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Best Practice Guidelines and Delivery Mechanisms for Local Operators and Innovation Developers

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Table of Abbreviations and Acronyms

Abbreviation	Meaning
BBI JU	Bio-based Industries Joint Undertaking
CoP	Community of Practice
EIT	European Institute of Innovation & Technology
EuBioNet	European Bioeconomy Network
GA (no)	Grant Agreement (number)
HE Project	Horizon Europe Project
SWOT Analysis	Strenghts, Weaknesses, Opportunities, Threats Analysis
VET	Vocational Education and Training
WP	Work Package

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1 Executive Summary

This report will summarise the activities that have been implemented in BioGov.net Communities of Practice-CoPs, including focus groups, co-creation workshops, co-design workshops, the regional policy workshops and further outreach activities. It will report on the results generated through the CoP involvement, as well as reflect on these activities to show takeaways and lessons learned. National differences in outcomes, as well as identified needs and demands, will be highlighted.

BioGov.net is a three-year project funded by the Horizon Europe programme, composed of 10 experienced partners that operationalise the project's activities in eight EU countries: Estonia, Italy, the Netherlands, Greece, Slovakia the Czech Republic, Portugal and Germany.

BioGov.net's objective is to create a solid foundation for an innovative governance model in bioeconomy training and skills development, including consolidating regional Communities of Practice for multi-stakeholder inclusion. The project's participatory bottom-up approach -involving the local stakeholders, addressing their specific needs and co-creating suitable and tailored meaning behind general concepts and methodologies- ensured a work from a common ground towards transferability of outcomes. Although reaching towards a wide geographical scope, BioGov.net addressed regional conditions and worked on specific particularities and cultural characteristics, also encouraging the discussions between participants and enhancing their interests' alignment.

This deliverable introduces the Work Package aims and tasks, describes the implemented engagement activities, methods and tools, and highlights barriers encountered. Lessons learned, identified future needs and demands feed into recommendations for possible future participatory engagement processes.

BioGov.net followed the "Design Thinking" approach to problem-solving. The partners engaged relevant stakeholders and fostered active discussions to understand user needs, define their problems and generate ideas and recommendations for an improvement of bioeconomy education. The approach was implemented through a series of events and workshops, starting with a focus group followed by co-creation and co-design workshops, culminating in regional policy workshops. The sequencing activities employed by the project partners mobilized European Communities of Practice in bio-based systems and led to a deeper understanding of regional challenges in bioeconomy education. Reports from all events and workshops have been collected and summarised in country overviews.

The tools and methods for the different steps of the Design Thinking process are manifold. BioGov.net partners applied a variety of formats suggested by the consortium and also by D3.1 (Q-PLAN). Partners also draw on their experience on how to engage with their Communities of Practice during the different in-person and online workshop formats.

In general, it was stated that the applied "Design Thinking" approach proved to be effective. Engaging a diverse range of stakeholders, including research and higher education organizations, public authorities, industry representatives, civil society organisations, art & creative industries and VET stakeholders, was experienced as crucial but challenging.

Barriers encountered addressed two different aspects: Barriers for an improved or intensified bioeconomy and the related educational efforts, and barriers encountered when engaging with the regional or national stakeholders.

The cross-national exchange of findings significantly contributed to the expected project outcomes for better governance and skills development networks in the bioeconomy. Findings and recommendations for further engagement underline the high importance of participatory engagement for a European Framework for bioeconomy education.

2 Introduction – BioGov.net in a nutshell

The bioeconomy is expected to be a lever for sustainability and a solution to several ecological and social challenges, with a need for establishing the means for exploring new paths to govern the transition process, in particular by making information and knowledge available and accessible. Assessing the regional needs and good practices plays a crucial role in defining targeted strategies towards fostering bioeconomy education and capacity building. This needs to bring the various stakeholders together to co-create guidelines for bioeconomy training and mentoring, and explore how to develop systemic thinking despite different regional forms and applications. Moreover, encourage and facilitate inclusion and awareness to pursue in the long run a possible career in the bioeconomy.

Ten experienced partners from eight EU countries – Estonia, Greece, Portugal, Slovakia, Italy, the Netherlands, the Czech Republic and Germany -, funded by the Horizon Europe programme, operationalised the project's activities.

BioGov.net aims to contribute with establishing innovative governance models in the bioeconomy by providing an inclusive training and mentoring framework in specific European regions and building a bridge between knowledge and skills in the bioeconomy, secured by effective governance.

The geographical scope of intervention of the BioGov.net project focuses on eight regions from these EU countries: Estonia, Greece, Portugal, Slovakia, Italy, the Czech Republic, the Netherlands and Germany. The project's methodology comprises the following actions:

- Conduct a regional assessment of bioeconomy education needs with a special focus on Vocational Training and Life-Long Learning.
- Identify good practices and case studies in bioeconomy education, training and capacity building.
- Mobilise European Communities of Practice for better governance and skills development in the bioeconomy in eight European countries.
- Identify and promote new ways to strengthen the role of arts and creativity in bioeconomy education, aiming to inspire, engage, encourage creative thinking, and facilitate inclusion.

BioGov.net's objective is to create a solid foundation for an innovative governance model in bioeconomy training and skills development, included the consolidation of regional Communities of Practice for multi-stakeholder inclusion. The project's participatory bottom-up approach, involving the local stakeholders, addressing their specific needs and co-creating suitable and tailored meaning behind general concepts and methodologies, ensured to work from common ground for the transferability of outcomes. (see Fig. 1).

Although reaching towards a wide geographical scope, BioGov.net addressed regional conditions and worked on specific particularities and cultural characteristics, also encouraging the discussions between participants and enhancing their interests' alignment.

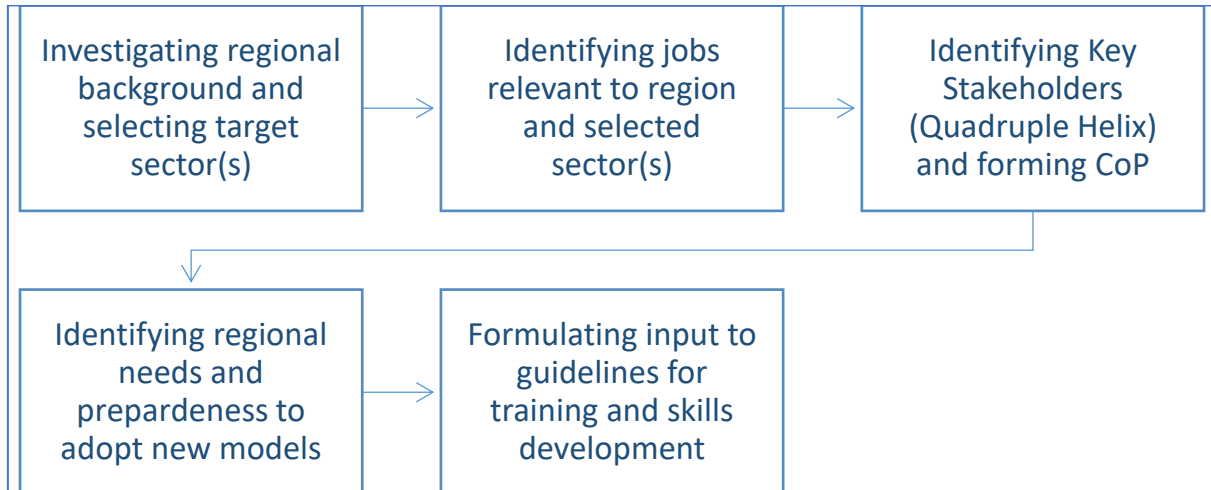


Figure 1: BioGov.net's general process and project workflow

The engagement of local networks and Communities of Practice was at the heart of project activities. Based on a project specific strategy for the setup of eight local co-creation teams into Communities of practice (Deliverable D3.1) guidelines for the creation of feedback and validation loops between the participating stakeholders were provided. The methodologies applied were focus groups, co-creation, co-design and policy workshops (See Fig. 2).

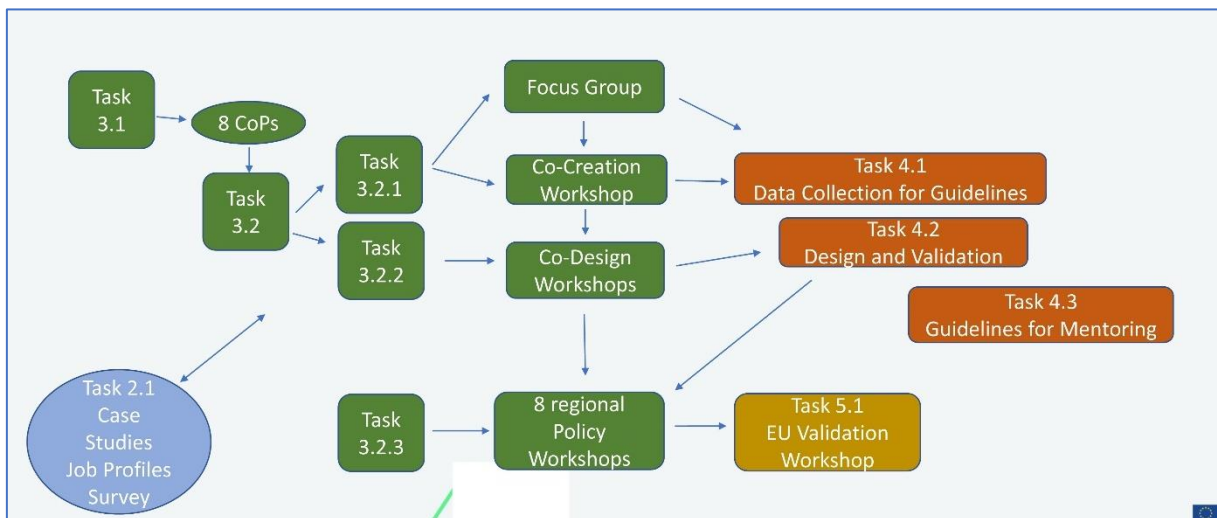


Figure 2: Connections between work packages in BioGov.net

The Identification and analysis of existing actions towards good governance approaches to trainings and skill building, especially those follow the system-thinking, offered input for discussions and validation in the CoPs. Regional data collection with and through the CoPs provided case studies, good practices and promising job profiles in the bioeconomy, but also needs and challenges when thinking about educational approaches. The

work within the CoPs allowed to understand each region's main characteristics and nature, as well as the preparedness to adopt innovative models in training and skills development, taking into account the infrastructures, technological capacities, design, art and culture of the regions.

Finally, practical guidelines for network engagement and the design of training and skills development will be grounded on a thorough analysis of collected information from the CoPs, good practices and partners' own experiences (WP4). The transferability of these general guidelines was further validated through the CoPs and regional networks (WP5).

3 Overview of Work Package Aims and concrete Task Description¹

BioGov.net aimed for a deep engagement of all actors in co-creation activities in each region. Deep engagement includes the methods ensuring social innovation and integration of the contribution from the research / education / bio-industries / humanities/ art / design / culture, but also from local operators and innovators, active communities, and administrations. The methodology for each of the events was agreed between all organizing partners by using formats previously exploited in other projects.

To support the project's co-creation and co-design approach, a series of different workshops were organised. The goal was twofold: first, allow the identification of needs, i.e. exploring the viability of ideas, and second, build momentum with the stakeholders taking part in the workshops.

Therefore, work started with preparations for setting up local/regional networks (Task 3.1) and the development of the strategy, framework and guidelines for inclusive engagement of target groups in eight co-creation teams (Communities of Practice), including a dedicated strategy for inclusion of marginalised groups in training concepts development. Stakeholders were addressed from work fields of adult learning, retraining and skills' development, and included bio-systems (industries, SMEs, researchers), active communities (national cultural and natural heritage keepers, artists, designers, professionals' associations) but also citizen's organisations, policy makers and researcher's in each region. The strategy included the methodology for creation of feedback loops between the participating stakeholders with focus groups, co-creation and policy workshops, and after the validation (Task 3.2 and Task 5.2). The "Strategy and guidelines for setup the local co-creation teams" in the form of Communities of Practice (D3.1) was provided.

Following the guidelines given by Task 3.1, in Task 3.2, eight Communities of Practice were established to support deep engagement of all actors in co-creation events in each region. The methodology for each of the events was agreed between all organizing partners by using the formats exploited in BIOVOICES, BIOBRIDGES projects, and also the BIOEASTsUP project. The outcomes of focus groups, co-creation, co-design and policy workshops fed the preparation of training and mentoring guidelines but also gave insight on how to integrate the opportunities created by the human-centric principles, offered by art, culture and (eco)-design.

¹ In the amendment (signed by the Granting Authority on 15/06/2023) the number of co-design workshops was changed from 3 to 2. The rationale was, at that time, that we split 1 designation into two events thus we could reduce the co-design workshops from 3 to 2, not affecting the total number of events (4 in total as in the initially approved Grant Agreement),

4 The implemented Engagement Activities

two sub-tasks, regional focus groups, co-creation workshops (Task 3.2.1) and regional co-design workshops (Task 3.2.2) were organised. The Focus Groups were the initial activity for the mobilisation of the CoPs and mutual learning and knowledge sharing. Input was delivered by WP2. Eight focus groups and eight co-creation workshops for local Communities of Practice tackled the regional challenges regarding social inclusion, the role of novel technologies, cultural and heritage aspects in bioeconomy and training and skills development opportunities. The co-creation workshops focused on identifying training needs, job profiles and policy limitations, as well as analysed the educational, training, and retraining availabilities in each CoP region.

The aim of regional co-design workshops (Task 3.2.2) was to define the key drivers for the national bioeconomy and provide input and validation for bioeconomy training and mentoring guidelines. In total, two co-design workshops were organized in each region in collaboration with local museums, science/technology organisations, and/or art centres for inclusion of citizen science, facilitating social innovation, implementing new social practices and enabling social ownership for inputs to strategic choices for the region regarding the bioeconomy's wider uptake.

Finally eight policy workshops, one in each region (Task 3.2.3), were organised to address the gaps in current governance systems and feedback loops for better strategy design in bioeconomy skills development at multiple levels.

All partners have set up CoPs in their countries and organised (as lead or co-lead) focus groups, co-creation and co-design workshops between April and November 2023, either as in person workshops, hybrid or fully online – in each case adapted to local needs and availability of stakeholders (Tasks 3.2.1, Task 3.2.2, and Task 3.2.3) (see Fig. 3).

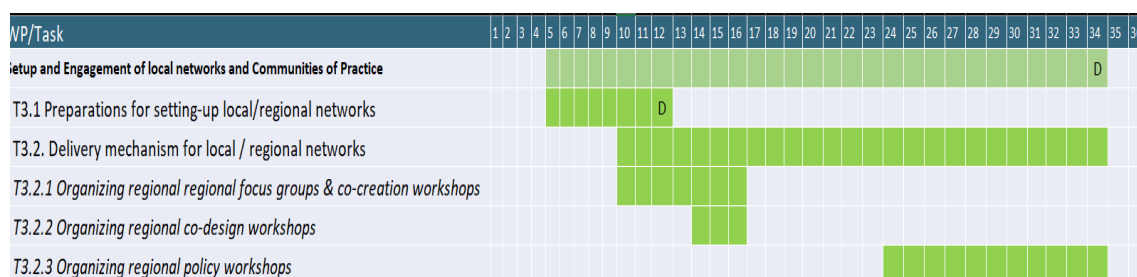


Figure 3: Timeline of tasks.

Partners from Germany, Estonia and the Czech Republic found it difficult to involve a large number of Community of Practice members in live events. The first resonance of stakeholders when being addressed was good, but participation in actions (meetings or surveys) and providing consent remained low. Especially companies were not able to attend or answer questions and declared a lack of time. But also, the initiatives and organizations that were already active in the regions refrained from participating in the activities of the project. To compensate for the limited feedback and participation people were asked to take part in surveys. To compensate for limited feedback and participation,

people were asked to add input to the findings of their workshops through a total of 75 interviews with additional stakeholders (See Fig. 4).

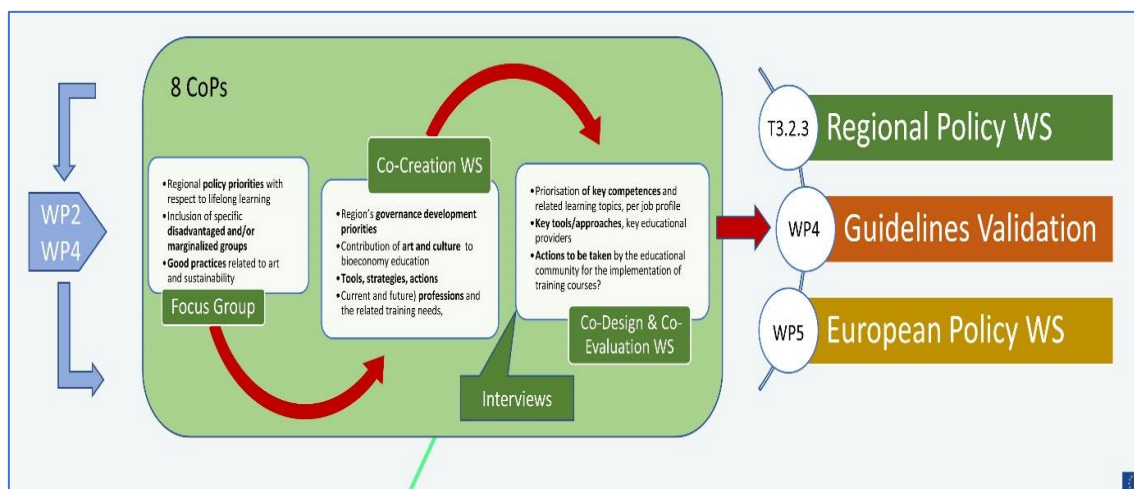


Figure 4 Workflow of CoP engagement activities in BioGov.net

	Total no.	Education providers	Economic actors	Policy-makers & administrations	Arts sector	Funding agencies	wider society
Estonia	26	12	9	3	9	3	two (arts sector)
Greece	72	15	20	18	3	0	16
Portugal	33	20	7	4	7	2	
Slovakia	74	24	14	18	4	1	13
Italy	110	60	4	28	13	1	4
Netherlands	38	14	17	1	17	5	1
Czech Republic	6	5	1	0	1	0	0
Germany	32	12	10	4	1	0	5
Total	308	80	75	37	70	29	24

Table 1: Number of people involved in CoP focus group, co-creation, co-design and policy workshop activities

Design Thinking

Design thinking is particularly effective for tackling complex, well-defined problems and is widely used in various fields, including product design, business strategies, and social innovation.

BioGov.net follows the Design Thinking methodology for the implementation of its workshops and co-creation activities. Design thinking is a problem-solving approach that em-

phasizes understanding user needs and iterating solutions. The process typically involves the following key steps: 1. Empathy: Develop an understanding of user behaviour and needs by engaging with them directly, 2. Define: Clearly articulate the problem you are trying to solve, 3. Ideate: Generate a wide range of ideas and solutions through brainstorming and sketching, 4. Prototype: Create simple models of your ideas to explore their feasibility, 5. Test: Gather feedback on your prototypes and iterate on the design based on user input.

In BioGov.net Focus Groups were set up to get a deeper understanding of needs and request of stakeholders in the partner's regions, Co-creation workshops helped to clearly articulate these needs and co-design workshops contributed to the development of recommendations. In BioGov.net the developed solutions include policy recommendations and guidelines for designing biobased training programs in co-creation with stakeholders (D4.2), including the instruments for collaborative learning and exchange of experiences or the deployment of methodologies for training and mentoring programmes (D5.2).

Tools and methods for the different steps of the Design Thinking process are manifold and were applied by BioGov.net to engage with their communities of practice during the

different workshop formats (see also Deliverable 3.1 "Strategy and Guidelines for setting up local co-creation labs"). On-site events had icebreakers, such as the LEGO challenge, a tour-de-table or a field trip, roundtables, panel discussions, brainstorming elements with flip-charts or Post-Its and worked in World Café formats, using the project's job profile cards (see figure 5) for sketching and feedback. The use of Design Thinking tools like "Mind Mapping" and "How Might We", facilitated structured innovation and creative problem-solving. Coffee breaks were important and allowed networking and further ideation.

The related digital tools were used when events were organised online, e.g. through TEAMS, ZOOM, WebEx, Google Meet or others. MIRO Board and Mural Board were chosen for online meetings, as effective online white-board tools to visualize ideas and work



Figure 5: Job profile card

on project-related tasks and questions, either individually or in a group. MENTIMETER was used in some CoP Events, as a presentation tool that allows real-time interaction, taking polls, or presenting quizzes. It has turned out to be a useful 'warm-up' or ice-breaker for workshop participants before deep-diving into dialogue and consultations.

Small group discussions were implemented in online break-out rooms, offered by the communication software.

In more detail:

Estonia explored new formats, including panel discussions and a field trip to engage with their stakeholders. Initially proposed co-creation workshops did not work very well but novel formats for exchange and networking opportunities have been most attractive.

In the Greek Community of Practice (CoP), the implementation of activities included a focus on integrating art and creativity into bioeconomy education, which stood out as a unique approach. During CoP meetings, which were all physical, the use of Design Thinking tools like "Mind Mapping" and "How Might We" facilitated structured innovation and creative problem-solving. Additionally, the emphasis on involving marginalized groups in bioeconomy job profiles and educational programs was a notable aspect that should not be missed.

In Portugal, combining different formats in one event led to fruitful discussions. The acceptance of digital workshops was higher than with on-site events, offering easy participation. The co-creation workshop made use of the MIRO Board.

In Slovakia interactive educational formats such as virtual reality, online resources, and case studies were particularly effective in animating discussions and keeping participants engaged. Implemented events included presentations and discussions, online facilitated through a MIRO Board.

In Italy, for the workshops, MIRO Boards were used to facilitate the engagement of the participants and to collect their inputs. Future implementation scenarios were visualized. Participants were able to contribute their vision of an educational system able to effectively respond to the specific training needs. An additional interactive session was organized using MENTIMETER to define recommendations for educational development.

In the Netherlands, the Focus group partners were allowed to share their vision and activities in the field of (vocational) training | education | lifelong learning. The first part started with a plenary discussion and a brief introduction of all the participants (tour-de-table). Then a second part was organised in roundtables. Thus, open debate was possible in smaller groups with the objective of identifying needs and regional priorities in the bioeconomy sector. Preparation – e.g. making and using the job profiles cards – helped in getting sufficient interaction. Splitting into groups worked well to ensure engagement of nearly all. The use of Mural was helpful to structure the discussion in online events like the co-design workshop. For the policy related activity, the semi-structured interview was chosen as format.

In Germany it turned out that online meetings were most suitable for stakeholders. Working with job profiles and case studies and videos helped to visualize food for thought for future scenarios. Low participation was offset by additional interviews.

Regional settings

In most regions, a representative number of stakeholders in total was reached except for the Czech Republic, due to the concentration of activities targeting only a small region within the country. As a strategy for intensifying actions, activities were expanded to the

whole country to align also with other partners such as Estonia and Slovakia. Estonia took the approach of narrowing the scope of the local Community of Practice to the blue bioeconomy. The German partner reached out for participants of a territory highly engaged in structural change activities (due to the termination of coal mining) and which has established a regionally funded structure on bioeconomy. The Greek partner followed a multifaceted approach to invite experts across various sectors. The Italian partners kicked-off activities in two pilot regions (Apulia and Emilia Romagna) and then expanded the targeted group to representatives coming from all over Italy, to ensure a better representation of the entire country as a macro-region, considering the consistent differences and peculiarities of each specific region. The Dutch partners sought cooperation with BIOMODEL4REGIONS, an EU HE project (GA no, 101060476), which shares with BioGov.net the focus on regional aspects of the bioeconomy in the south-west of the Netherlands. The Portuguese partner strategy enlisted experts and entities across the country from various sectors related to bioeconomy, and the project targets. In Slovakia, stakeholders from all over the country were involved due to the geographical size and size of the population, as well as the fact that several key players are located in different regions of Slovakia.

For all project regions, it can be stated that the identification and involvement of stakeholders in the engagement activities was and still is a continuous process, especially under WP5 activities aiming at activating the CoPs to:

- validate the BioGov.net methodology and results collected at regional level through EU validation and co-creation workshop (1st EU validation and co-creation workshop under T5.1 and T5.2.1)
- co-create the final education and policy recommendations at transnational level (1st EU validation and co-creation workshop under T5.1 and T5.2.1)
- collect inputs for the Impact Assessment Framework through a questionnaire (T5.3)
- validate and fine-tune the final Impact Assessment Framework (2nd EU validation and co-creation workshop under T5.3 and T5.2.1)

All engagement activities were based on the results of work package 2, namely on results, insights and actionable knowledge gained by related bioeconomy projects (e.g., BE-RURAL, Power4Bio, and BIOEASTsUP), as well as by existing networks of the partners, and by synergies with relevant activities under H2020, including BBI JU, BIOEAST Initiative (BIOEAST Regions and bioeconomy hubs), EIT Knowledge and Innovation Communities, etc. Moreover, the CoP activities revolved around key findings delivered by WP2 targeted desk research, interviews of key regional stakeholders and bioeconomy Job profiles mapped by the BioGov.net project

For all engagement activities, guidelines and reporting templates (see Fig. 6) have been prepared and shared through deliverable 3.1 (Strategy and guidelines for setting up the local co-creation labs in the form of a Community of Practice). The deliverable included suggestions for methodologies, including baseline agendas and instructions for implementation to be used for preparation or during the events, such as the World Café, Scenario Forecast or digital tools, such as the MIRO Board. The suggested methodologies were suggested because they highly encourage interaction and exchange in a collaborative and creative way. A decision which methodology to apply during the events, e.g.

mind map, “Break and Build Ideas” methodology, or others, was made by the local organisers, even enriching with new tools when needed.

For each type of event partners reported on participants’ background, rationale and purpose of the event, main outcomes knowledge and insights expressed or gathered at the event, lessons learnt and partner’s own perspectives and comments and finally the take-aways, the top-level points to be considered for inclusion in other BioGov.net activities and recommendations. A summary across all events per country can be found in the appendix.

BioGov.net
Governance & Upskilling for a
Stronger Bioeconomy

Event Report Template

Total number of participants, out of which:

- A: Education providers
 - Research and higher educational organizations
 - Vocational education organizations
 - Other education providers (e.g., entrepreneurial education...)
- B: Economic actors (from across key sub-sectors/value chains)
 - Large industries (including multinationals)
 - Small businesses (SMEs, scale-ups, start-ups, etc.)
 - Industry trade associations, networks, clusters
- C: Policymakers & administrations
 - Local/regional governments
 - Local/regional employment offices
 - Local/regional public agencies
- D: Arts sector
 - Art creators
 - Art exhibitors
- E: Funding agencies (local, regional, national, international)
- F: Wider society
 - Organizations working with marginalized/disadvantaged/minority groups
 - Social and environmental NGOs
 - Other representatives of Citizens & Wider Society

Material created for the event, if any (link to the internal repository):

- Social media banners, posters

2. Rationale or Purpose of your Event:

3. Main Outcomes Knowledge & Insights expressed/gathered at the Event

4. Lessons learnt: BioGov.net partner's own perspectives & comments

On the event overall? E.g. willingness of participants to contribute

On the challenges discussed? E.g. points that "shone" with you/your organization

Any consensus points? E.g. a point that BioGov.net can drive forward

Any lessons learnt for shaping/managing future events? E.g. invite more people in expectation of "no shows"

5. Impact Report - what are the top-level points to be taken from the event to be considered for inclusion in the BioGov.net lessons learnt and recommendations to be used in other BioGov.net activities?

Please endeavour to contribute at least three points from your experience of this event/activity.

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Figure 6: Reporting Template (used to report every CoP event)

Events	Timing	Activities	Purpose of the event
Focus group	April-June 2023	CoPs validate the concepts/topics identified during regional desk research	Analysing knowledge gaps, barriers, and facilitators, identify actors and offers in the bio-based educational ecosystem
Co-creation workshop	July-October 2023	Training and skills development opportunities and needs for each region from the CoP point of view, feed into follow-up activities	Identify good practices and highlight success stories (case studies) in biobased trainings and support the employment in the bio-based sector
1 st Co-design workshop	October, 2023	The first co-design workshop focused on the needs of learners, as expressed by educators and mentors to develop guidelines for education according to expressed needs It also validated developed concepts/tools	Establish consultation mechanisms for the preparation of guidelines
2 nd Co-design	October 2023	The 2nd co-design workshop focused on the directions that training providers and decision-makers need to deliver for effective education on bioeconomy. Outcome is the description of the validation process for the training and mentoring guidelines	Regional point of view
Policy workshop	March-June 2024	Policy topics, Partially replaced by interviews when events were not possible or attended by many stakeholders	Provide recommendations to national bioeconomy policy, regarding the governance model and concerning education-related strategies

Table 2 Specific events involving CoPs and their purpose

4.1 Focus Groups

Focus groups follow a simple yet impactful methodology which brings together a small group of people to answer questions in a moderated setting. The group meets to explore and discuss predefined topics and answer questions prepared to assess project findings. The group shares its feedback, opinions, knowledge, and insights about the topics, Notes on the discussion and opinions of group members were collected in a prepared template.

As a focus group is a moderated group discussion with actual or potential users of project outcomes. It was implemented as the methodology for identifying user requirements and

for obtaining user feedback for the co-creation and design phase for guidelines, on specific content for recommendations and on the planned framework.

In BioGov.net, the objective of the focus groups was to kick-off the regional Communities of Practice while validating the project's desk research with sector key stakeholders regarding:

- Case studies (introduce the concept of integrating art and culture into the bioeconomy)
- Sector trends, possibilities, needs, barriers (regional SWOT)
- Job profiles and Skills/competences needed to transition to a sustainable bioeconomy
- Education in bioeconomy (Current state, recommendations, priorities, and challenges)
- Identification of stakeholders to engage in the future activities foreseen in the Community of Practice

All focus groups aimed to develop first steps towards a regional governance model supporting bioeconomy development and engage potential Community of Practice members. The focus was on lifelong learning in bioeconomy, vocational training and education, innovative educational models, and involvement of vulnerable, marginalized groups. The workshops included presentations and discussions to validate and collect additional case studies, identify regional needs and priorities, and target beneficiaries. Key discussions included defining bioeconomy, skills needed in the bioeconomy sectors, existing educational programs, connecting bioeconomy with art, ways how to reach out to marginalized groups.

In Estonia, the focus group took place onsite on June 8th, 2023, organized by Civitta Eesti. It focused on skills, validated case studies, and the relevance for the Estonian blue economy sector. There were six participants, mainly economic actors from the blue economy sector and education providers. The most relevant sector is aquaculture, together with aligned areas (Offshore farming).

In Greece, the focus group took place on May 29th, 2023, organized by Q-PLAN INTERNATIONAL. There were 14 participants, including education providers, economic actors, policymakers, and representatives from the arts and wider society.

In Portugal, the focus group took place onsite on June 21st, 2023, organized by LOBA in partnership with B2E coLAB – Blue Bioeconomy Colab. The event site was the Associação Nacional de Jovens Empresários in Porto. The event was organized in the context of the Portuguese Local CoP independent event. In total 13 participants, mainly education providers and economic actors attended the workshop.

In Slovakia, the focus group entitled "How to build competences and specific skills for the bioeconomy in the regions?" was organized by Pedal Consulting and held online via Zoom on June 13th, 2023.

In Italy, the focus groups were organized in two pilot regions by FVA in Apulia Region and UNIBO in Emilia Romagna Region. The first focus group organised by FVA took place on April 3rd, 2023, onsite at the University of Bari Aldo Moro. 40 people participated, 25 education providers, two economic actors, four policymakers, one funding agency,

two attendees from wider society. The second focus group organised by UNIBO took place on April 12th, 2023, onsite in Bologna. It targeted around 20 participants, mainly education providers.

In the Czech Republic, ART and its covering structure BioEast Hub CR belong to the BioEast platform and operate tightly with the structures and operational modes of it. Six academics (education & research), two people from the public administration (policy makers) and one from the wider society were involved in organizing focus groups.

In the Netherlands, the focus group took place on-site at Avans Hogeschool, on May 25th, 2023, 17 stakeholders, mainly education providers and education actors attended. Key factors for a development towards a regional governance model supporting bioeconomy were identified, such as companies that are open for change, tackling educational issues together, or a common vision for the long term (like life-long learning)

In Germany, the focus group took place onsite at the School Lab “JuLab”, located in the research center Jülich, on June 20th, 2023, organized by Bonn Science Shop, involving 10 participants, four education providers, one economic actor, two policymakers and one from wider society.

4.2 Co-Creation Workshops

The methodology of co-creation emerges from transformative processes in the entrepreneurial world and aims at facing structural changes and helping to address new challenges. This approach has been taken up by other fields, such as research, education, arts or the publishing sector. In the context of BioGov.net, the co-creation workshops followed the focus groups in each Region, aiming to capture the initial thoughts and needs of the local stakeholders. The objectives of the workshops were:

- To inform about the BioGov.net project results on governance of education and training in bioeconomy in Germany (survey).
- To select and identify the most relevant and important job profiles in the field of bioeconomy for the region and related skills needed.
- To discuss the possibilities for the integration of marginalized groups into bioeconomy.
- To consider matching points between circular bioeconomy and art, adding innovative accents, and finding ways how art and culture can contribute to bioeconomy.
- To outline future activities to motivate stakeholders to engage in future activities in the Community of Practice.

The co-creation workshop was the first step to collect views on the priorities and training needs regarding bioeconomy in the dedicated regions.

In Estonia, the co-creation workshop took place onsite and online on November 13th and 16th, 2023, with eight participants, organized by Civitta Eesti. The workshop focused on building competences and necessary skills for the blue bioeconomy, engaging learners in the blue economy and drafting corresponding recommendations. It aimed to initiate further discussion on the key competences and the integration of art in collaboration with natural sciences and industry. Making technical engineering more popular by means of

raising awareness and training was identified as an important target. Estonia has many unused opportunities in blue bioeconomy (aquaculture, wind power) due to a lack of knowledge, missing research & innovation approaches and a related curriculum for specific blue economy fields. Protected areas are seen as a barrier for the blue bioeconomy.

In Greece, the co-creation workshop entitled "Education in Bioeconomy – Overview of relevant bioeconomy job profiles" took place on July 18th, 2023, at OK!Thess in Thessaloniki, Greece, organized by Q-PLAN INTERNATIONAL. The workshop focused on educational priorities and training needs within Greece. The event gathered 11 participants, including education providers, economic actors, policymakers, and representatives from marginalized groups. The workshop allowed for discussion of the needs for new competences and skills for professions in the bioeconomy and the development of adequate educational programs. Participants reviewed 20 prioritized bioeconomy job profiles and identified skill gaps, emphasizing on the inclusion of marginalized groups in these job profiles. Key discussions included elements for setting development priorities for educational governance for 2025 and 2030, and implementing actions to achieve these goals. The workshop also explored how creativity and art can contribute to the coexistence of different social groups and the development of new educational models.

In Portugal, the co-creation workshop took place online on October 10th, 2023, organized by LOBA. It focused on educational priorities and training needs within Portugal. The workshop with 10 participants from mainly education providers and economic actors aimed at discussing the needs for new competences and skills for professions in the bioeconomy and adequate educational programs. Aspects on how to include marginalized groups were integrated in the discussion on job profiles.

In Italy, after launching the CoP activities in two pilot regions (Apulia and Emilia Romagna), the CoP leaders broadened the target group to include representatives from across Italy. This expansion aimed to ensure better representation of the country as a whole, acknowledging the significant differences and unique characteristics of each region. The co-creation workshop took place online on July 17th, 2023, organized by FVA, supported by UNIBO. In total 20 people participated: 15 education providers, two policymakers, three from the art sector. The objective of the workshop was to kick off the regional Community of Practice on life-long learning in bioeconomy, with a special focus on innovative formats stemming from the intersection between circular bioeconomy and art. The overall purpose of the workshop was to identify the regional needs concerning training in the bioeconomy sector. The event gathered participants representing 7 Italian regions (Lazio, Puglia, Basilicata, Sicilia, Emilia Romagna, Abruzzo, Liguria), ensuring a wider overview on the complexity and diversity of the Italian macro-region's needs and key priorities.

In the Czech Republic the Co Creation workshop took 2 February 2025 in Troubsko Czech Republic (where are the location of ART which is the BioGovNet partner). The Co-creation Workshop was designed to bring together the diverse members of the Community of Practice but also to be as open and inclusive as possible, thus the wide participation (45 participants). The aim was to have a substantial collaborative opinion on the shape of future directions for Bioeconomy education. The purpose was to foster a sense of shared ownership over the development of innovative, inclusive, and action-oriented

educational frameworks that respond to the evolving demands of the Bioeconomy various sectors. Outcomes were touching several key issues such as future activities, curricula, and initiatives. The Co creation methodology helped to gain viewpoints in perspectives from various stakeholders, after an interactive dialogue and brainstorming. 45 people participated. Among them they were 13 Education providers, 19 Economy actors, and 10 Policy makers.

In the Netherlands, the Dutch co-creation workshop took place on 13th September 2023 on site in Avans Hogeschool, Breda, organized by Avans and supported by BTG. The workshop focused on educational governance needs in the Dutch region. It aimed to initiate a discussion on competences and necessary skills for the bioeconomy in the region and dealt with the question of how art, culture and the creative industries can contribute to the development of educational programs. Outcomes were that training programs have to be tailored for respective target groups. Here, upskilling for employees was favoured instead of basic education. The general public was identified as too broad, so substantial guidance is needed to address this target group.

In Germany, the co-creation workshop took place online [via Zoom on September 6th, 2023](#), organized by WILA (WILA). It showcased best practices from the Rhinish mining area. It aimed at exchanging on competencies and skills needed for the implementation of regional structural changes and related regional jobs, defining what specific bioeconomy training and educational programmes should be offered. Methodologies applied included the MIRO Board for brainstorming and so-called deep dives, in-depth discussions on identified and high-ranked topics by MENTIMETER. Eight people participated, one education provider, three economic actors three policymakers.

In Slovakia, the co-creation workshop titled "How to build competences and necessary skills for the bioeconomy in the regions" was organized by PEDAL Consulting and was held online on October 13th, 2023. Objectives included summarizing bioeconomy priorities for Slovakia, identifying key professions and related competences and skills, and discussing models of educational programmes. The event included presentations and discussions facilitated through a MIRO Board and involved 21 participants from various sectors.

4.3 Co-Design Workshops

The Co-design workshops focused on the directions that training providers and decision-makers need to deliver for effective education on bioeconomy and to identify the shortcomings in the current Bioeconomy policies, In doing so. They have also laid the groundwork for informing training providers and guiding decision-makers towards the implementation of more efficacious educational initiatives, Participants were asked to explore ideas for the following questions:

- What are, or what should be. The learning objectives and outcomes of a training program?
- Who are the actors in the training and education sector who could implement these educational solutions?

- What actions should be taken by the educational community or policymakers for the implementation of training courses for the bioeconomy?
- How can we address and develop the most common skill gaps that were identified during the Job Profiles identification exercises?
- How can art and creativity be tools in adult education for the bioeconomy?

The second co-design event was merged with the eight focus groups foreseen in task 5, 1, for the validation of the proposed guidelines in the regional context to support the local balanced potentials within the framework of sustainability-driven policy and provide specific recommendations for the implementation of the regional training and mentoring programmes.

In Estonia, co-design activities took the form of additional interviews organized by Civitta Eesti, as this approach was better suited to the local Community of Practice.

In Greece, two co-design workshops were held to develop educational pathways in bioeconomy. The first workshop, titled "Educational Pathways in Bioeconomy – Needs of Learners Regarding Training in Bioeconomy, " took place on October 18th, 2023, at OK!Thess in Thessaloniki, Greece. Organized by Q-PLAN INTERNATIONAL, this workshop aimed to identify deficiencies in bioeconomy-related education and address the needs of trainees for new programs, learning styles, and actions in education. The event gathered 14 participants from various sectors, including education providers, economic actors, policymakers, and representatives from the arts and wider society. The second Co-design workshop, titled "Educational Pathways in Bioeconomy – Directions for Training Providers and Decision-Makers, " was held on November 7th, 2023, also at OK!Thess in Thessaloniki. This workshop aimed to develop effective educational programs for adults in bioeconomy, addressing current gaps in education and policy. It gathered 16 participants, including representatives from research and educational institutions, vocational training organizations, local governments, public agencies, industry stakeholders, NGOs, and the arts sector.

In Portugal, two co-design workshops took place online on October 10th, 2023, and on-site on October 30th, 2023, organized by LOBA. The second workshop was conducted through interviews (questionnaire) in the event "Planetiers World Gatherings 2023" that took place from 29-31 October in Aveiro, Portugal. Three people attended in online meeting and gave insight in interviews, mainly education providers and economic actors., Both formats aimed to gather valuable insights and perspectives from participants regarding the priorities of education and the skills and training needs related to the bioeconomy in Portugal. The Co-design formats fostered a collaborative discussion among the attendees to scope future activities of the Community of Practice.

In Slovakia, the first Co-Design Workshop entitled "Innovative forms of education for future skills in bioeconomy" was organized by PEDAL Consulting and held online on October 24th, 2023. The workshop focused on connecting formal and informal education with future skills for job profiles in the bioeconomy using the "Design thinking" methodology. The challenge addressed was "How to create educational content to match the future or existing job positions in the bioeconomy?" Participants developed the main challenge to "How could we help education providers adapt education to the current and future needs of the labour market so that graduates can be more successful in finding a job after graduation?" The event had eight participants from various sectors. The second

Co-Design Workshop titled “Innovative forms of education for future skills in bioeconomy” was organized by PEDAL Consulting and held online on November 3rd, 2023. The workshop continued focusing on connecting education with future skills for job profiles in the bioeconomy. The primary objective was to conceptualize a tangible format aimed at infusing practical experience into education. Participants self-selected into two discussion groups: "Practice-oriented Learning for Students in Vocational Education and Training" and "Development of Lifelong Informal Education and Adaptation to Different Age Categories or Disadvantaged/Vulnerable Groups of People ". The event involved nine participants from various sectors.

In Italy, the two co-design workshops “Bioeconomy and Art in the Italian educational pathways: designing future scenarios for the implementation”, were jointly organized by FVA and UNIBO online on October 24th and November 3rd, 2023, in the context of the [“European Vocational Skills Week 2023”](#) . The first co-design workshop engaged educational providers and mentors to generate guidelines, while the second co-design workshop involved stakeholders interested in education on sustainability, circular economy, bioeconomy, arts, and inclusiveness. The objective was to discuss and validate with a wider group of stakeholders the guidelines generated in the first co-design workshop, to finally provide educational and policy recommendations. In total there were 30 participants. The workshop focused on how formal and informal education can better connect with future skills for job profiles in the bioeconomy. MIRO Boards and MENTIMETER were used to gather inputs from the participants concerning training needs, recommendations, and actions to be taken to respond to identified educational priorities and the specific needs of industries and regions. The "Design Thinking" methodology allowed in-depth understanding of needs.

In the Czech Republic the purpose of the Co-Design Workshop was to collaboratively develop a shared vision, frameworks, and strategies related to Bioeconomy education. By bringing together a diverse Community of Practice and aiming to explore the collective expertise and perspectives of the involved stakeholders. Even though the participation was not great and the group of stakeholders was rather heterogeneous with the predominance of people from the Academia, the designs were inclusive, relevant to real challenges, and aligned with emerging trends in the Bioeconomy. Participants highlighted issues reflecting the Czech Reality and had ideas for further steps. The necessity of partnership between sectors and sector-specific education and training in order to enhance competitiveness were highlighted.

In the Netherlands, the first co-design workshop took place online on October 10th, 2023, organized by Avans Hogeschool, supported by BTG. The topic of learning programmes entailed a lot of discussion. It was carried out as an online event. The workshop had eight participants and used a Mural Board canvas to gather the input of the participants during the co-design process. Interdisciplinary collaboration, technical skills, environmental and safety awareness, communication skills, and problem-solving ability were considered key factors, Flexibility, work-life balance, modular education, utilization of new technology, and Lifelong Learning were considered important. Dutch VET programme developers need to consider effective recruitment and promotion strategies, sharing early successes.

In Germany, the first co-design workshop took place online on October 24th, 2023, organized by WILA (WILA). The workshop focused on collecting ideas on the design of vocational and regular bioeconomy trainings and contributions to the design of curricula in alignment with future skills needed for job profiles in bioeconomy. The "Design Thinking" method was used to develop creative solutions for complex problems. It included rapid brainstorming and a deep understanding and identification with the needs of the target groups. The fact that only two people attended was offset by the fact that the participants were experts with a profound knowledge from two stakeholder groups. The second co-design workshop took place online on October 31st, 2023. It focused on recommendation of training programs and the role of policymakers in that context. By applying the co-design methodology, participants were engaged in the discussion of the impact of bioeconomy trainings and the role assignment of different stakeholder groups. Four people from complementary stakeholder groups attended the workshop. They came from stakeholder groups that were complementary to those of the 1st workshop.

4.4 Regional / National Policy Workshops

The Regional policy workshops focused on addressing the presented gaps in current governance systems identified by BioGov.net's CoPs and provided another feedback loop for a better strategy design in Bioeconomy skills development at multiple levels. The purpose of these feedback events was to:

- Assess identified requirements for stronger bioeconomy skill integration in education
- Review the current governance system with regard to the development of bioeconomic competencies
- Review required governance changes to aid the development of bioeconomic competencies within different regions
- Discuss the impediments that may hinder the development of bioeconomic competencies
- Collate concrete measures to strengthen needed competencies and discuss incentives required to realize these measures

In Greece, the policy workshop titled "Measures for a Better Strategy Design in Bioeconomy Skills Development" took place on March 14th, 2024, at OK!Thess in Thessaloniki, Greece, organized by Q-PLAN INTERNATIONAL. The event gathered 17 stakeholders, including education providers, economic actors, policymakers, university students, and managers of the ROBIN Project. The regional policy workshop was strategically implemented within the context of the Bioeconomy Changemakers Festival-Thessaloniki edition (involving 60 participants), leveraging its dynamic atmosphere to attract more participants and, more specifically, youngsters, amplify awareness, and foster a vibrant exchange of ideas among the next generation of changemakers. The workshop aimed to address governance gaps and propose actionable measures to improve strategy design in bioeconomy skills development. Key discussions focused on aligning education with bioeconomy demands, encouraging youth engagement, and identifying challenges and opportunities. Participants proposed solutions, such as implementing work experience

programs, providing tax incentives, and certifying trainers and trainees in bioeconomy-related programs.

In Portugal, the Portuguese CoP's policy workshop was replaced by 14 one-on-one interviews. In the Netherlands the Dutch Regional Policy Workshop on bioeconomy education was replaced by interviews between May 29th and June 20th, 2024.

In Estonia the Estonian Regional Policy Workshop, was like the co-design workshops substituted by one-to-one interviews with the total of 9 participants between June and July 2024.

In Slovakia, the regional Policy Workshop, titled "BioConnect: Bridging Theory and Practice in the Bioeconomy, " took place onsite at the Faculty of Natural Sciences of Matej Bel University in Banská Bystrica, Slovakia, on June 25th, 2024. It was organized by PEDAL Consulting. The workshop aimed to address gaps in current governance systems and feedback loops for better strategy design in bioeconomy skills development. It showcased best practices from the Banská Bystrica. Participants, discussed next steps for developing bioeconomy education and identified key players for the bioeconomy Community of Practice.

In Italy, on the celebration of Italian Bioeconomy Day and ahead of the revision of the European and Italian Bioeconomy Strategies. the event was organized in collaboration with the "National Coordination Group for Bioeconomy" at the Presidency of the Council of Ministers in Rome on 24th May 2024. The event shared insights from the European Commission, CBE JU and JRC and leading projects and initiatives in bioeconomy education, such as BIObec, BioGov.net, GenB, Engage4BIO and EuBioNet, national Ministers and regional leaders, 20 policymakers discussed further steps for bioeconomy development and education. The ministries were willing to cooperate with FVA and UNIBO as experts. BioGov.net will be mentioned in the National roadmap in preparation for the updated National Bioeconomy Strategy.

The purpose of this Policy Workshop is to bring together key stakeholders from various sectors—including policymakers, for a collaborative dialogue, aiming to identify policy gaps, align educational strategies with emerging Bioeconomy needs. Through this workshop, CoP in CR seeks to inform and influence the development of policies that support the growth of a skilled workforce capable of driving sustainable Bioeconomy Education practices at all levels. In the policy workshop participated 26 people (18 education providers and 8 policy makers).

It is important to mention that the Policy workshop was organized by the BioEast Hub CR in the frame of the Thematic Working Group on Bioeconomy Education (TWG Edu) of the BIOEAST Initiative. In this workshop were participated Education stakeholders from all BIOEAST Countries and not just the Czech Republic. The outcomes of this workshop were reported to the HE-funded project Boost4BioEast. There are presented here only as a relevant information to the BioGovNet project.

In Germany, the Regional Policy Workshop, titled " The future starts now! - Promoting skills in the field of bioeconomy ", took place online on May 23rd, 2024. It was organized by WILA (WILA). The workshop aimed at reviewing current governance systems regarding the promotion of bioeconomy competences in the region. Besides assessing requirements for the integration of bioeconomy skills. It also discussed the impediments hinder-

ing the development. The event focused on the collation of concrete measures integrating bioeconomy into educational processes and highlighted the incentives that are necessary for those developments. Ten Participants discussed the next steps for developing bioeconomy education.



Figure 7: Impressions from Engagement Activities (Photo credits: FVA, Q-Plan, WILA)

4.5 Additional Engagement and Information Activities

Interviews were conducted in addition to the workshop activities or as a replacement for single workshops, to better adapt to the availability of the local Community of Practice.

By digital interviews stakeholders were able to participate in preferred timeslots. The results of the interviews were integrated into the workshop findings.

In Estonia, one-on-one interviews were organized by Civitta Eesti between June and July 2024, replacing the policy workshop.

The Portuguese CoP's policy workshop was replaced by 14 one-on-one interviews in July 2023 to compromise a low registration number. The interviews were carried out and focused on analyzing the policy environment related to the bioeconomy in Portugal. The objective was to pinpoint current deficiencies and suggest approaches for improving skill development in the bioeconomy sector within the country. Stakeholders like education providers, economic actors and policymakers participated.

As it was mentioned in the beginning, the core of the Czech CoP on Biotechnology Education I the mirror TWG on Education within the Czech BioEast Hub. As such the core is very active in organizing events, workshops seminars, participates in international events, it is partner is various HE funded projects related to Education, while is always involved in the national happenings considered as a key player on Bioeconomy Education within the country.

In the Netherlands, eight interviews were carried out between May 29 and June 20, 2024, replacing the policy workshop. Stakeholders from the bioeconomy sectors like education providers, economic actors and policymakers (triple helix) were involved. The interviews addressed gaps in the current governance systems and tried to outline the design of bioeconomy skill development. Guidelines and next steps were addressed. The stakeholders considered cooperation and communication as key factors besides intrinsic motivation and financial support. A combination of long-term goals and short-term action was seen as beneficial. Also,

In Germany additional eight stakeholders were involved in designing and assessment activities through interviews. They were addressed during events on bioeconomy and contacted via e-mail and phone calls. Those actions were taken because of registration for the Co-Design Workshops. The results of the interviews were integrated into the outcome of the Co-Design workshops.

Another means of initiating additional engagement was the connection to larger events. Co-creation workshops were realized in combination with an event of a partner project, or in the context of larger events such as the Bioeconomy Changemakers Festival-satellite events, the "[European Vocational Skills Week 2023](#)" or the "Planetiers World Gatherings 2023" in Portugal.

5 Barriers encountered

Barriers encountered address two different aspects: Barriers for an improved or intensified bioeconomy and the related educational efforts and barriers encountered when engaging with the regional or national stakeholders.

Discussions started by describing national needs, e.g. in Estonia, participants emphasized the necessity to acquire more knowledge, practical experience and technical skills. In Germany, participants stressed the necessity of practical experiences and development of technical skills, as well as the use of open-source learning methods. In Slovakia, emphasis was put on incorporating practical experiences into education through collaborations among stakeholders to foster lifelong informal education, particularly for different age groups and disadvantaged or vulnerable groups, ensuring education is accessible and adaptable to all.

In Estonia and Germany, participants faced challenges due to a lack of information, awareness and knowledge, and little awareness and interest led to low engagement. In addition, a certain reluctance to learn, a lack of information on the importance of education, prejudices, and fear of failure have been mentioned as barriers. Organizational barriers included a lack of funds, marketing strategies, and quality lecturers. Organizational barriers included a lack of research, innovation and engineering skills.

In Greece, one of the main barriers encountered was the difficulty in recruiting stakeholders, particularly public authorities, industry representatives, and VET stakeholders. To overcome this, Q-PLAN encouraged participants to spread the word to their colleagues and networks, leveraging word-of-mouth recommendations, which concluded in success. Another challenge was ensuring effective communication and engagement during hybrid events, which was addressed by improving sound quality and providing more time for discussions.

Also, in Portugal, companies were difficult to address and to have them participating in meetings. The biggest challenge faced by the Portuguese CoP was the notable absence of participants from critical sectors, particularly in policy and administration, as well as the industry. Encouraging the engagement of stakeholders from these domains has proven to be quite challenging.

In Italy, BioGov.net was recognized as highly relevant for the update of the National strategy and will be mentioned in the National roadmap in preparation for the updated National Bioeconomy Strategy. It is not easy to combine the art dimension, marginalized groups and bioeconomy. In the Netherlands Participants faced challenges such lack of funds, marketing strategies and quality lecturers.

In the Czech Republic several barriers were encountered in various levels during these workshops. We can mention the more significant ones as follows: 1) Critical gaps in curricula, outreach, and engagement strategies 2) lack of awareness, 3) lack of supportive policies, 4) not enough industry involvement, 5) Little awareness and interest 6/ Irrational prioritization of learning pathways including vocational learners. Due to the heterogeneity of the barriers, the mitigation strategies are not universal and they have to be decided and adopted on a case-by-case basis.

In Germany, addressing the CoP members was challenging. Formats were changed from on-site events to online events and supplemented by individual interviews. Low participation from regional stakeholders can be explained by a certain stakeholder fatigue. On the other hand, certain demarcation tendencies of central actors, following their project ideas, were observed and led to missing commitment. Explanations given were, besides others, a high number of bioeconomy projects in the region and a related high workload of stakeholders. The opinion of not being able to contribute to a meta level (educational framework) and unfortunately also the impression of being a competitor in the region more than a partner addressing the same goals. The first resonance of the recruited group was high, but participation in actions (meetings' surveys) and providing consent remained low. Especially, companies were not able to attend or answer questions and declared a lack of time. The initiatives and organizations that were already active in the region also refrained from participating in activities of the project. To compensate for the limited feedback and participation, people were asked to take part in surveys. To improve participation and input additional individual interviews have been set up.

6 Lessons learned

What? Stakeholder Engagement!

In general, it was stated that the "Design Thinking" method proved to be effective in engaging participants and fostering interactive discussions. It ensured that every participant contributed, leading to a rich exchange of ideas. Engaging a diverse range of stakeholders, including academia, public authorities, Arts and Creativity Organisations, industry representatives, and VET stakeholders, was experienced as crucial but challenging. For future activities. It is recommended to allocate more participants by pointing out that bioeconomy can help to drive solutions for environmental problems forward.

In Estonia, new formats like panel discussion and field trips to engage the audience were explored. Initially, proposed co-creation workshops did not work in our region. Main selling points were novel formats and networking opportunities, but also the involvement of blue economy enthusiasts who want to contribute to the development of this sector. The co-design and policy workshop was substituted by one-on-one interviews.

In Greece, the sequence of activities worked well, but adding more interactive and hands-on sessions could enhance engagement. We would also consider integrating more digital tools to facilitate remote participation. For future activities, leveraging personal networks and word-of-mouth to recruit participants is highly recommended. The Italian partners emphasized that supporting tools carefully designed beforehand (e.g. MENTIMETER and MIRO) are proven to be effective in stimulating the debate and collecting relevant input.

In Portugal, the European partnership triggered the participation of local stakeholders. The collaboration with a local organization (B2E coLAB) was crucial for the successful implementation of the project activities. However, some planned workshops did not attract the necessary participation for a successful co-creation process, leading to opt for one-on-one interviews instead. One significant factor that hindered participation in the workshop was the timing; organizing such an event during the summer in Portugal made it challenging to gather the required number of participants.

In Italy, partnership with local organisations was key, especially for the success of the online meetings. Additionally, adopting a macro-regional approach proved to be more effective than focusing solely on regional or local levels, as it allowed for broader impact and coherence. Involving technical experts—e.g. those directly responsible for drafting regional and national bioeconomy strategies—was essential to guarantee the integration of project assets into policymaking. Finally, providing ready-to-use, aggregated materials and preliminary project's results was highly valued for validating and co-creating the final CoP outcomes.

In the Czech Republic involving stakeholders directly in the design process increased their sense of ownership and motivation to contribute to future actions. This results to a more active participation of the stakeholders in all phases and processes.

In the Netherlands. The interaction and cooperation between members of the triple helix were considered a key element/ necessary. It was beneficial to include expert partici-

pants for the policy interviews, as they could relate much faster to mentioned bioeconomy aspects. For interviews. The semi-structured interview was chosen as an event format, which allowed going into more detail.

In Germany, for future activities. It is recommended to spend more time on addressing the stakeholders before inviting them to events. More time for inviting participants is equally important. Keeping stakeholders well informed and using interactive methods to maintain high levels of engagement are further recommendations. The sequence of the formats suited the project progress well. The "Design Thinking" methodology was experienced as a highly effective method to engage participants in future-oriented thinking and to achieve active discussions. Low participation in some events was substituted by additional interviews, too.

So what? Designing formats to animate discussions!

Engaging formats such as exchange on job profiles and case studies were not enough to keep the audience interested. Additional implementation of panel discussion helped maintain stakeholder engagement and provide practical insights. It was also beneficial to include business training courses and field trips to companies that work in the field of bioeconomy, making use of products and materials enhancing the various aspects of bioeconomy. Future workshops should incorporate these aspects as described above, Design Thinking and interactive formats utilizing online resources, e.g. as MIRO Boards, were highly effective in animating the discussions. Working with job profiles, case studies, and videos helped to visualize future scenarios. Providing pre-workshop materials to help participants prepare should be considered. On-site Workshops offer a multitude of discussions and debates. Smaller groups allow individual topics. The Mural approach and other tools as used in the online format of the Co-design workshop, are quite helpful. Mural creates many ideas and remarks per topic, which do not always align with each other. A pre-prepared Mural canvas helped to structure the discussion and ensure that all relevant topics were addressed. Interviews were able to gather in-depth information. It can be more effective to organize workshops in conjunction with another event to maximize participant attendance. Another highly successful approach has been the establishment of strategic partnerships with relevant organizations. The Portuguese CoP has cultivated a strong and productive relationship with an organisation that already has garnered recognition and support from a diverse range of stakeholders.

While one-on-one interviews may lack the cooperative, co-creative, and networking opportunities of an onsite meeting. They are well-suited for detailed information exchange and can encourage participants to voice their opinions more freely. When organizing events, especially for marginalized groups but also for participants or company representatives from a broader distance, travel support should be considered. For example, in Estonia blue bioeconomy actors are often located on the coast and islands. They might not be motivated to travel from these locations for a half-day on-site event. The use of tools such as "Mind Mapping" and "How Might We" questions proved effective in animating discussions and generating creative ideas. However, ensuring all participants are familiar with these methodologies beforehand could improve efficiency. If the main objective is to inspire and inform the audience, dedicate sufficient time for case study presentations with brief pitches (e.g. the "buffet of ideas" implemented in the Italian CoP workshops), including BioGov.net methodology to link art and bioeconomy education.

Inviting the stakeholders and speakers to a “buffet of ideas” ensures their presence in the following open debate. Having European high-level speakers was key to attract relevant Italian policy makers since they are interested in seeing the connection with their work and the EU strategies. In Greece. The importance of flexibility in planning and execution was highlighted. Being able to adapt to participants' needs and feedback in real-time was crucial for the success of the workshops. The integrating elements of creativity and art into the discussions helped to make the sessions more engaging and accessible to a wider audience.

Also, in Italy, continuous evaluation and adaptation were seen to be the key factor, as well as being flexible and open to call on stage additional participants to share interesting case studies. Keep an informal atmosphere by stimulating questions from the participants and facilitating networking during lunch and coffee breaks. Working with “technical” people, e.g. the ones that are writing the bioeconomy strategies in the region, is favourable, to make sure the project's assets will be integrated into policymaking.

For the Czech Republic it was stated that methodologies and interactive formats by means of online resources are very effective to animate the discussions. Including case studies and videos is essential in visualization and in scenarios making. Finally, it is very important to create pre-workshop information and to give it to stakeholders. This allows then to improve their understanding and to feel more comfortable.

Now what?

Recognize the importance of ongoing cooperation between companies and educational institutions. A SWOT analysis in the beginning, during the setup of the focus group, can help to focus on strengths and mitigate weaknesses

In Estonia, it is recommended to organize the workshops in conjunction with another event to allow for the maximum number of participants. However, in a small country. These in-person events need to be planned well ahead, as on a specific topic, written information is helpful to inform attendees. While organizing one-on-one interviews instead of an onsite meeting does not allow much cooperation, co-creation and networking, it functions properly for detailed information exchange, and people (e.g. policymakers) can be encouraged to voice their opinion more. This is even more so as the blue bioeconomy is not too much integrated into Estonian policy.

The Czech Partner, ART, summarized several issues and topics should be taken in consideration:

- **Ongoing Stakeholder Engagement is Essential:** Successful Bioeconomy education initiatives require the continuous involvement of diverse stakeholders from the beginning
- **Building a Shared Vocabulary is Crucial:** Clarifying key concepts (e.g., Bioeconomy, circular economy, sustainability) early on helps prevent miscommunication and aligns diverse stakeholder groups toward common goals
- **Focus on Practical, Action-Oriented Outcomes:** Stakeholders highly value the production of concrete frameworks, tools, and actionable plans
- **Sustaining Communities of Practice** requires dedicated resources
- **Cross-sector Collaboration** is a key driver.

7 Future Needs and Demands identified

In Estonia participants identified the need for expansion of (bio-)economic sectors (aquaculture, wind farming). Increasing knowledge, better information. The development of research and fields of study along bioeconomy sectors were seen as key factors.

For Greece, a continued exploration of innovative approaches to stakeholder engagement and education is sought. Needs for the future, as identified by the CoP, revolve around integrating circular economy into university curricula, engaging youth in practical initiatives such as summer schools, strengthening vocational orientation from high school, fostering connections between universities and the job market, facilitating community-level volunteer initiatives for environmental awareness. Most of the discussions centered around the crucial need to identify measures to improve the current governance system to better strategise bioeconomy skills development. Last but not least, there was a strong emphasis on integrating marginalized groups, women, and university students into emerging job opportunities.

In Portugal, there is a need for training, especially on blue bioeconomy and a collection of good practices. Lack of adequate funding and innovation, of knowledge sharing, and of communication between industry and research contribute to a low awareness. A collaboration with chambers of commerce was seen as essential. This alliance would facilitate the incorporation of bioeconomy principles into industrial practices. It is crucial to establish work experience programs for high school and university students, along with certification opportunities. The emphasis on practical experiences and the need for curricula was outlined. Key factors for promoting bioeconomy education were identified as enhanced funding, integration of companies, adequate network, new curricula in alignment with sustainability, and more content development. Educational programs remain a pressing concern in Portugal.

In Slovakia, participants identified the need to modernize learning methods and emphasize practical experience. They also highlighted the need to update the curriculum and engage in strategic policy influencing. The importance of continuously evaluating educational approaches and the willingness to adapt methodologies based on emerging trends and needs within the bioeconomy sector was highlighted. Incentives, recognition programs, and opportunities for professional growth should be included. The importance of ongoing professional development for educators and an encouragement for peer-to-peer education, interactions with researchers.

In Italy, stakeholders highlighted that Bioeconomy education must be interdisciplinary, locally grounded, and aligned with industry needs. This requires collaboration across sectors, informed policy and training strategies, and inclusion in regional priorities. Strengthening networks among education providers, policy actors, and stakeholders—following models like COVEs and BIObec—can enhance training at all levels. Ecosystem facilitators and connectors are considered to be necessary for the transition/education. Arts-based approaches were recognised by all stakeholders as relevant in fostering inclusion and transversal skills, but further work is needed to develop structured educational pathways. Economic incentives and support from non-traditional educational actors (e.g. clusters, professional associations, museums, local libraries) can also play a key role in promoting green jobs and engaging learners.

In the Czech Republic participants in the workshops had various requirements and needs identified. However, based on the rationale developed behind them the needs and demands were prioritized as follows: 1) There is a necessity for cooperation between the actors involved in the education but also between education and private sector in the sense of vocational training. 2) An inclusion of the Education in Policies and Strategies focusing on the wider Bioeconomy perspective is needed. 3) It needs enhancement of the awareness and understanding of the end users using a wide spectrum of tools and media. 4) Additional funding opportunities especially from the private sector are much appreciated.

In the Netherlands, it was emphasized that there was a need for different types of certifications. There are no certification systems available for on-the-job training and for open-source education. In Greece, future needs identified include the development of more comprehensive and flexible educational programs that align with bioeconomy job profiles and address the specific needs of marginalized groups. There is also a demand for increased funding and support for bioeconomy education, as well as the creation of regional hubs and collaborative schemes to enhance stakeholder engagement. In the Netherlands, participants saw the need for tailored trainings for different target groups, e.g. for employees, upskilling was favoured. To address a general audience substantial guidance was requested.

In Germany, participants identified the necessity of modern learning methodology and emphasize practical learning experience. Furthermore, participants named the lack of an educational strategy and governance models at a regional/national level, insufficient funding opportunities and too little public awareness as the biggest impediments. From the German perspective. It is important to assess educational strategies regularly. Modifying methods in response to new trends and requirements in the bioeconomy sector is important. It needs motivational structures for both educators and students to promote the pursuit of studies in bioeconomy. This could involve implementing incentives, establishing recognition programs, and providing opportunities for professional development. The significance of continuous professional development for educators must be acknowledged. Promote peer-to-peer learning, foster interactions with researchers and entrepreneurs, and support ongoing education to broaden their perspectives and enhance their teaching practices. For future activities, more communication measures and collaborative projects should be considered as part of job orientation initiatives, e.g. for the communication of exhibits, competitions, prizes, etc.

In addition, it was suggested to increase practical experiences by enlarging the number of internships and the involvement of students in research activities. Targeted communication measures should lead to a closer alignment of research, production and consumers and to the integration of marginalized groups.

Recommendations include promoting interdisciplinary curricula, offering practical experience through internships, and ensuring accessibility and inclusivity in education pathways. A brief overview is given in Figures 7 and 8.



Figure 8: Quotes and brief overview on results from Estonia, Italy, Greece and Germany



Figure 9: Quotes and brief overview on results from the Netherlands, Portugal, Slovakia and the Czech Republic

8 Appendix: Implemented CoP Engagement Activities per Country

ESTONIA

Partner/Organisation	Civitta Eesti
CoP country	Estonia
CoP size	26

Focus Groups

The focus group took place onsite on June 8th, 2023, organized by Civitta Eesti. The focus group aimed at setting up a governance model supporting bioeconomy development in the region. It focused on skills, validated case studies, and the relevance for the Estonian blue economy sector.

It introduced the possible involvement of art and marginalized groups. There were 6 participants, mainly economic actors (blue economy sector) and education providers. The most relevant sector is aquaculture, together with aligned areas (offshore farming). Skills and knowledge on Engineering and technologies in the blue (bio)economy are insufficient.

Co-Creation workshops

The co-creation workshop took place onsite and online on November 13th, and 16th, 2023, with eight participants, organized by Civitta Eesti. The workshop focused on building competences and necessary skills for the blue bioeconomy, engaging learners in the blue economy and drafting corresponding recommendations. It aimed to initiate further discussion on the key competences and the integration of art in collaboration with natural sciences and industry. Making technical engineering more popular by means of raising awareness and training was identified as an important target, Estonia has many unused opportunities in blue bioeconomy (aquaculture, wind power) due to a lack of knowledge, research & innovation and curriculum for specific blue economy fields. Protected areas are seen as a barrier for the blue bioeconomy.

Co-Design workshops

There were no co-design workshops, organized by Civitta Eesti. Instead, additional interviews were being held (see later in the text).

Policy workshops
The Estonian Regional Policy Workshop was like the co-design workshops substituted by one and one interviews with the total of 9 participants, between June/July 2024. See additional engagement.
Additional engagement and information activities
One-on-one interviews were organized by Civitta Eesti between June/July 2024. They were conducted to gain insights on the blue bioeconomy- education and -related policies. They gave insight how to implement education to fill the gaps in current and future blue bioeconomy skills and needs. Participants discussed next steps for developing bioeconomy education.

Country specifics and identified barriers

Country / CoP specifics
There were two workshops that took place in Estonia (focus group and co-creation workshop). Main formats were brainstorming, panel discussion and field trip. Participants emphasized the necessity to acquire more knowledge, practical experience and technical skills.
Barriers encountered and mitigation measures applied
Participants faced challenges lack of information and knowledge. Organizational barriers included lack of research, innovation and engineering skills.
Future Needs and demands identified
Participants identified the need for expansion of economic sectors (aquaculture, wind-farming). The increase of knowledge and information. The development of research and fields of study were seen as key factors.

Lessons learned and future recommendations

Stakeholder Engagement
We had to explore new formats (like panel discussion and field trip) to engage the audience. Initially proposed co-creation workshops did not work in our region. Main selling points are novel formats and networking opportunities, but also blue economy enthusiasts who want to contribute to the development of the blue economy. Conversely, we had to explore new formats (like panel discussions and field trips) to engage the audience. Initially proposed co-creation workshops did not work in our region. We had to cancel the initial workshop as interest in participation was very low, and come up with new formats. We had to substitute the co-design and policy workshop with one-on-one interviews, nine people participated three education providers and six policymakers.

Recommendations: For future activities. It is recommended to allocate more participants by pointing out that bioeconomy can help to drive things forward.

Design of formats to animate discussions

What we learned: Interactive formats such as exchange on job profiles and case studies were not enough to keep the audience interested. Additional implementation of panel discussion and field trips help to maintain stakeholder engagement.

Recommendations: Future workshops should incorporate these aspects as described above. When organizing events, especially for marginalized groups or bioeconomy online events or travel support should be considered. For example, in Estonia blue bioeconomy actors are often located on the coast and islands. They might not be motivated to travel from these locations for a half-day on-site event.

Making sure outcomes are meaningful

What we learned: The additional use of one-on-one interviews helped to complement the input.

Recommendations: Use these methods to gather valuable insights and develop practical solutions. Small circles create an atmosphere for participants to also share their experience among each other and to find future collaboration opportunities.

Keeping the group engaged over a certain time span

What we learned: We had to explore new formats (like panel discussion and field trip) to engage the audience. We had to cancel the initial workshops as interest in participation was very low, and conduct interviews instead.

Recommendations: Come up with new formats like one-on-one interviews, that allow good insights in policy recommendation and helped to maintain interest.

Anything else?

It is recommended to organize the workshops in conjunction with another event to allow for the maximum number of participants. However, in a small country. These in-person events need to be planned well ahead, as for a specific topic, written information is helpful to inform attendees. While organizing one-on-one interviews instead of an onsite meeting does not allow much cooperation, co-creation and networking. It functions properly for detailed information exchange, and people (e.g. policymakers) can be encouraged to voice their opinion more. This is even more so as the blue bioeconomy is not too much integrated into Estonian policy.

GREECE

Partner/Organisation	Q-PLAN INTERNATIONAL
CoP country	Greece
CoP size	33 External (+4 Q-PLAN Members)

Focus Groups

The focus group took place on May 29, 2023, organized by Q-PLAN INTERNATIONAL. The event aimed to explore challenges in bioeconomy education in Greece and discuss innovative approaches using art and creativity. There were 14 participants, including education providers, economic actors, policymakers, and representatives from the arts and wider society. Key discussions included defining bioeconomy, contributions to bioeconomy, existing educational programs, and connecting bioeconomy with art and marginalized groups. Good practices were shared and new ideas for adult education in bioeconomy were developed. The main insights were the lack of educational programs and communication skills in the bioeconomy sector in Greece. Participants suggested improving synergies between educational programs and industries and increasing citizen awareness. The event highlighted the need to involve more public authorities, industry representatives, and VET stakeholders in the Greek Community of Practice and to promote future events.

Co-Creation workshops

The co-creation workshop titled "Education in Bioeconomy – Overview of relevant bioeconomy job profiles" took place on July 18, 2023, at OK!Thess in Thessaloniki, Greece, organized by Q-PLAN INTERNATIONAL. The workshop focused on educational priorities and training needs within Greece, particularly in the bioeconomy sector.

The event gathered 11 participants, including education providers, economic actors, policymakers, and representatives from marginalized groups. The workshop aimed to discuss the needs for new competences and skills for professions in the bioeconomy and the development of adequate educational programs. Participants reviewed 20 prioritized bioeconomy job profiles and identified skill gaps, emphasizing the inclusion of marginalized groups in these job profiles.

Key discussions included improving educational governance for bioeconomy, setting development priorities for 2025 and 2030, and implementing actions to achieve these goals. The workshop also explored how creativity and art can contribute to the coexistence of different social groups and the development of new educational models.

Co-Design workshops

Two co-design workshops were held to develop educational pathways in bioeconomy. The first workshop, titled "Educational Pathways in Bioeconomy – Needs of Learners Regarding Training in Bioeconomy." took place on October 18, 2023, at OK!Thess in

Thessaloniki, Greece. Organized by Q-PLAN INTERNATIONAL, this workshop aimed to identify deficiencies in bioeconomy-related education and address the needs of trainees for new programs, learning styles, and actions in education. The event gathered 14 participants from various sectors, including education providers, economic actors, policymakers, and representatives from the arts and wider society.

The second workshop, titled "Educational Pathways in Bioeconomy – Directions for Training Providers and Decision-Makers" was held on November 7, 2023, also at OK!Thess in Thessaloniki. This workshop aimed to develop effective educational programs for adults in bioeconomy, addressing current gaps in education and policy. It gathered 16 participants, including representatives from research and educational institutions, vocational training organizations, local governments, public agencies, industry stakeholders, NGOs, and the arts sector.

Policy workshops

The policy workshop titled "Measures for a Better Strategy Design in Bioeconomy Skills Development" took place on March 14, 2024, at OK!Thess in Thessaloniki, Greece in the context of Bioeconomy Changemakers Festival-Thessaloniki edition organized by Q-PLAN INTERNATIONAL. The policy workshop gathered 17 stakeholders, including education providers, economic actors, policymakers, university students, and managers of the ROBIN Project. The workshop aimed to address governance gaps and propose actionable measures to improve strategy design in bioeconomy skills development. Key discussions focused on aligning education with bioeconomy demands, encouraging youth engagement, and identifying challenges and opportunities. Participants used interactive methods to propose solutions, such as implementing work experience programs, providing tax incentives, and certifying trainers and trainees in bioeconomy-related programs,

Additional engagement and information activities

Country specifics and identified barriers

Country / CoP specifics

In the Greek Community of Practice (CoP). The implementation of activities included a strong focus on integrating art and creativity into bioeconomy education, which stood out as a unique approach. The use of methodologies like "Mind Mapping" and "How Might We" questions facilitated structured innovation and creative problem-solving. Additionally, the emphasis on involving marginalized groups in bioeconomy job profiles and educational programs was a notable aspect that should not be missed

Barriers encountered and mitigation measures applied

One of the main barriers encountered was the difficulty in recruiting stakeholders, particularly public authorities, industry representatives, and VET stakeholders. To overcome this, Q-PLAN encouraged participants to spread the word to their colleagues

and networks, leveraging word-of-mouth recommendations. Another challenge was ensuring effective communication and engagement during hybrid events, which was addressed by improving sound quality and providing more time for discussions.

Future Needs and demands identified

Future needs identified for the Greek CoP include the development of more comprehensive and flexible educational programs that align with bioeconomy job profiles and address the specific needs of marginalized groups. There is also a demand for increased funding and support for bioeconomy education, as well as the creation of regional hubs and collaborative schemes to enhance stakeholder engagement. Recommendations include promoting interdisciplinary curricula, offering practical experience through internships, and ensuring accessibility and inclusivity in education pathways.

Lessons learned and future recommendations

Stakeholder Engagement

In working with the Greek Community of Practice (CoP), we learned that engaging a diverse range of stakeholders, including public authorities, industry representatives, and VET stakeholders, is crucial but challenging. For future activities, we recommend leveraging personal networks and word-of-mouth to recruit participants.

Recommendations: The sequence of activities worked well, but adding more interactive and hands-on sessions could enhance engagement. We would also consider integrating more digital tools to facilitate remote participation.

Design of formats to animate discussions

The use of "Mind Mapping" and "How Might We" questions proved effective in animating discussions and generating creative ideas. However, ensuring all participants are familiar with these methodologies beforehand could improve efficiency.

Recommendations: Next time, we would provide pre-workshop materials to help participants prepare. The formats that worked best were those that encouraged active participation and visual engagement, such as interactive diagrams and sticky notes.

Making sure outcomes are meaningful

To ensure meaningful outcomes, we focused on clear goal-setting and continuous feedback. We used structured methodologies to guide discussions and capture insights systematically. Regular follow-ups and feedback questionnaires helped us refine our approach and ensure that the activities met their objectives. Aligning the outcomes with the broader goals of the BioGov.net project was essential.

Keeping the group engaged over a certain time span

We kept the group engaged by maintaining regular communication through emails and social media updates. Providing clear agendas and objectives for each session helped

participants stay focused. We also encouraged networking and collaboration among participants, which fostered a sense of community. These measures were successful in maintaining engagement over time.

Anything else?

One additional reflection is the importance of flexibility in planning and execution. Being able to adapt to participants' needs and feedback in real-time was crucial for the success of the workshops. We also found that integrating elements of creativity and art into the discussions helped to make the sessions more engaging and accessible to a wider audience. Recommendations: For future activities, we recommend continuing to explore innovative approaches to stakeholder engagement and education.

PORTUGAL

Partner/Organisation	LOBA
CoP country	Portugal
CoP size	33

Focus Groups

The focus group took place onsite on June 21, 2023, organized by LOBA in partnership with B2E coLAB – Blue Bioeconomy Colab. The event site was the Associação Nacional de Jovens Empresários in Porto. The event was organized in the context of the Portuguese Local CoP independent event, 13 participants, mainly education providers and economic actors attended the workshop. The focus group aimed to develop perspectives concerning a transition to a sustainable bioeconomy with special focus on education.

Co-Creation workshops

The co-creation workshop took place online on October 10, 2023, organized by LOBA. It focused on educational priorities and training needs within Portugal. The workshop with 10 participants from mainly education providers and economic actors aimed at discussing the needs for new competences and skills for professions in the bioeconomy and the adequate educational programs. Aspects on how to include marginalized groups was integrated in the Job profiles.

Co-Design workshops

Two co-design workshops took place online on October 10, 2023, and on-site on 30/10/2023, organized by LOBA. The second workshop was conducted by interviews (questionnaire) in the event Planetiers World Gatherings 2023 that took place from 29-31 October in Portugal, Aveiro, 13 people attended in online meeting and gave insight in interviews, mainly education providers and economic actors. Both formats

aimed to gather valuable insights and perspectives from participants regarding the priorities of education and the skills and training needs related to the bioeconomy in Portugal. The Co-design formats wanted to foster a collaborative discussion among the attendees and scope future activities of the Community of Practice. Besides the insights already gained at the co-creation workshop. They discussed improvement on Education Governance in education and training, and the tools, strategies, and Actions.

Policy workshops

The Portuguese CoP Policy Workshop was replaced by 1three one-on-one interviews (see add, engagement.

Additional engagement and information activities

The Portuguese CoP Policy Workshop was replaced by 14 one-on-one interviews in July 2023. The planned workshop did not attract the necessary participation for a successful co-creation process, leading us to opt for one-on-one interviews instead.

The interviews were carried out and focused on analyzing the policy environment related to the bioeconomy in Portugal. The objective was to pinpoint current deficiencies and suggest approaches for improving skill development in the bioeconomy sector within the country, Stakeholders like education providers, economic actors and policy-makers participated.

Country specifics and identified barriers

Country / CoP specifics

Focus :The first CoP activity included representatives from different target groups, and this ensured that different views were expressed (education, research, politics, industry, business etc,). A regional swot concluded that the region has high bio-resource availability but faces challenges like low bioeconomy literacy, inadequate funding, and poor industry-research communication. Opportunities include job creation in rural areas and innovative awareness methods, while threats involve sector neglect and resistance to innovation.

The size in combination with the variety of the group made the focus group an easy activity and ensured that all views/opinions were expressed heard, and discussed.

The atmosphere was informal and accessible, which facilitated communication. We also made time for two coffee breaks to allow networking and more informal moments, Combining different work forms in a session leads to fruitful discussions. The co-creation workshop was online. The acceptance of the digital workshop was higher than with on site events, offering easy participation. The Cocreation workshop made use of MIRO, which enabled interaction and col-

laboration among participants, ensuring engagement. The disadvantage of digital meetings can be less intuitive for fostering networking. Online events can be fostered by inviting a larger audience, because registration might be higher than participation. The online event showed the importance of diversity among the attendees. Important factors are well-planned ahead planning and a high number of invitations being sent out.

Barriers encountered and mitigation measures applied

Companies were difficult to address and to integrate into those meetings. The biggest challenge faced by the Portuguese CoP was the notable absence of participants from critical sectors, particularly in policy and administration, as well as the industry. Encouraging the engagement of stakeholders from these domains has proven to be quite challenging. Involving all the participants and speakers ensures a strong collaboration on the discussions. In the meetings. There is a high need to be flexible and adjust the program based on momentary needs.

Future Needs and demands identified

Despite the fact that there are numerous universities. There is a need for training, especially on blue bioeconomy and a collection of good practices. Lack of adequate funding and innovation, of knowledge sharing, and communication between industry and research contribute to a low awareness. Outcomes were that collaboration with chambers of commerce is essential. This alliance would facilitate the incorporation of bioeconomy principles into industrial practices. It is crucial to establish work experience programs for high school and university students, along with certification opportunities. The emphasis on practical experiences and the need for curricula was outlined. Key factors for promoting bioeconomy education was identified as enhanced funding, integration of companies, adequate network, new curricula in alignment with sustainability, and more content development.

Educational programs remain a pressing concern in Portugal, Existing programs have to be supported new ones have to be developed.

Lessons learned and future recommendations

Stakeholder Engagement

What we learned:

The partnership triggered the participation of local stakeholders

Partnership with a local organization (B2E coLAB) was crucial for successful implementation.

However, some planned workshops did not attract the necessary participation for a successful co-creation process, leading us to opt for one-on-one interviews instead.

One significant factor that hindered participation in the workshop was the timing; organizing such an event during the summer in Portugal made it challenging to gather the required number of participants.

Recommendations: For future activities. It is recommended to allocate more time for inviting participants to ensure a diverse and representative group.

Design of formats to animate discussions

What we learned:

It is more effective to organize workshops in conjunction with another event to maximize participant attendance. While one-on-one interviews may lack the cooperative, co-creative, and networking opportunities of an onsite meeting. They are well-suited for detailed information exchange and can encourage participants to voice their opinions more freely.

Recommendations:

A highly successful approach has been the establishment of strategic partnerships with relevant organizations. The Portuguese CoP has cultivated a strong and productive relationship with B2E coLAB, a collaboration that has garnered recognition and support from a diverse range of stakeholders.

Making sure outcomes are meaningful

What we learned: The implementation of empathetic interviews made sure that the results of the activities were significant and in line with the workshop's objectives.

Recommendations: Enough time should be allocated for online meetings

Keeping the group engaged over a certain time span

What we learned: During the meetings. It is crucial to remain adaptable and modify the agenda according to immediate requirements.

Recommendations: Frequent breaks and a mix of activities can also aid in sustaining energy and engagement during meetings of all kinds. Keeping people well informed throughout the invitation process is crucial.

Anything else?

A SWOT analysis in the beginning during the set-up of the focus group can help to focus on strengths and mitigate weaknesses throughout the process.

SLOVAKIA

Partner/Organisation	PEDAL Consulting
CoP country	Slovakia
CoP size	74

Focus Groups

The focus group titled "How to build competences and specific skills for the bioeconomy in the regions?" was organized by Pedal Consulting and held online via Zoom on June 13, 2023. The event aimed to develop a regional governance model supporting bioeconomy development and engage potential Community of Practice members. The focus was on lifelong learning in bioeconomy, innovative educational models, and the involvement of vulnerable, marginalized groups. The workshop included presentations and discussions to validate case studies, identify regional needs and priorities, and target beneficiaries.

Co-Creation workshops

The co-creation workshop titled "How to build competences and necessary skills for the bioeconomy in the regions?" was organized by PEDAL Consulting and held online on October 13, 2023. The workshop aimed to initiate a discussion on the need for new competences and skills for professions in the bioeconomy and educational programmes ensuring their development. Objectives included summarizing bioeconomy priorities for Slovakia, identifying key professions and related competences and skills, and discussing models of educational programmes. The event included presentations and discussions facilitated through a MIRO Board and had 21 participants from various sectors.

Co-Design workshops

First Co-Design Workshop

The first co-design workshop titled "Innovative forms of education for future skills in bioeconomy" was organized by PEDAL Consulting and held online on October 24, 2023. The workshop focused on connecting formal and informal education with future skills for job profiles in the bioeconomy using the "Design thinking" method. The challenge addressed was "How to create educational content to match the future or existing job positions in the bioeconomy?" Participants developed the main challenge to "How could we help education providers adapt education to the current and future needs of the labour market so that graduates can be more successful in finding a job after graduation?" The event had eight participants from various sectors.

Second Co-Design Workshop

The second co-design workshop titled "Innovative forms of education for future skills in bioeconomy" was organized by PEDAL Consulting and held online on November 3, 2023. The workshop continued the focus on connecting education with future skills for job profiles in the bioeconomy. The primary objective was to conceptualize a tangible format aimed at infusing practical experience into education. Participants self-selected into two groups: "Practice-oriented Learning for Students in Vocational Education and Training" and "Development of Lifelong Informal Education and Adaptation to Different Age Categories or Disadvantaged/Vulnerable Groups of People." The event had 9 participants from various sectors.

Policy workshops

The Slovak CoP Regional Policy Workshop, titled "BioConnect: Bridging Theory and Practice in the Bioeconomy," took place onsite at the Faculty of Natural Sciences of Matej Bel University in Banská Bystrica, Slovakia, on June 25, 2024. It was organized by Jana Bielikova and Adriana Ciefova from PEDAL Consulting. The workshop aimed to address gaps in current governance systems and feedback loops for better strategy design in bioeconomy skills development. It showcased best practices from the Banská Bystrica region and fostered collaboration in the bioeconomy sector. The event focused on integrating bioeconomy into educational processes and creating new opportunities in this field. Participants discussed next steps for developing bioeconomy education and identified key players for the bioeconomy community of practice.

Additional engagement and information activities

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Country specifics and identified barriers

Country / CoP specifics

Detailed SWOT analysis of the Zilina region from a workshop held on May 5, 2023, Integration of Practical Experience: Emphasis is placed on incorporating practical experiences into education through collaborations with researchers, businesses, and stakeholders.

Innovative Teaching Methods: The use of "Design thinking" and other interactive formats such as virtual reality and educational videos.

Focus on Lifelong Learning: There is a strong emphasis on lifelong informal education, particularly for different age categories and disadvantaged or vulnerable groups, ensuring education is accessible and adaptable to all.

Community and Stakeholder Engagement: Active participation from a wide range of stakeholders, including education providers, economic actors, policymakers, and representatives from the wider society, ensures that educational programs are well-rounded and meet community needs.

Barriers encountered and mitigation measures applied

Participants faced challenges such as reluctance to learn, lack of information on the importance of education, prejudices, and fear of failure. Organizational barriers included the lack of funds, marketing strategies, and quality lecturers.

It is crucial to adjust activities and language used to make them more appealing. Hands-on activities in non-traditional environments can help engage participants.

Future Needs and demands identified

Participants identified the need to modernize learning methods and emphasize practical experience. They also highlighted the need to update the curriculum and engage in strategic policy influencing,

Lessons learned and future recommendations

Stakeholder Engagement

What we learned: The "Design Thinking" method proved effective in engaging participants and fostering active discussions. It ensured that every participant contributed leading to a rich exchange of ideas.

Recommendations: For future activities. It is recommended to allocate more time for inviting participants to ensure a diverse and representative group. Additionally, consider using interactive methods like "Design Thinking" to maintain high levels of engagement.

Design of formats to animate discussions

What we learned: Interactive educational formats such as virtual reality, online resources, and case studies were particularly effective in animating discussions and keeping participants engaged.

Recommendations: Future workshops should incorporate these interactive elements to enhance participant engagement. It is also beneficial to include business training courses and visits to bioeconomy producers to provide practical insights.

Making sure outcomes are meaningful

What we learned: The use of empathetic interviews and the development of prototypes helped ensure that the outcomes of the activities were meaningful and aligned with the goals of the workshop.

Recommendations: Continue using these methods to gather valuable insights and develop practical solutions. Ensure that the outcomes are clearly communicated and actionable,

Keeping the group engaged over a certain time span

What we learned: The "Design Thinking" method helped maintain participant engagement throughout the workshop. The structured approach and interactive exercises kept participants focused and involved.

Recommendations: For future activities, consider using similar structured and interactive methods to keep participants engaged over longer periods. Regular breaks and varied activities can also help maintain energy levels and interest.

Anything else?

Continuous Evaluation and Adaptation: Emphasize the importance of continuously evaluating educational approaches and being willing to adapt methodologies based on emerging trends and needs within the bioeconomy sector.

Motivational Frameworks: Develop motivational frameworks for both educators and students to encourage the adoption of bioeconomy study fields. This can include incentives, recognition programs, and opportunities for professional growth.

Holistic Educator Development: Recognize the importance of ongoing professional development for educators. Encourage peer-to-peer education, interactions with researchers and entrepreneurs, and continuous learning to enrich their perspectives.

ITALY

Partner/Organisation	FVA, co-leader UNIBO
CoP country	Italy, Apulia region, Emilia Romagna region
CoP size	110

Focus Groups

The first focus group took place onsite in Apulia Region on April 3, 2023, University of Bari Aldo Moro, organized by FVA. The focus group target was to develop a regional governance model supporting bioeconomy development in the region. The meeting focused on life-long learning in bioeconomy, innovative educational models and the involvement of vulnerable and marginalized groups (40 people participate, 25 education providers, two economic actors, four policymakers, one funding agency, two wider society). The objective of the workshop was to identify regional priorities, needs and collect additional case studies. The second focus group organised by UNIBO took place on April 12th, 2023, onsite in Bologna. It targeted around 20 participants, mainly education providers.

Co-Creation workshops

The co-creation workshop took place online on July, 17th, 2023, organized by FVA, supported by UNIBO partners and it broadened the target group to include representatives from across Italy, after launching the CoP activities in two pilot regions. This expansion aimed to ensure better representation of the country as a whole. 20 people participated, 15 education providers, two policymakers, three from the art sector. The

objective of the workshop was to kick-off the regional Community of Practice on life-long learning in bioeconomy, with a special focus on innovative formats stemming from the intersection between circular bioeconomy and art. The overall purpose of the workshop was to identify the regional needs with regard to training in the bioeconomy sector,

Co-Design workshops

The two co-design workshops "Bioeconomy and Art in the Italian educational pathways: designing future scenarios for the implementation", were jointly organized by FVA and UNIBO online on 24th October and 3rd November 2023, in the context of the [European Vocational Skills Week 2023](#), In total. There were 30 participants, (education providers, two of each in the other groups). The workshop focused on how formal and informal education can better connect with future skills for job profiles in the bioeconomy, MIRO Boards and MENTIMETER were used to gather inputs from the participants concerning training needs, recommendations, and actions to be taken. The "Design Thinking" method allowed in in-depth understanding of needs.

Policy workshops

In celebration of Italian Bioeconomy Day and ahead of the revision of the European and Italian Bioeconomy Strategies. The event was organized in collaboration with the "National Coordination Group for Bioeconomy" at the Presidency of the Council of Ministers in Rome on the 24th of May 2024. The event shared insights from the European Commission, CBE JU and JRC and leading projects and initiatives in bioeconomy education, such as BIObec, BioGov.net, GenB, Engage4BIO and EuBioNet, national Ministers and regional leaders, 20 policymakers discussed further steps for bioeconomy development and education. The Ministries were willing to cooperate with FVA and UNIBO as experts, BioGov.net will be mentioned in the National roadmap in preparation for the updated National Bioeconomy Strategy.

Additional engagement and information activities

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Country specifics and identified barriers

Country / CoP specifics

In the workshops, MIRO Boards were used to facilitate the engagement of the participants and to collect their inputs. Future implementation scenarios were visualized. Participants were able to contribute their vision of an educational system able to effectively respond to the specific training needs. An additional interactive session was organized using MENTIMETER, to define recommendations for the educational development.

These formats aligned in a design thinking process helped to effectively engage participants and to foster active discussions. They ensured a good exchange of ideas with contributions from every participant.

Barriers encountered and mitigation measures applied

BioGov.net was recognized as highly relevant for the update of the National strategy. Therefore, BioGov.net will be mentioned in the National roadmap in preparation for the updated National Bioeconomy Strategy. It is not easy to combine the art dimension, marginalized groups and bioeconomy. The first CoP activities should involve a wider audience in order to attract the final stakeholders to be formally engaged in the CoP (not all of them will participate). Concerning the workshop atmosphere, keeping an informal atmosphere by stimulating questions from the participants and facilitating networking during breaks seems to be a key factor for successful formats.

Future Needs and demands identified

Participants highlighted that Bioeconomy education must be interdisciplinary, locally grounded, and aligned with industry needs. This requires collaboration across sectors, informed policy and training strategies, and inclusion in regional priorities. Regional education providers should be involved (e.g. libraries, multipliers, industrial districts). Ecosystem facilitators and connectors are considered to be necessary for the transition/education. Arts-based approaches were recognised by all stakeholders as relevant in fostering inclusion and transversal skills, but further work is needed to develop structured educational pathways. Economic incentives and support from non-traditional educational actors (e.g. clusters, professional associations, museums, local libraries) can also play a key role in promoting green jobs and engaging learners.

Lessons learned and future recommendations

Stakeholder Engagement

What we learned: effective in engaging participants and fostering active discussions. It ensured that every participant contributed leading to a rich exchange of ideas.

Recommendations: Partnership with local organisations is key for the success of the Online meetings. Supporting tools carefully designed (e.g. Menti and MIRO) are proven to be effective in stimulating the debate and collecting all relevant input.

Design of formats to animate discussions

What we learned: Interactive formats such as presentations of job profiles and case studies contributed by participants were effective in animating discussions and keeping participants engaged.

Recommendations:

dedicate 90 mins of case studies presentations, having 10 people on stage and around 15 case studies and formats presented. Give brief presentations/pitches ("buffet of ideas"), including BioGov.net methodology to link art and bioeconomy education

The main objective is to inspire and inform the audience. The open debate with all the participants was especially animating for the discussion.

Making sure outcomes are meaningful

What we learned: Discussion table can host maximum 20 people with two facilitators, or 10-12 with 1 facilitator. Alternate sticky notes and verbal exchange during the open debate. Make sure that all the participants are involved in the debate, asking directly.

Keeping the group engaged over a certain time span

What we learned: Inviting the stakeholders and speakers in the “buffet of ideas” ensure their presence in the following open debate. Having European high-level speakers was key to attract relevant Italian policy makers since they are interested to see the connection with their work and the EU strategies. Discussion table can host maximum 20 people with two facilitators, or 10-12 with one facilitator.

Recommendations: Make sure that different stakeholders participate in the workshop to include different agendas and expected outcomes in the results. Going macro-regional is much more effective rather than working at the regional/local level. Provide in advance material ready to use. Make sure that all the participants are involved in the debate. Alternate sticky notes and verbal exchange during the open debate.

Anything else?

Continuous Evaluation and Adaptation:

Be flexible and open to call on additional participants to share interesting case studies (this facilitates the sense of involvement). Keep an informal atmosphere by stimulating questions from the participants and facilitating networking during lunch and coffee breaks.

Motivational Frameworks: Regional priorities should define educational curricula.

The first CoP activity should involve a wider audience to attract the final stakeholders to be formally engaged in the CoP (not all of them will participate). Partnership with local organizations is key for the success of the initiative (trusted relationship with local stakeholders, awareness of good practices)

Holistic Educator Development

Ecosystem facilitators and connectors are key for the transition and should be a primary target for education. Other domains like tourism, event organization, crafting, and transforming industries should be reached by dedicated education (through new formats).

Working with “technical” people (e.g. the ones that are actually writing the bioeconomy strategies in the region) is favourable, to make sure the project’s assets will be integrated.

ART – BioEast Hub CR

Partner/Organisation	ART – BioEast Hub CR
CoP country	Czech Republic
CoP size (?)	15-18

Focus Groups
<p>In the case of Czech Republic, ART and its covering structure BioEast Hub CR belong to the BioEast platform and operate tightly with the structures and operational modes of it. We are going to briefly explain this structure which will justify the particularities of the Czech CoP. Each BioEast country has created a Bioeconomy Hub comprising a wide spectrum of stakeholders. This Hub focuses on national issues, also considering the wider BioEast perspective. The Czech Hub was created in 2022 and it is a legal entity. On the other side within the BioEast platform operate Thematic Working Groups (TWGs). Among them, the TWG on Education is let by the Czech Hub comprises educators and also people from the public administration on the matters of education for the 11 BioEast countries.</p> <p>Further on, each country Hub can potentially create a mirror TWG, reflecting the priorities of the BioEast respective TWG but mostly focusing on National issues and priorities. This mirror TWG was the start of the Czech CoP on education. At the beginning the CoP was including 9 members, 6 of them being academics (education & research), 2 people from the public administration (policy makers) and 1 from the wider society. The participation in the Czech CoP is free and it does not require the signing of a form of commitment. The CoP was involved in organizing focus groups among its member and wider audiences but also to provide information and enhance knowledge through promoted seminars and other activities</p> <p>It is important to mention that CoP on Education was created for the needs of the BioGovNet project but is expected to have a valuable presence even beyond the project's life.</p>
Co-Creation workshops
<p>The Co Creation workshop took 2 February 2025 in Troubsko Czech Republic (where are the location of ART which is the BioGovNet partner). The Cocreation Workshop was designed to bring together the diverse members of the Community of Practice but also to be as open and inclusive as possible, thus the wide participation (45 participants). The aim was to have a substantial collaborative opinion on the shape of future directions for Bioeconomy education. The purpose was to foster a sense of shared ownership over the development of innovative, inclusive, and action-oriented educational frameworks that respond to the evolving demands of the Bioeconomy various sectors. Outcomes were touching several key issues such as future activities, curricula, and initiatives. The Co creation methodology helped to gain viewpoints in perspectives from various stakeholders, after an interactive dialogue and brainstorming. 45 people participated. Among them they were 13 Education providers, 19 Economy actors, and 10 Policy makers.</p>
Co-Design workshops

The purpose of the Codesign Workshop was to collaboratively develop a shared vision, frameworks, and strategies related to Bioeconomy education. By bringing together a diverse Community of Practice and aiming to explore the collective expertise and perspectives of the involved stakeholders. Even though the participation was not great and the group of stakeholders was rather heterogeneous with the predominance of people from the Academia, the designs were inclusive, relevant to real challenges, and aligned with emerging trends in the Bioeconomy. Participants highlighted issues reflecting the Czech Reality and had ideas for further steps. The necessity of partnership between sectors and sector-specific education and training in order to enhance competitiveness were highlighted.

Policy workshops

The purpose of this Policy Workshop is to bring together key stakeholders from various sectors—including policymakers, for a collaborative dialogue, aiming to identify policy gaps, align educational strategies with emerging Bioeconomy needs. Through this workshop, CoP in CR seeks to inform and influence the development of policies that support the growth of a skilled workforce capable of driving sustainable Bioeconomy Education practices at all levels. In the policy workshop participated 26 people (18 education providers and 8 policy makers).

Note: It is important to mention that the Policy workshop was organized by the Bio-East Hub CR in the frame of the Thematic Working Group on Bioeconomy Education (TWG Edu) of the BIOEAST Initiative. In this workshop were participated Education stakeholders from all BIOEAST Countries and not just the Czech Republic. The outcomes of this workshop were reported to the HE-funded project Boost4BioEast. There are presented here only as a relevant information to the BioGovNet project.

Additional engagement and information activities

As it was mentioned in the beginning, the core of the Czech CoP on Biotechnology Education I the mirror TWG on Education within the Czech BioEast Hub. As such the core is very active in organizing events, workshops seminars, participates in international events, it is partner is various HE funded projects related to Education, while is always involved in the national happenings considered as a key player on Bioeconomy Education within the country.

Comparison of outcomes between the CoPs on format implementations

Country / CoP specifics

The Co-Design workshop that took place in Czech Republic resulted into some key principles which that were adopted by all participants. These there were briefly 1/ The shared understanding of Bioeconomy Education needs based on identified key competencies, knowledge areas, and skills necessary for future professionals in the Bioeconomy sector. That also included a shared vision for the Bioeconomy Education 2/ Education planning should be in accordance with actual needs and demands therefore the stakeholder's needs should be mapped 3/ The CoP should

be as inclusive as possible comprising stakeholders from all sectors and domains. Participants expressed a willingness to continue collaborating through working groups, pilot projects, and knowledge exchange activities, recognizing the value of maintaining an active and dynamic Community of Practice. Additionally, some stakeholders mentioned that the CoP should act as a catalyzer bridging gaps and conflicts among (sometimes antagonistic) various stakeholders' groups. Typical issues such as low participation of heterogeneity and unbalanced participation in the CoP should be faced on a case-by-case basis.

Barriers encountered and mitigations measures applied

Several barriers were encountered in various levels during these workshops. We can mention the more significant ones as follows: 1/ Critical gaps in curricula, outreach, and engagement strategies 2/ lack of awareness, 3/ lack of supportive policies, 4/ not enough industry involvement, 5/ Little awareness and interest 6/ Irrational prioritization of learning pathways including vocational learners.

Due to the heterogeneity of the barriers, the mitigation strategies are not universal and they have to be decided and adopted on a case-by-case basis.

Future Needs and demands identified

Participants in the workshops had various requirements and needs identified. However, based on the rationale developed behind them we can prioritize the needs and demands as follows: 1/ Necessity for cooperation between the actors involved in the education but also between education and private sector in the sense of vocational training. 2/ Inclusion of the Education in Policies and Strategies focusing on the wider Bioeconomy perspective 3/ Enhancement of the awareness and understanding of the end users using a wide spectrum of tools and media 4/ Additional funding opportunities especially from the private sector.

Lessons learned and future recommendations

Stakeholder Engagement

What we learned: Involving stakeholders directly in the design process increased their sense of ownership and motivation to contribute to future actions. This results to a more active participation of the stakeholders in all phases and processes.

Recommendations: It is recommended to give stakeholders more opportunities for active participation, to enhance their role in decision making and for shaping processes according to their interests.

Design of formats to animate discussions

What we learned: Methodologies and Interactive formats by means of online resources are very effective to animate the discussions. Including case studies and videos is essential in visualization and in scenarios making. Finally, it is very important to create pre-workshop information and to give it to stakeholders. This allows then to improve their understanding and to feel more comfortable.

Recommendations: Use any tools and possibilities to enhance the familiarity of the

stakeholders with the topic. This will highly improve the impact in all levels.
Making sure outcomes are meaningful
<p>What we learned: 1/ Clear Pre-Workshop Communication Enhances Outcomes. 2/ Motivation is Important to enhance the Impact: Stakeholders were most motivated when they saw how their input would directly influence concrete outcomes. 3/ Post-Workshop Follow-Up is Critical: To maintain momentum and trust, it is vital to clearly communicate next steps and ongoing activities</p> <p>Recommendations: In order to guarantee that the achieved results are significant these two parameters mentioned above must be respected and considered.</p>
Keeping the group engaged over a certain time span
<p>What we learned: Three parameters are essential in order to guarantee a constant engagement: 1/ Flexibility: Which is mandatory in all levels and steps. 2/ Substantial Motivation in order to enhance the impact: Stakeholders were most motivated when they saw how their input would directly influence concrete outcomes. 3/ Capacity Building: There is a need for additional training and capacity building, both for educators and non-academic stakeholders, to bridge knowledge gaps.</p> <p>Recommendations: In order to guarantee the continuation of the CoP activities over a certain time span. The above three parameters mentioned must be respected and considered.</p>
Anything else?
<p>Several issues and topics should be taken in consideration:</p> <ul style="list-style-type: none"> • Ongoing Stakeholder Engagement is Essential: Successful Bioeconomy education initiatives require the continuous involvement of diverse stakeholders from the beginning • Building a Shared Vocabulary is Crucial: Clarifying key concepts (e.g., Bioeconomy, circular economy, sustainability) early on helps prevent miscommunication and aligns diverse stakeholder groups toward common goals • Focus on Practical, Action-Oriented Outcomes: Stakeholders highly value the production of concrete frameworks, tools, and actionable plans • Sustaining Communities of Practice Requires Dedicated Resources • Cross-sector Collaboration is a Key Driver

THE NETHERLANDS

Partner/Organisation	Avans Hogeschool, BTG
CoP country	Netherlands
CoP size	38

Focus Groups

The focus group took place in Avans Hogeschool, on-site May 25, 2023, organized by Pedal Consulting. The focus group aimed at the identification of regional needs, with regard to vocational training and education, best practice and future stakeholders. It focused on lifelong learning in bioeconomy, innovative educational models, and the involvement of vulnerable and marginalized groups, 17 stakeholders, mainly education providers, actors attend educational Companies that are open for change, tackling educational issues together, a common vision for the long term (like life-long learning) were seen as key factors.

Co-Creation workshops

The Dutch Co-creation workshop took place on 1three September 202three on site in Avans Hogeschool, Breda, organized by Avans and supported by BTG. The workshop focused on educational governance needs in the Dutch region. It aimed to initiate a discussion on competences and necessary skills for the bioeconomy in the region and dealt with the question of how art, culture and the creative industries can contribute to the development of educational programs. Outcomes were that training programs have to be tailored for respective of the target group, e.g. employees (upskilling) are favoured the general audience needs substantial guidance.

Co-Design workshops

The first co-design workshop took place online on October 10, 2023, organized by Avans Hogeschool, supported by BTG. The topic of learning programmes entailed a lot of discussion. Therefore. It was carried out as an online event.

The workshop had eight participants and used a Mural board canvas to gather the input of the participants during the co-creation, codesign process, Interdisciplinary collaboration, technical skills, environmental and safety awareness, communication skills, and problem-solving ability were considered key factors. Flexibility, work-life balance, modular education, utilization of new technology, and Lifelong Learning were considered important, Dutch VET programme developers need to consider effective recruitment and promotion strategies, sharing early successes.

Policy workshops

The Dutch Regional Policy Workshop on bioeconomy education was replaced by interviews between May 29 and June 20, 2024.

Additional engagement and information activities

eight interviews were carried out between May 29 and June 20, 2024, replacing the policy workshop. Stakeholders from the bioeconomy sectors like education providers, economic actors and policymakers (triple helix) were involved. The interviews addressed gaps in the current governance systems and tried to outline the design of bioeconomy skill development. Guidelines and next steps

were addressed. The stakeholders considered cooperation and communication as key factors besides intrinsic motivation and financial support. A combination of long-term goals and short-term action was seen as beneficial,

Country specifics and identified barriers

Country / CoP specifics

In the Focus group, partners were given the opportunity to share their vision and activities in the field of (vocational) training | education | lifelong learning. First Part plenary discussion. It started with a brief introduction of all the participants (tour de table). Then 2nd part– roundtables. Thus, open debate was possible in smaller groups with the objective of identifying needs and regional priorities in the bioeconomy sector. Preparation – e.g. making and using the job profiles cards – helped in getting sufficient interaction. Splitting into groups worked well to ensure engagement of nearly all.

The use of Mural was helpful to structure the discussion in online events like the codesign workshop.

Policy: As an event format. The semi-structured interview was chosen. It can gather wide-ranging input. It was beneficial to have expert active in this field as participants at the Focus-group and - co-design workshop leading to a broad consensus.

Personal invitations did help in getting a sufficient turnout.

the participants were quite willing to contribute, even though the topic was quite abstract.

Barriers encountered and mitigation measures applied

Participants faced challenges such lack of funds, marketing strategies, and quality lecturers. It is crucial to adjust formats to make them more appealing. Open-source educational material could help to spread interest and knowledge on bioeconomy

Future Needs and demands identified

Participants saw the need for tailored trainings for different target groups, e.g. employees (upskilling) are favoured general audience needs substantial guidance.

Lessons learned and future recommendations

Stakeholder Engagement

What we learned: Interaction and cooperation between members of the triple helix (s. a.) were seen as necessary.

Recommendations: It was beneficial to have expert participants for the policy interviews, as they could relate much faster than others. On the whole there was a broad consensus. As event format for the interviews the semi-structured interview was chosen, which allowed more going into detail.

Design of formats to animate discussions

What we learned: On-site Workshops offer a multitude of discussions and debates. Smaller groups allow individual topics. The Mural approach, as used in the online format of the Co-design WS is quite helpful. Interviews were able to gather in depth information.

Recommendations:

Mural creates very many ideas and remarks made per topic, which do not always align with each other. A pre-prepared Mural canvas helped to structure the discussion, and ensures that all relevant topics are addressed.

Making sure outcomes are meaningful

What we learned: In interviews it was considered beneficial, that the interviewed stakeholders were active in the field of bioeconomy education and had experience in cooperating with other organizations. Participation rate was 100% and the quality of the answers was very high.

Recommendations: Use interviews as a complementary device for on-site and online formats.

Keeping the group engaged over a certain time span

What we learned: the best overall success may be achieved with a combination of interviews and onsite and online workshops.

Recommendations: For future activities, consider using different formats

Anything else?

Continuous Evaluation and Adaptation: It was emphasized that there was a need for different types of certifications. There are no certification systems available for on the job trainings and for open-source education.

Holistic Educator Development: Recognize the importance of ongoing cooperation between companies and educational institutions.

GERMANY

Partner/Organisation	WILA
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CoP country	Germany
CoP size	32

Focus Groups
<p>The focus group took place onsite in the School Lab “JuLab”, located in the research center Jülich, Jülich, Germany on June 20th, 2023, organized by WILA. The focus group aimed at identifying the regional needs and priorities with regard to bioeconomy education, such as vocational training and offers of life-long learning in the bioeconomy sector in the region. It focused on innovative trainings, and best practice concerning the involvement marginalized groups and art and design, 10 people participated, four educational Provider, 1one economic actor, two policymakers and one from wider society.</p>
Co-Creation workshops
<p>The Co-Creation workshop took place online via Zoom on September 6th, 2023, organized by WILA. It showcased best practices from the Rhenish Mining area. It aimed at exchanging views of all stakeholders on the skills needed in regional jobs and defining what training and educational programmes on bioeconomy should consist of. It focused on competencies needed for jobs in the region in the field of bioeconomy and fostered collaboration in the bioeconomy sector. The Co-creation methodology helped to gain insights in perspectives from various stakeholders, by applying brainstorming and deep dives. Further insights for the project's methodological approach was collected. Eight people participated, one education provider, three economic actors, three policymakers.</p>
Co-Design workshops
<p>The first co-design workshop took place online on October 24th, 2023, organized by WILA. The workshop focused on collecting ideas on the design of vocational and regular bioeconomy training and contributions to the design of curricula in alignment with future skills needed for job profiles in the bioeconomy. The "Design Thinking" method was used to develop creative solutions for complex problems. It included rapid brainstorming and a deep understanding and identification with the needs of the target groups. The fact that only two people attended was offset by the fact that the participants were experts with a profound knowledge from two stakeholder groups.</p> <p>The second co-design workshop took place online on October 31st, 2023, organized by WILA. It also focused on the recommendation of training programs and the role of policymakers in that context. By applying the co-design methodology, participants were engaged in the discussion of the impact of bioeconomy trainings and the role assignment of different stakeholder groups, four people attended the workshop. They came from stakeholder groups that were complementary to those of the 1rst workshop.</p>
Policy workshops
<p>The German Regional Policy Workshop, titled " The future starts now! - Promoting skills in the field of bioeconomy" took place online on May 23rd, 2024. It was organized</p>

by WILA. The workshop aimed at reviewing current governance systems about the promotion of bioeconomy competences in the region. Besides assessing requirements for the integration of bioeconomy skills. It also discussed the impediments hindering the development. The event focused on the collation of concrete measures integrating bioeconomy into educational processes and highlighted the incentives that are necessary for those developments, 10 Participants discussed the next steps for developing bioeconomy education.

Additional engagement and information activities

Besides the formats described above, eight stakeholders were involved by interviews. They were being addressed during events on bioeconomy and contacted via e-mail and phone calls. They comprised all stakeholder categories. Those actions were being taken because of the little engagement in the German CoP, especially during the Co-Design Workshops. The results of the interviews were integrated into the outcome of the Co-Design workshops.

Country specifics and identified barriers

Country / CoP specifics

The Co-creation workshops that took place in Germany used various methods. Besides brainstorming. The "Design Thinking" method was implemented to create solutions and ideas on bioeconomy trainings. Participants stressed the necessity of practical experiences and development of technical skills, as well as the use of open-source learning methods. Addressing the CoP members was challenging at times with low participation. Therefore. The formats were changed from on-site events to online events. Additionally, low participation was countered by further individual interviews. There is a lot of competition between the different stakeholders in our community of practice in Germany, which makes it difficult to address members of the Community of practice.

Barriers encountered and mitigation measures applied

Barriers encountered were lack of information and exchange on bioeconomy issues. Little awareness and interest led to low engagement. Means to overcome these shortcomings were to initiate various meetings and interviews, to participate in events related to bioeconomy and cooperate with sister projects.

Future Needs and demands identified

The Participants identified the necessity of modern learning methodology and put emphasis on practical learning experience. Furthermore, participants named a lack of educational strategy and governance models at a regional/national level, insufficient funding opportunities, and too little public awareness as the biggest impediments. Recommendations were to increase practical experiences by enlarging the number of internships and the involvement of students in research activities, targeted

communication measures should lead to a closer alignment of research, production and consumers and to the integration of marginalized groups.

Lessons learned and future recommendations

Stakeholder Engagement

What we learned: Low participation can be countered by additional interviews. The "Design Thinking" method is a highly effective method that engages participants and implements active discussions.

Recommendations: For future activities. It is recommended to spend more time on addressing the stakeholders before inviting them to events. More time for inviting participants is equally important. Keeping stakeholders well informed and using interactive methods to maintain high levels of engagement are further recommendations.

The sequence of the formats was okay.

Design of formats to animate discussions

What we learned: Design Thinking and Interactive formats by means of online resources, e.g. as MIRO Boards, were highly effective to animate the discussions. Working with job profiles and case studies, and videos helped to visualize future scenarios.

Recommendations: Excursions to firms that work in the field of bioeconomy and making use of products and materials enhancing the various aspects of bioeconomy could provide additional practical insights.

Making sure outcomes are meaningful

What we learned: The implementation of empathetic interviews and the creation of prototypes made sure that the results of the activities met significantly the workshop's objectives.

Recommendations: Make certain that the results are communicated clearly and can be acted upon. Briefing of CoP members on the outcomes of the workshops contributes to further implementation

Keeping the group engaged over a certain time span

What we learned: The "Design Thinking" method helped maintain participant engagement throughout the workshop. The structured approach and interactive exercises kept participants focused and involved.

Recommendations:

More variation of formats and competition with prizes can help keep participants engaged over longer periods. Regular breaks and varied activities are equally important

Anything else?

Continuous Evaluation and Adaptation: Emphasize the importance of ongoing Assessment and Adjustment. It is important to assess regularly educational strategies.

Modifying methods in response to new trends and requirements in the bioeconomy sector is important.

Motivational Frameworks: Create motivational structures for both educators and students to promote the pursuit of studies in bioeconomy. This could involve implementing incentives, establishing recognition programs, and providing opportunities for professional development.

Holistic Educator Development: Acknowledge the significance of continuous professional development for educators. Promote peer-to-peer learning, foster interactions with researchers and entrepreneurs, and support ongoing education to broaden their perspectives and enhance their teaching practices. Recognize the importance of ongoing professional development for educators. Encourage peer-to-peer education, interactions with researchers and entrepreneurs, and continuous learning to enrich their perspectives.

For future activities, consider using more communication measures, like social media and collaborative projects, as part of job orientation initiatives, communication of exhibits, competitions, and prizes.

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