelium (fungus-based materials), algae-based resins, and natural clay decompose without harming ecosystems. • Interactive Art & Public Installations: Artworks that decay naturally over time mirror nature's cycles and educate audiences on sustainability. **3. Fashion & Textile Arts** • Bio fabricated & Plant-Based Textiles: Materials like lab-grown leather, mushroom leather, hemp, and algae-based fabrics replace synthetic fibres like polyester. • Upcycled & Recycled Fashion: Old textiles are repurposed into new garments, reducing fashion waste. • Natural Dyes: Indigo, madder root, beetroot, and other plant-based dyes offer non-toxic alternatives to chemical-laden textile dyes.

	4. Architecture & Urban Design • Green Building Materials: Bamboo, hempcrete, and straw bale provide natural insulation and reduce carbon emissions. • Bio-Inspired Urban Designs: Living walls, vertical gardens, and biomimicry-based solutions enhance sustainability in cities. • Recycled Construction Materials: Using reclaimed wood and bioplastics reduces the demand for new resources and promotes circular design. **5. Storytelling & Awareness Through Art** • Environmental Installations: Public art exhibitions highlight pollution and climate change (e.g., sculptures made from waste materials). • Theatre & Performance Art: Climate-focused plays and immersive exhibitions educate audiences in an interactive way. • Interactive Exhibits: Engaging displays allow people to experience the difference between biodegradable and non-biodegradable materials.
5. What aspects of nature inspire you the most when thinking about design? (listed according to respondents' votes)	1. Colours 2. Shapes & Forms 3. Patterns & Texture 4. Materials 5. Movement 6. Growth & Evolution
	1. Upcycling & Repurposing • **Upcycling Old Clothes into New Fashion:** Transform worn-out clothes into tote bags, accessories, or new garments. • **DIY Furniture from Scrap Materials:** Host workshops where participants create furniture from discarded materials. • **Reverse Engineering & Repair:** Taking apart old electronics (phones, toasters, laptops) to understand design flaws and learn repair skills.

6. Hands-on-practice examples that could make us shift from consumers to active creators, either about practical skills of required mindset shifts.	• **Using "Waste" Creatively:** Converting old glass jars into home decor, planters, or lamps instead of throwing them away. **2. Zero-Waste & DIY Living** • **Making Your Own Cleaning Products:** Use vinegar, baking soda, and lemon to create eco-friendly cleaning solutions. • **DIY Home Essentials:** Create homemade toothpaste, natural soaps, and reusable cloth napkins instead of relying on packaged products. • **Fixing & Repairing Items:** Organize community repair events where people learn to fix electronics, furniture, and clothes instead of discarding them. • **Using Recycled Plastics for Ornaments:** Repurpose plastic waste into jewellery, decorations, or household items. **3. Gardening & Sustainable Food Production** • **Starting a Home Vegetable Garden:** Grow herbs, vegetables, and fruit in containers or garden plots. • **Composting Kitchen Waste:** Teach people how to turn food scraps into fertilizer to enrich soil. • **Sustainable Urban Farming:** Educate communities on how to grow food in small urban spaces. • **Mindset Shift:** Learning how food is grown fosters appreciation and reduces overconsumption. **4. Renewable Energy & Technology Awareness** • **Building a Solar-Powered Charger or Light:** Teach students to assemble solar panels for small devices. • **Human-Powered Machines:** Bicycle-powered phone chargers or mechanical water pumps to illustrate energy conversion.

	• **Home Energy Monitoring Projects:** Use open-sourced tools like Arduino to track and reduce energy waste. **5. Hands-On Learning & Community Engagement** • **Incorporating Sustainability into Schools:** Create projects where students can only use recycled or natural materials. • **Workshops & Repair Cafés:** Set up public spaces where people can repair and repurpose old items. • **Sustainability Playgrounds & Parks:** Schools and parks become hubs for learning sustainable practices like bio-based paints and solar-powered lighting. • **Curiosity-Driven Mindset:** Encouraging people to explore sustainability through hands-on experiments and problem-solving.

3. Online consultation survey results for Bioeconomy Youth Debate #3

Questions	Participants answers
1. Rank these areas in order of where youth can influence policies the most (from most to least voted)	1. Waste Management 2. Sustainable Agriculture 3. Renewable Energy 4. Biodiversity
2. Rank the barriers that are hindering youth from shaping policies that impact their future (from most to least voted)	1. Limited access to policy-making processes 2. Lack of policy education 3. Political & bureaucratic barriers 4. Cultural & social norms 5. Insufficient youth representation
	1. Local-Level Youth-Led Policy Changes • Fridays for Future Local Impact (Berlin, Milan, Barcelona, etc.): Inspired by Greta Thunberg, young activists pressured city governments to declare climate emergencies and commit to carbon neutrality.

	• Bye Bye Plastic Bags (Bali, Indonesia): Founded by sisters Melati and Isabel Wijsen, this youth movement successfully campaigned for Bali's government to ban single-use plastics. • Zero Waste Movement (Kamikatsu, Japan): Local youth activists helped implement a town-wide zero-waste policy, inspiring other municipalities to follow suit. • Plastic-Free Schools (Kerala, India): A youth-led movement worked with policymakers to introduce biodegradable alternatives and waste management programs in schools. • Just Go Zero Tilos (Greece): The island of Tilos became the world's first zero-waste-certified island, engaging youth in comprehensive waste management practices.
3. Give successful examples where young people have shaped policies towards a sustainable future (local, national, international level)	**2. National-Level Youth Advocacy & Policy Influence** • Youth Climate Council (Denmark): Established in 2019, this council influenced Denmark's ambitious climate law, committing to a 70% reduction in greenhouse gas emissions by 2030. • Juliana v. United States (USA): Xiuhtezcatl Martinez and 20 youth plaintiffs sued the U.S. government for inaction on climate change, pushing environmental accountability into public discourse. • Belgian Climate Strikes (Belgium): Led by Anuna De Wever, these strikes pressured the Belgian government into prioritizing sustainability and stricter climate policies. • Farms of the Future (France): A youth-led agroecology initiative influenced national policies on urban and sustainable farming. • Nordic Youth Position on Sustainable Bioeconomy (Nordic Countries): Young representatives successfully advocated for stronger sustainability criteria in bioeconomy policies.

	3. International-Level Youth Policy Impact • UN Youth Climate Summit (Global): Activists like Greta Thunberg and Vanessa Nakate successfully pressured world leaders to allocate more funding for climate adaptation and youth involvement in policy. • Luisa Neubauer & the European Green Deal (Germany/EU): Her advocacy contributed to the EU's adoption of net-zero emissions targets by 2050 and strengthened youth participation in EU policymaking. • COP Youth Delegations (Global): YOUNGO and other youth groups influenced COP26 discussions, leading to increased climate education efforts and adaptation funding. • European Youth Parliament (EYP): Youth members proposed policy resolutions promoting the role of bioeconomy in achieving a circular economy. • European Youth Biodiversity Network (EYBN): A network of young environmental activists advocating for biodiversity-related policies in the EU. **4. Lessons from These Youth-Led Movements** • Grassroots Movements Can Scale: Local activism often leads to broader national and international policy impact. • Policy Engagement is Crucial: Working directly with policymakers (e.g., Youth Climate Councils) leads to tangible legislative changes. • Youth Representation Works: Giving young people a seat at the table strengthens sustainability commitments at all levels.
	Environmental challenges Very effectively: 30% Effectively: 65% Neither effectively nor ineffectively: 5% **Economic challenges** Very effectively: 15% Effectively: 50%

4. Can the bioeconomy help reduce the following challenges faced by people working in regular jobs?	Neither effectively nor ineffectively: 30% Not at all: 5% **Social challenges** Very effectively: 10% Effectively: 60% Neither effectively nor ineffectively: 30% **Psychological / health challenges** Very effectively: 10% Effectively: 45% Neither effectively nor ineffectively: 40% Ineffectively: 5% **Legal / regulatory challenges** Effectively: 30% Neither effectively nor ineffectively: 60% Ineffectively: 10%
5. Rank the following stakeholder groups that you think play the most important role in benefiting marginalised communities through the bioeconomy:	1. Community Organisations 2. NGOs 3. Local Governments 4. SMEs
6. Rank the following assets that the educational system could integrate to better prepare young people to understand policy, political systems, and their rights	1. Youth participation in decision-making 2. Rights and Advocacy training 3. Civil education 4. Digital tools for political engagement 5. Partnerships with policy makers 6. Political workshops 7. International perspectives

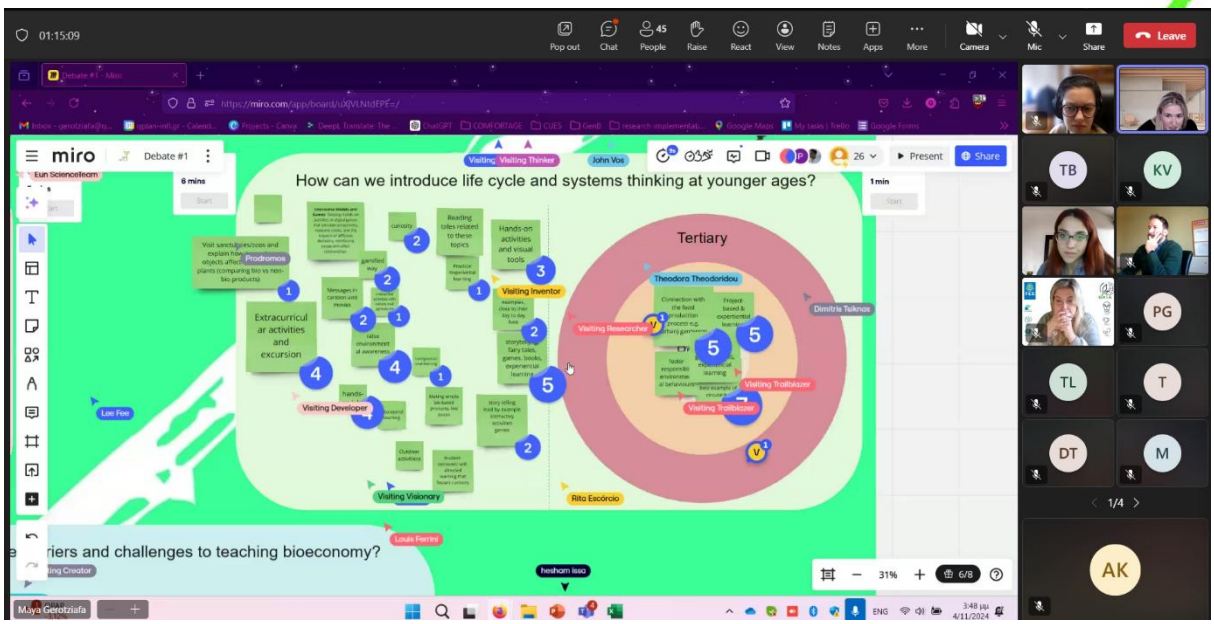

Figure 4: Photo from Debate #1

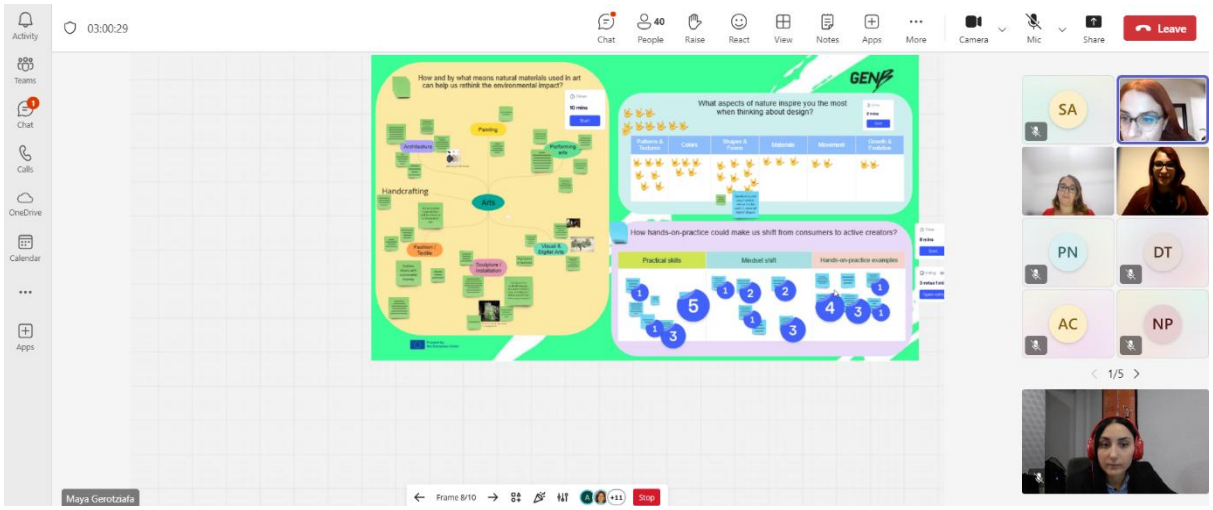

Figure 5: Photo from Debate #2

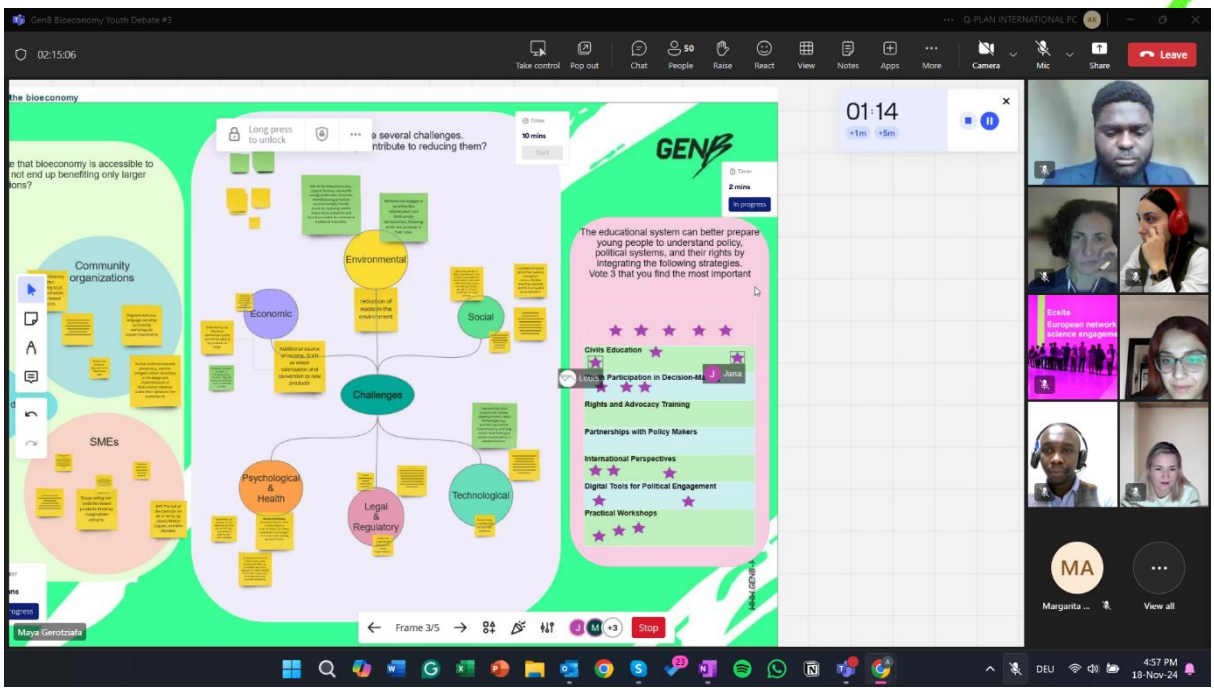

Figure 6: Photo from Debate #3

d. GenB International Bioeconomy workshop “Youth2Policy for our GenB Future”

The "Youth2Policy for our GenB Future" online international workshop was held on January 30th, 2025.

You may visit the GenB website to access the event’s Agenda.

The following table includes the main outcomes stemming from the MIRO Board session during the “Youth2Policy for our GenB Future” GenB International Workshop.

Barriers	Participants answers
1. Hard to get involved	- Use digital tools such as social media. - Organise and participate in hackathons, innovation challenges, and events specifically for young people interested in bioeconomy. -Offer internships, apprenticeships, or mentorship programs in bioeconomy-related fields to provide direct pathways for involvement.
2. Not enough knowledge	- Integrate bioeconomy into existing curricula. - Create youth-led events or platforms where young people can share their ideas and solutions for bioeconomy challenges. - Follow TEDx Talks, MOOCs or other free online education sources. - Ask for fundings for bioeconomy trainings and integrate AI tools for bioeconomy transition. - Create easily digestible content (e.g., videos, infographics) explaining bioeconomy concepts to make learning more accessible. - Make the GenB capacity building widely adopted. - Be in a constant learning process, read a lot of scientific information and research on a topic you are passionate about. - Develop targeted educational programs and workshops to raise awareness about bioeconomy among youth.

3. Complex bureaucratic mechanisms	- Simplified regulations and support from policymakers to encourage youth involvement. - Develop a guide or toolkit to help young people navigate the regulatory landscape more easily. - Establishment of a youth-specific regulatory task force to identify and address key bureaucratic barriers for young entrepreneurs. - Facilitate access to policymaking processes through facilitators and enablers. - Build bridges with Policymakers. - Legal/administrative trainings to be able to access public grants and subsidies
4. Few Young Voices Heard	- Despite the difficulty for young and/or inexperienced people to be taken into account, it is important to have a strong voice and opinion. - Elaborate value proposition attractive for young people to be motivated. - Go to where the youth are – seniors often expect youth to come to meetings, so going where they feel comfortable can have more impact. - Create spaces for involvement in the commons. - Give more visibility of the youth's ideas in the institutional contexts. - Give young people opportunities to dialogue with people of authority. - Highlight young people who have made change so that others are inspired to do the same. - Involve young people to workshops with older participants. European Rural Parliament NGOs have to take younger people with them.

5. Traditions holding us back	- Highlight success stories of young people who have successfully integrated bioeconomy into traditional industries to inspire others. - Integrate new and traditional by building bridges and making progressive transitions. - Change the mindset of what is not considered as 'normal' is not even possible. - Co-creation workshops where young entrepreneurs and experienced leaders can co-develop solutions towards mainstreaming bioeconomy solutions. - Show through practical means that novel practices are better, or those traditional ways are harmful. - Traditional entrepreneurs need proof that bioeconomy solutions are viable, so young people should investigate to find examples with facts not only about environmental sustainability but also economic sustainability.

By a voting session, the participants selected the most prominent sticky notes in terms of feasibility and impact.

1. Offer internships, apprenticeships, or mentorship programs in bioeconomy-related fields to provide direct pathways for involvement.
2. Simplified regulations and support from policymakers to encourage youth involvement
3. Keep sharing your perspective and success stories
4. Organise hackathons, innovation challenges, and events specifically for young people interested in the bioeconomy
5. Integrate bioeconomy topics into schools and universities to build capacity/expertise
6. Develop a guide or toolkit to help young people navigate the regulatory landscape more easily
7. Despite the difficulty for young and/or inexperienced people to be considered, it is important to have a strong voice and opinion.
8. Establishment of a youth-specific regulatory task force to identify and address key bureaucratic barriers for young entrepreneurs
9. Build consciously, using sustainable materials

Followingly they were asked to place a coloured star next to the sticky note that they believed was a quick win (green star), it needed more work (blue star) and not there yet (purple star). The aim of this exercise was to create a timeline for action for the next 5-10 years. The timeline was divided into 3 terms (i) short-term (1-2 years), (ii) medium-term (3-5 years) and (iii) long-term (6+ years).

Quick wins:

1. Organise hackathons, innovation challenges, and events specifically for young people interested in the bioeconomy
2. Keep sharing your perspective and success stories
3. Offer internships, apprenticeships, or mentorship programs in bioeconomy-related fields to provide direct pathways for involvement.

Need more work:

1. Integrate bioeconomy topics into schools and universities to build capacity/expertise
2. Simplified regulations and support from policymakers to encourage youth involvement
3. Despite the difficulty for young and/or inexperienced people to be taken into account, it is important to have a strong voice and opinion.
4. Build consciously by using sustainable materials

Not there yet:

1. Establishment of a youth-specific regulatory task force to identify and address key bureaucratic barriers for young entrepreneurs.
2. Develop a guide or toolkit to help young people navigate the regulatory landscape more easily.

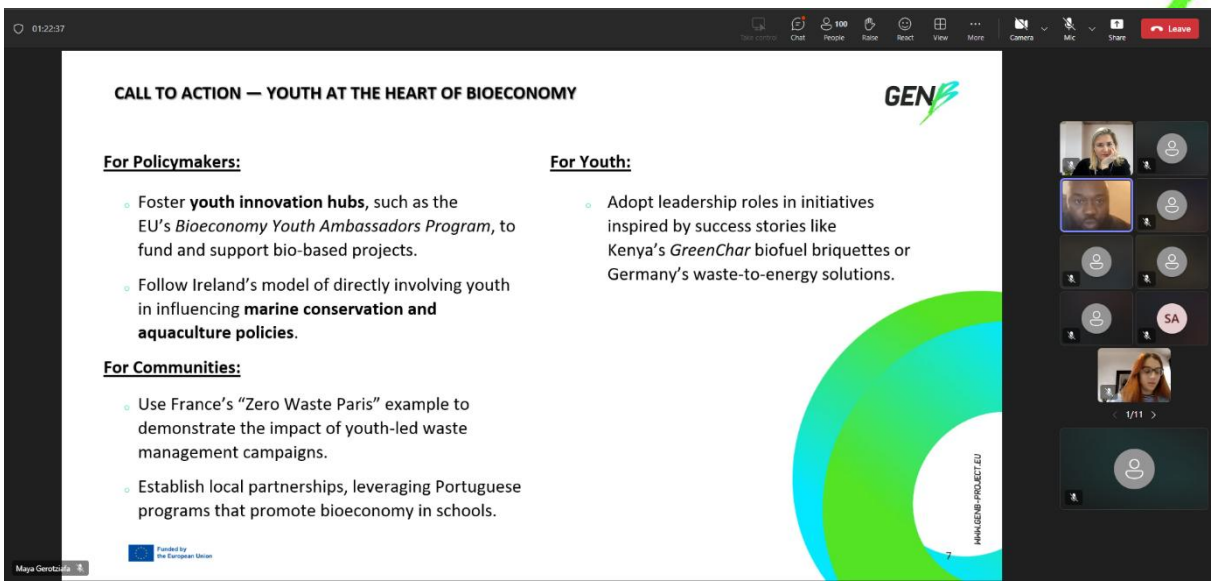

Figure 7: Photo from "Youth2Policy for our GenB Future"

GEN

OUR CONSORTIUM

APRE Agenzia per la Promozione della Ricerca Europea

btg biomass technology group

LOBA®

PEDAL CONSULTING

European Schoolnet

ZSI

aiju INSTITUTO TECNOLÓGICO DE PRODUCTO INFANTIL Y OCIO

Q-PLAN INTERNATIONAL

FVA NEW MEDIA RESEARCH

Hellenic Society for the Protection of Nature

Funded by the European Union

www.genb-project.eu

info@genb-project.eu