GENB
YOUNG BIOVOICES FOR A SUSTAINABLE FUTURE

# D2.2 Deliverable

## Report on Inspire, Inform and Educate activities - First period

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OUR CONSORTIUM

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## Revision History

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| 2.0 | 24/04/2024 | Chiara Pocaterra, Flavia Fusconi and Laura Mentini | Final revision |

# Table of Abbreviations and Acronyms

| Abbreviation | Meaning |
|---|---|
| AIJU | ASOCIACIÓN DE INVESTIGACIÓN DE LA INDUSTRIA DEL JUGUETE CONEXAS Y AFINES |
| APRE | Agency for the Promotion of the European Research |
| AT | Austria |
| BCF | EC Bioeconomy Changemakers Festival, held in March 2024 |
| BE | Belgium |
| BIOBEC | H2020 project, GA No. 101023381, https://biobec.eu/ |
| BIOBRIDGES | H2020 project, GA No. 792236, https://www.biobridges-project.eu/ |
| BIOVOICES | H2020 project, GA No. 774331, https://www.biovoices.eu/ |
| BIOWAYS | H2020 project, GA No. 720762, https://www.bioways.eu/ |
| BLOOM | H2020 project, GA No. 773983, https://bloom-bioeconomy.eu/ |
| BTG | BTG BIOMASS TECHNOLOGY GROUP BV |
| CBE JU | Circular Bio-based Europe Joint Undertaking |
| DDW | Dutch Design Week |
| DE | Germany |
| EL | Greece |
| ENGAGE4BIO | Horizon Europe project, GA No. 101059565, www.engage4bio.eu/ |
| ERN | European Researchers' Night, a Europe-wide public event |
| ES | Spain |
| EU | European Union, or EU-wide (aka Pan-European) |
| EuBioNet | European Bioeconomy Network |
| EUN | EUN Partnership AISBL |
| FCL | Future Classroom Lab (a facility at European Schoolnet) |
| FVA | FVA SAS DI LOUIS FERRINI & C |
| GA | Grant Agreement |
| H2020 | Horizon 2020 |
| HSPN | HELLENIC SOCIETY FOR THE PROTECTION OF NATURE |
| IBL | Inquiry-based learning |
| IP | Implementation Plan for WP2 |
| IR | Report on Inspire, Inform and Educate activities (Implementation Report for WP2) |
| IT | Italy |
| KPI | Key Performance Indicator |
| LOBA | GLOBAZ, S.A. |
| MOOC | Massive Open Online Course |
| NL | The Netherlands |
| PEDAL | PEDAL CONSULTING SRO |
| PT | Portugal |

| | |
|---|---|
| Q-PLAN | Q-PLAN INTERNATIONAL ADVISORS PC |
| QR | Quick R |
| RPG | Role-Playing Game |
| SDC | STEM Discovery Campaign |
| SK | Slovakia |
| SPW | Science Projects Workshop (a Scientix format) |
| STEM | Science, Technology, Engineering, and Mathematics |
| STE(A)M IT | Erasmus+ project, GA No. 612845, steamit.eun.org/ |
| T | Task |
| TED | Technology, Entertainment, Design |
| TEDx | A specific type of TED conference |
| TRANSITION2BIO | H2020 project, GA No. 101000539, **www.transition2bio.eu/** |
| UNIBO | ALMA MATER STUDIORUM - Università di Bologna |
| WP | Work Package |
| y.o. | Years old |
| ZSI | ZENTRUM FÜR SOZIALE INNOVATION GMBH |

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# 1 Executive Summary

WP2 maximises the exploitation of contents and innovative approaches collected and co-created in WP1 through an integrated package of "Inspire, Inform and Educate" activities tailored to all the GenB target ages, teachers, and other multipliers, in local languages in partners' countries, in the context of large-scale events, ad hoc settings and piloting schools. WP2 objectives include:

- To grow the citizens, workforce, and decision makers of the sustainable future by increasing awareness of the environmental, social, and economic benefits of sustainable and circular bioeconomy and bio-based sectors (T2.1)
- To experiment new ways of attracting talent in the life science, technology, and the bioeconomy opportunities (T2.2)
- To promote the transition towards a more sustainable production, consumption, and lifestyle of the new generations (T2.3)
- To maximise the impact of GenB by channelling the bioeconomy education strengthening the knowledge of teachers (T2.4)
- To increase GenB impact and to reach wider audiences by engaging and supporting multipliers (T2.5)

This document provides the first release of the implementation report for WP2 "Inspire, Inform & Educate" activities, due after the first 18 months of the GenB project (November 2022 - April 2024). The WP leader (BTG) coordinated the preparation of this document, defining the methodological approach with the support of all format leaders (AIJU, APRE, BTG, EUN, FVA, and PEDAL). The content of this document was provided by the staff of all consortium members.

The objective of this deliverable is to provide a brief overview of the results achieved and experiences gained implementing the WP2 activities in the period 1 November 2022 – 15 April 2024. The report provides for each of the WP2 formats/activities implemented under the five WP2 tasks:

- the concept of the format/activity, and the prior experience with it.
- the activities implemented in GenB (to date).
- the main lessons learned before and during GenB implementation.

This document provides primarily qualitative information. Some quantitative information on WP2 implementation results (e.g. performance vis-à-vis the key performance indicators - KPIs) are also included. Full details on performance vis-à-vis KPs are provided in D4.2 (Impact monitoring and assessment strategy – first period) and the associated self-check global table.

# 2 Introduction

## 2.1 Background on the GenB project

GenB contributes to the implementation of the updated 2018 EU Bioeconomy Strategy and the European Green Deal priorities, and the achievement of a climate-neutral Europe by 2050 and the Sustainable Development Goals, involving the most relevant awareness and education EU funded projects and initiatives, wide European and International school networks, and experts in socio-economic science and humanities.

GenB overall objective is to raise the Generation Bioeconomy (GenB), aware, sensitive, and interested in environmental issues, sustainability, and circularity.

## 2.2 Target groups

Within GenB, the following target groups are distinguished (see Table1): Pre and early-school 4-8 years old, Elementary school 9-13 years old, High school 14-19 years old, Teachers, Multipliers, Parents, Policymakers. As shown in the table below the seven target groups can be grouped into four clusters (Young people, Multipliers, Parents and Policy makers).

| **Young people** | **Multipliers** |
|---|---|
| Pre- and early-school (4-8 y.o.) | Teachers (formal education professionals targeting all ages students) |
| Elementary school (9-13 y.o.) | Other multipliers (non-formal education professionals: youth organisations, community groups, museums, science communicators, amusement parks, journalists and media, NGOs). Experts' groups and communities of practices in education. |
| High school (14-19 y.o.) | |
| **Parents** | **Policy makers** |
| Young people' parents and in general the families. | Public authorities and policy makers related to education at local, national, and European level (Ministries of Education, European Commission DG R&I and DG Education and Culture). |

*Table 1 - GenB target groups*

## 2.3 WP2 Objectives

As stated in Grant Agreement (GA) "WP2 maximises the exploitation of contents and innovative approaches collected and co-created in the first Work Package[1] through an integrated **package of "Inspire, Inform and Educate" activities** tailored to all the GenB target ages, teachers, and

[1] WP1 "Co-creation of innovative approaches" co-creates innovative approaches for awareness, information and education on bioeconomy, environmental issues, sustainability and circularity and cooperation between teachers, parents, and youth to drive collaboratively the bioeconomy transition towards a more sustainable production, consumption and lifestyles designing tailored toolkits.

other multipliers, in local languages in partners' countries, in the context of large-scale events, *ad hoc* settings and piloting schools (reached mainly through EUN and HSPN)".

WP2 objectives include:

- To grow the citizens, workforce, and decision makers of the sustainable future by increasing awareness of the environmental, social, and economic benefits of sustainable and circular bioeconomy and bio-based sectors (Task 2.1)
- To experiment new ways of attracting talent in the life science, technology, and the bioeconomy opportunities (Task 2.2)
- To promote the transition towards a more sustainable production, consumption, and lifestyle of the new generations (Task 2.3)
- To maximise the impact of GenB by channelling the bioeconomy education strengthening the knowledge of teachers (Task 2.4)
- To increase GenB impact and to reach wider audiences by engaging and supporting multipliers (Task 2.5)

## 2.4 WP2 Organization

For the implementation of WP2, a distinction is made between formats, tasks, and activities.

**Format** refers to a general plan of organization, arrangement, or choice of material. As specified in the GA), in GenB up to 17 different formats will be implemented. The intention of GenB is to explore formats in two ways.

- Firstly, to assess what worked and works best when implementing a specific format.
- Secondly, to assess how best to combine and integrate different formats, not only those that are part of WP2 but also formats included in WP1 (Co-creation of innovative approaches) and WP3 (Engage, Empower & Take a role).

For each format in WP2 a **format leader** is in charge. An overview of the format leaders is presented in Annex 1. The format leader has prior experience developing and applying the format in one or more (earlier or ongoing EU-funded bioeconomy) projects. The format leader will transfer knowledge on the format. Knowledge transfer shall first and foremost be targeted at internal parties (project consortium members), but external parties (third parties) can also benefit. For use within GenB, it will be necessary to adapt/refine existing formats (e.g., modify the visualisation, refine the scope, rephrase the content, translate the content, etc.).

The 17 GenB formats are clustered into five different **tasks**, reflecting the five WP2 objectives, and each led by a task leader. The last two tasks address formal and non-formal educators, whereas the first three tasks are aimed at young people, usually of all three age classes, as follows:

- **T2.1 Inspire and inform young people on sustainable and circular bioeconomy and bio-based sectors:** This task showcases inspirational real-life examples of bioeconomy and bio-based products. Lead: HSPN.
- **T2.2 Inspire and inform students in bioeconomy careers.** This task experiments activities to attract new generations on bioeconomy related careers. Lead: BTG.
- **T2.3 Educate young people to promote the biotransition:** This task promotes sustainable and circular behaviours and lifestyles through the delivery of dedicated educational activities. The task use the toolkits[2] developed in T1.4. Lead: BTG.
- **T2.4 Educate teachers in teaching the bioeconomy:** This task equips teachers with a package of knowledge and capacities to train their students in bioeconomy through online courses, based on the toolkits developed in T1.4. Lead: EUN.
- **T2.5 Inform and educate other multipliers to promote the bioeconomy.** This task engages and supports non-formal educators (such as museums, theatres, festivals, etc.) to act as multipliers by adopting the toolkits developed in T1.4. Lead: PEDAL.

The task leaders are charged mainly with co-authoring both editions of the Implementation Report for WP2 (D2.2 due M18/April 2024; D2.3 due M28/Feb 2025).

An **activity** is something you do, or something that happens. In the context of GenB, activity refers to the implementation of a format in a specific country by the **activity leaders**. Depending on the context in which the GenB activity is implemented, it may be necessary to make (further) refinements to the GenB format. As each GenB format will be implemented in between 1 and 9 countries, there are ca. 75 activities in total[3]. Many but not all activity leaders have prior experience implementing the activity, or something similar, in their respective countries.

The organization levels and the different roles in WP2 are summarised as follow:

| Role | Responsibility in WP2 | Tasks in relation to current report |
|---|---|---|
| WP leader | Provide support and keep eye on general progress in WP2 | Monitor general progress of WP2. Document editing. |
| Task leader | Monitoring task implementation progress | |
| Format leader | Transfer knowledge on the format | |

[2] GenB Toolkit/s: A GenB Toolkit is a compilation of materials and resources aimed at promoting knowledge about the Bioeconomy and enabling the acquisition of significant learning on the subject. In T1.4 of GenB, "Co-creation of innovative approaches", a set of educational toolkits is being developed to cover WP2 and WP3 activities addressing all target groups (pre- and early-school children, 4-8 years old; elementary school students, 9-13 years old; high school students, 14-19 years old; teachers; other multipliers).

[3] Where relevant and practical, multiple formats can and will be combined when implementing an activity.

| | | |
|---|---|---|
| Activity leader | Planning and implementing the format in a specific country | Provide relevant content for the current report |

*Table 2 - Management levels and roles in WP2*

## 2.5 Scope of the Implementation Report for WP2

The current document is the Report on Inspire, Inform and Educate activities - First period (IR). It describes implemented activities, focusing more on qualitative information[4]. This IR is a public deliverable. The first edition of the IR (D2.2) is due in April 2024 (M18) and the final edition of the IR (D2.3) is due in February 2025 (M28). Depending on their role (Task leader, Format leader, Activity leader) all GenB partners will contribute content.

This document is structured first by task. The five tasks within WP2 are each covered in a dedicated chapter. Chapters are structured by format. The 2-5 formats within a WP2 task are each covered in dedicated sub-chapter. Within each task, up to 5 formats will be implemented, for a total of 17 formats. This yields the following overall document structure:

- Chapter 3 work implemented in T2.1 Inspire and inform young people.
- Chapter 4: work implemented in T2.2 Inspire and inform students in bioeconomy careers.
- Chapter 5: work implemented in T2.3 Educate young people to promote the biotransition.
- Chapter 6: work implemented in T2.4 Educate teachers in teaching the bioeconomy.
- Chapter 7: work implemented in T2.5 Inform and educate other multipliers to promote the bioeconomy.
- Chapter 8: Conclusions

Finally, the Appendices cover:

- Appendix 1 lists Activities (formats), KPI and target groups.
- Appendix 2 lists the geographical distribution of activities (formats)

[4] More quantitative information on implemented activities will be reported continuously in the context of WP6 “Project management” and WP4 “Impact assessment and policy recommendations”. In detailed Excel worksheets, WP6 keeps track of all activities implemented across the project and WP4 keeps track of the fulfillment of Key Performance Indicators (KPIs) associated to GenB activities.

# 3 Inspire and inform young people

Task 2.1 "*Inspire and inform young people on sustainable and circular bioeconomy and bio-based sectors*" will showcase inspirational real-life examples of bioeconomy and bio-based products through the following formats and activities:

- Task 2.1a: Hands-on labs and playful activities in each country
- Task 2.1b: Bioeconomy village at large scale events
- Task 2.1c: Inside the bioeconomy experimental exhibitions
- Task 2.1d: BioArt Gallery at large scale events

Table 3 presents an overview of the Task 2.1 formats/activities to inspire and inform young people on bioeconomy, the countries where activities will be implemented, and the associated KPIs.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| Hands-on labs and playful activities |  | Playful activities and hands-on labs with bioeconomy experiments (including activities like creating biomaterials) | #400 young people | AT, IT, SK, ES, EL, BE, PT, NL |
| Bioeconomy village at large scale events |  | Format promoting bioeconomy in the context of large-scale events to attract interest, raise awareness and stimulate curiosity and discussion | #40.000 people | SK, EL, IT, PT |
| *Inside the bioeconomy* experiential exhibit |  | Bio-based experiential exhibit in existing public spaces | #4.000 people | BE, ES, PT, NL |
| BioArt Gallery (in 9 languages) |  | Formats (large pictures; roll-ups) promoting bioeconomy in the context of large-scale events | #40.000 people | EU |

*Table 3 - WP2 formats to inspire and inform young people on bioeconomy*

Beyond the above formats, that are all foreseen in the GenB GA, APRE developed a new format, *participatory photography*, which aims to narrate, investigate the circular bioeconomy, and activate our gaze on everyday sustainability. The format was piloted in the WP1 Living Lab organised in 2023 at I.C Guicciardini Roma. APRE's experience with developing and piloting the format is described at the end of this chapter.

## 3.1 Hands-on labs and playful activities in each country (T2.1a)

### 3.1.1 Concept of the format/activity and prior experience

**Concept:** Organisation of hands-on labs for kids to actively engage them in experiments with the aim of discovering many uses for bio-waste (e.g. coffee-grounds, orange peels and eggshells), and see how they can be transformed into products such as cleaning scrubs, natural colour, paper, and bioplastic. The labs for kids seek to communicate knowledge of the bioeconomy and bio-based solutions in an easy, experiential, and comprehensive way.

**Inspirational previous experience:** The labs for kids build on experiences like the "Bioeconomy Village" (see section 3.1.2) and the "Bio Art Gallery" (see section 3.1.4) implemented in the BIOWAYS and BIOVOICES projects at large-scale international exhibitions. They also draw from the BIOVOICES book for kids "What's Bioeconomy?" and the associated extensive knowledge sharing and testing that went into creating the book for children. These hands-on activities were deployed in the context of Transition2BIO in different environments and countries, as well as in different contexts and formats, confirming the flexibility and adjustability of the concept and materials available. Ten (10) hands-on experiments were developed using simple materials available from home (the first five experiments can be run with minimal equipment e.g. without a stove/microwave).

The aim of these experimental labs is to raise awareness and facilitate the understanding of bioeconomy through hands-on activities, informing and educating kids about all bioeconomy areas (natural ecosystems, primary production, processing), to produce food, materials, and energy, by touching, feeling, smelling, and exploring the bioeconomy. The goal is to deploy these activities in contexts where the kids and families are already participating (museums, festivals, fairs, school activities, etc.), thus maximising the impact.

The labs for kids are targeted at children aged 5 to 8 years old[5]. However, the hands-on experiments also helped to educate kids' parents, grandparents, teachers, and other adults that participated together with the children in their experiments.

### 3.1.2 Activities implemented in GenB to date

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| Hands-on labs and playful activities |  | Playful activities and hands-on labs with bioeconomy experiments (including activities like creating biomaterials) | #400 young people | AT, IT, SK, ES, EL, BE, PT, NL |

*Table 4 - WP2 format 2.1a: hands-on labs and playful activities in each country - key characteristics*

All GenB partners and all countries are involved in organising "Hands-on labs" and playful activities in their respective countries. They will engage schools and participate in different events related to the bioeconomy and conduct various experiments with children and young

[5] Nonetheless, the experiments can be attractive to individuals of other age classes to. For example, the coffee-scrub is quite popular with teenagers and even adults.

adults (including activities like creating biomaterials). In the case of AIJU and EUN, the organisation will differ slightly, enriching the experience gained in GenB with the hands-on lab concept:

- Rather than in the classroom or at events, AIJU has organised the hands-on labs at its ToyLab Experience (Figure 1), an innovation centre for children that provides a space for the development of workshops and activities related to bioeconomy and sustainability.

*Figure 1 - AIJU ToyLab Experience*

- EUN's target group are teachers and educators working in formal education. In the case of EUN, the hands-on labs will be implemented as a stream in a Scientix-Bioeconomy Award, as part of the 2024 STEM Discovery Campaign (SDC). The award invites all teachers and educators working with students from the ages of 4 to 19 years old in Europe and beyond.

**Implementation findings**

The results of the hands-on labs implemented to data can be summarised as follows:

- Hands-on labs were implemented (i) in the classroom, in collaboration with schools; (ii) in the context of a large national events, (iii) in non-formal education settings, and (iv) as virtual event within the 2024 STEM Discovery Campaign.
- Depending on the main age group targeted and the context, hands-on labs involving different playful activities were implemented. In some countries the topic of the lab/activities was adjusted according to the needs of teachers of specific subjects, like Home Economics and Science. Some hands-on labs were organised in the context of the GenB Living Labs (see D1.2 Report on co-design activities).
- Participants in the hands-on labs are mostly primary and elementary school students (resp. 4-8 years old and 9-13 years old), their teachers and their families. In Portugal, one of the hands-on labs organised by LOBA specifically targeted children from vulnerable groups.
- Examples of implemented playful activities ranged from (a) making seed bombs, (b) making and using paint derived from plants and vegetables as well as from spices, (c) producing bioplastic from orange peels, (d) making biogas from eggshells and vinegar (e) making natural water colours from fruits and vegetable, etc.
- Beyond the hands-on experiments inherited from earlier projects, APRE developed three new hands-on experiments and transformed these into easy-to use educational factsheets.

The new experiments were piloted in Rome in three classrooms and in an open-air large-scale event in the period March-June 2023.

1. Use fruits, vegetables, and spices creatively: make beautiful watercolours!
2. Try to produce your own bio-based plastic from corn starch!
3. Make homemade natural toothpaste!

- The duration of the activity depends on the context. When collaborating with schools, the activity typically lasts up to 2 hours per group of students or classroom. When organised in the context of a "green" event activities are often implemented continuously during the event's opening hours (one or multiple days) (see Figure 2, Figure 3 and Figure 4).


*Figure 2 - Hands-on experiment: make natural watercolours, IC Guicciardini, May 2023, Rome*

*Figure 3 - Hands-on experiment: make natural watercolours, Doposcuola Mammut, June 2023, Rome*

*Figure 4 - Hands-on experiment: make bio-based plastics from corn starch and glycerin, IC Guicciardini, April 2023, Rome.*

In more detail, implementation of the hands-on labs involved the following:

- In **Austria,** ZSI performed a hands-on lab producing bioplastic from orange peels, at the high school AHS Karajangasse in Vienna with a group of 16 and 17 y.o. students. Furthermore hands- on labs were organised in a primary school near Vienna. ZSI together with about 100 6–10 y.o. made seed bombs, painted using paint derived from plants and vegetables as well as from spices, and played the bioeconomy memory game from the Transition2Bio project.
- In **Greece**, the "hands-on lab" concept was organised twice. Firstly, by Q-PLAN in Thessaloniki within a classroom setting in collaboration with the 1st Junior High School of Kalamaria, involving a group of 12 students who immersed in the bioeconomy using three experiments (coffee scrub, natural colour fun and biogas factory in a bottle). Secondly by HSPN in Athens within a small theatre setting in collaboration with the Athens College Bodossaki Elementary School, involving 350 students (2nd, 3rd and 4th graders), in the form an experiential seminar (due to the large number of students), using two experiments (natural colour fun and biogas factory ballon), a bio-based Christmas decorations crafting activity, as well as an audiovisual presentation specifically created by the HSPN educational team targeted to this specific age group.
- In **Italy**, APRE implemented hands-on experiments in 4 classrooms of a primary and low-secondary public school (I.C Guicciardini) in Rome between March and June 2023. This school was chosen for its creativity, good practices, and sensitivity towards environmental sustainability issues. Moreover, APRE realised the activity in an afterschool open air event (non- formal learning setting), also in Rome, with ca. 50 kids of primary age group and their families in a disadvantage educational setting. The following experiments were developed: Bioplastic from oranges, Bioplastic from milk, Bioplastic from eggs, Biodegradable bag, Cabbage experiment and Natural water colours (Figure 5).

*Figure 5 - Hands-on experiments conducted at I.C Guicciardini in Rome between March and June 2023*

- In March 2024, APRE and FVA, together with ScienzaInsieme and Cluster Spring, coordinated the Rome edition of the Italian Bioeconomy Changemakers Festival, organised by the European Commission (EC) in Brussels between 11 and 17 March 2024, in collaboration with Lazio Innova and Unitelma Sapienza. Ahead of the event, FVA trained the eight FabLabs of Lazio Innova on how to implement hands-on activities. The GenB training enabled the FabLabs in turn to involve some 200 high school students and teachers, originating from the whole Lazio region, in IBCF events. Moreover, on 23 March 2024, FVA organised a hands-on lab with kids aged 7-12, in the context of the SOUx – the School of Architecture for Kids based in Taranto, Apulia Region (Figure 6). In this case, the 16 participating kids were engaged in the creation of bioplastics from bio-based residues.

*Figure 6 - Kids at SOUx (Taranto) engaged in the creation of bioplastics from bio-based residues*

- In **Portugal**, LOBA implemented one hands-on lab in March 2023 in the context of the National Consumer Meeting which saw the participation of schools targeting children from vulnerable groups from north Portugal. The format of the labs was "Natural Colour Fun", consisting in using cabbage, vinegar, and soda to create a natural purple colour and "Biogas Factory Ballon", consisting in using water, brewer's yeast, and water to inflate a plastic balloon. The formats stem from Transition2BIO project and have been tested in the past by LOBA. For this reason, the same formats were replicated in the context of the Bioeconomy Changemakers Festival – Aveiro edition in March 2024, organised in conjunction with the Portuguese 17th National Mathematical Games Championship which saw the participation of 1800 students ranging in age from 7 to 18 old in total.
- In **Slovakia**, the hands-on labs were a key part of the living lab activities realized in cooperation with the Gessayova Leisure Centre in Bratislava. In cooperation with schools, experiments -adopted from the Transition2BIO project- focusing on the production of seed bombs for pupils of 3 classes of primary and elementary schools in Bratislava were carried out in April – May 2023. Due to the success of these activities, the experiments (making flower bombs and scrubs from coffee grounds) became part of the workshop on the occasion of Earth Day, organized by the Gessayova Leisure Center for young people aged 6-15 years. Experiments (painting with natural colours, production of peeling from coffee grounds, production of cosmetic tampons from waste textile from natural materials) were also included in the programme of the March 2024 Bioeconomy Changemakers Festival in Nitra, where mainly pupils aged 8-9 years and 12-13 years participated.
- In **Spain**, AIJU conducted two hands-on workshops in its ToyLab Experience, with a total of 50 students in the second year of primary school, aged 8-9 years old. The workshops took place on 22 and 25 March 2024 and lasted two hours. The main activity was focus on making homemade biogas (Figure 7). It was made with eggshells and vinegar. The

children were able to create biogas and see how the balloons that were placed in their bottles inflated after the chemical reaction.

*Figure 7 - Hands-on lab conducted in Spain.*

In this context, AIJU launched the bioeconomy researcher's notebook, a friendly technique to collect pre- and post-feedback from participating children. The notebook is made up of the pre-activity and post-activity questionnaires set out in WP4. Through storytelling, children are informed that they are bioeconomy researchers and that their opinion will be vital to improve the materials and activities that are developed within the framework of the GenB project. Thus, participants are invited to complete the notebook during the workshop. The notebook is structured clearly, with ordered questions and language adapted to the target. It is very visual and attractive, as it is accompanied by images that illustrate the concepts. Regarding the scales used, the typical Likert scale is replaced by a scale with emoticons. This proposal is widely accepted in the academic world as the most appropriate for the age target with which we are working (Figure 8). This material has been made known and shared with the rest of the members in case they find it interesting for their events and activities.

*Figure 8 - A child fills out the bioeconomy researcher's notebook.*

- Finally, working at the **pan-European level** EUN instructed the participants of the 2024 STEM Discovery Campaign (SDC) to (i) implement different hands-on activities based on materials available in the GenB Virtual Library; (ii) write an implementation story reporting the activity; and (iii) post it to the 2024 STEM Discovery Campaign. This activity is ongoing at the time of writing (mid-April 2024). So far, more than 10 participants indicated that they have conducted different hands-on activities with students.

Table 5 - WP2 format 2.1a: Hands-on labs and playful activities in each country - planned and implemented activities. It gives a short overview of the main hands-on labs that are implemented or planned.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| ZSI | Austria | Vienna | Apr-May '23 | Classroom at AHS Karajangasse (secondary school) and VS Südtstadt (primary school) | I |
| HSPN | Greece | Athens | 15 Dec '23 | Classroom at Athens College Elementary School | I |
| | | Athens | 20-21 Apr '24 | Open event At Athens Science Festival | PI |
| Q-PLAN | Greece | Thessaloniki | 28 Nov '23 | Classroom at Junior High School | I |
| APRE | Italy | Rome | Mar-Jun '23 | Classrooms at ICG, Open events at Doposcuola | I |
| APRE & FVA | Italy | Rome | Feb '24 | Satellite event Bioeconomy Changemakers Festival | I |
| FVA | Italy | Taranto | 23 Mar '24 | Classroom at SOUx | I |

| | | | | | |
|---|---|---|---|---|---|
| BTG | Netherlands | Zutphen | 1 May '24 | Open event at Expeditie Next | Pl |
| LOBA | Portugal | Aveiro | Oct '23 | Open event at Planetiers | I |
| | | Aveiro | Mar '24 | Satellite event Bioeconomy Changemakers Festival | I |
| PEDAL | Slovakia | Various | All the time | Classrooms | I |
| | | Various | All the time | Open events | Pl |
| AIJU | Spain | Valencia | March '24 | AIJU ToyLab experience | I |
| EUN | Pan-European | Various | Feb-Apr '24 | 2024 SDC | Ip |

*Table 5 - WP2 format 2.1a: Hands-on labs and playful activities in each country - planned and implemented activities. *: Status: Ip = In progress; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 8 |
| Countries with implementation (largely) completed | 6 |
| Countries with ongoing or planned implementation | 4 |
| Events implemented | 10 |
| Participants engaged | >1500 (including 114 in AT, 941 in GR, 195 in IT, 61 in PT, 218 in SK and 50 in ES). |
| Targets to be engaged | 400 young people |

*Table 6 -WP2 format 2.1a: Hands-on labs and playful activities - impact against KPI*

From the above two tables (on Activities and on Impact) it can be seen that **the implementation of this task is not fully completed**. Several GenB partners foresee implementing additional events. The overall KPI has already been achieved successfully.

### 3.1.3 Main lessons learned

**General insights on the format**

The experiments cover crucial topics like waste prevention, climate change, and renewable resources, fostering discussions on these topics with younger generations. These hands-on activities are easily replicable at home or school and can be integrated into larger initiatives like awareness campaigns and teacher training. They can be conducted in various settings, from large scale events to classrooms, and can be presented in diverse formats (live or online) to adapt to different learning styles. Providing bio-based containers for children to take home their outputs enhances engagement and reinforces the sustainability of these activities. Integrating hands-on labs with a "Bioeconomy Village" booth attracts more visitors and sparks curiosity about bio-based materials. Online delivery, combining exhibitions with interactive activities, enhances student engagement but requires careful organization and management to maintain attention. Hands-on labs have proven to be effective also with very young kids or disadvantaged

groups (like in Taranto, Italy Gaio, Portugal), fostering inclusion and awareness through the valorisation of their capacities and creativity. Dedicated hands-on activities for teenagers or young adults (like do-it-yourself bioplastics) can be used to inspire and stimulate the discussion about bioeconomy.

**Specific insights on the format**

Note that various of the insights below are relevant in all WP2 formats.

1. **Children from different age groups respond differently** to the concepts of bioeconomy and bio-based products. Younger children (7-8 y.o.) were very enthusiastic about the experimental procedure and the direct outcomes they witnessed. Older children (8-9 y.o.), even though equally enthusiastic about the experiments, were more curious about the results and applications of the processes. 4th graders showed a better understanding of bioeconomy from an economic aspect and not just an environmental point of view; some even expressed their own business and management ideas revolving around biobased products and renewable energy. The ideas of bioeconomy and its applications, when presented in fun and engaging ways, and accompanied with the enhancement of discussion and participation, can steer imagination and incentivise youngsters to learn more and become more active about environmental issues.
2. **Take advantage of interactive multimedia:** In larger events, an audiovisual presentation can be effective in conveying the basic ideas of bioeconomy and renewable energy in a simplified and relatable way (concepts presented through the eyes of an environmentally sensitive 1st grader, Rita). Including interactive elements like animation and music kept the AV presentation from becoming stiff, and stirred conversation between HSPN members, teachers, and children, resulting in several vivid Q&A sessions regarding bioeconomy and environmental awareness. The combination of conventional lecture-based approaches with multimedia (visual and auditory) elements and experiential learning can be effective in conveying elaborate and composite concepts in a way that captures attention and facilitates retention through dynamic content, catering to different audiences and learning styles, especially small children, and educators.
3. **Make a connection to the season of the year:** The inclusion of a Christmas angel ornament crafting activity, introduced the students to the concepts of using bio-based materials, repurposing old materials, and reducing waste, while at the same time engaging them in a fun, holiday-related activity and gave them the chance to create something they could take home, show their parents, and hang on the Christmas tree. Moreover, some of the students suggested making big batches of them to sell on the Christmas bazaar of the school, perfectly connecting the event with a bioeconomy activity undertaken by the students.
4. Interactive activities for children provide opportunities for youngsters to step out of their comfort zone, emerge as group leaders and overall change the classroom dynamics.
5. **Enhance technical definitions with examples that resonate or intrigue the target audience**. Besides adjusting the vocabulary, intonation, and structure of our discourse to convey technical concepts effectively to the target, it's crucial to **use examples** that vividly illustrate the ideas discussed, making them relatable and engaging. Therefore, when discussing

concepts like bioeconomy, biogas, or materials and objects produced in a bioeconomy context, one should always aim to provide examples that are familiar to children's everyday experiences (e.g.: *Did you know that toys can be crafted from corn cobs? Were you aware that your sneakers could be manufactured from recycled plastic bottles?*) or intriguing examples (e.g.: *Did you know we can create school notebooks using elephant or horse dung paper?*). This approach not only facilitates a better comprehension of the underlying technical concepts but also sparks greater interest in learning and enhances the likelihood of knowledge dissemination to others.

6. **Transform uninteresting tasks for children into appealing and child-friendly proposals through play.** In the framework of the hands-on workshops, an A5 notebook has been developed containing the pre and post questionnaires required by the project in WP4. It was given to each participant at the beginning of the session. It is presented to the participant as a "bioeconomy expert notebook" and they are invited, through storytelling, to actively participate in the evaluation and improvement of the activities. This type of notebook is one of the resources used by AIJU's child user research area to, among other objectives depending on the research objectives, generate commitment to participation in tasks that may initially generate rejection in the target group.
7. Organisers need to incorporate relatable examples in the experiments' narrative that build upon the sustainability concepts that students already know from home or school and encourage students' participation in the conversation. There has been no chance to implement this knowledge in other activities/ formats yet.
8. Prior and **structured organization** is essential to conduct the experiments, especially in large-scale events or unstructured learning settings.
9. The experiments should be **tested** prior to being implemented. This practice helps to avoid difficulties or uncertainties stemming from unclear instructions and ensures better preparation for a successful lesson.
10. The **three new experiments** have been very effective in involving young people (of different age groups) and their educators. They require minimal equipment and are very easy to replicate. The watercolor experiment, especially, has sparked a lot of interest in both young kids as well as their parents and teachers, who were attracted to this innovative yet very simple format.
11. The hands-on lab requires the use of single-use plastics and materials to conduct the experiments in a clean and safe environment for the children (plastic gloves, wet wipes, paper etc.). Moreover, the concept entails food waste (e.g. lettuce, coffee, milk, etc.) when demonstrating the experiments. In future implementations, zero-waste or low waste processes shall be explored to keep the message of sustainability intact. This insight is relevant to all WP2 formats, i.e. it was applied in the organisation of the career info day (T2.2), including efforts on minimising the use of printed materials and food waste on catering.
12. **Managing participant engagement in specific environments:** The physical environment impacts participant engagement; consider this when planning sessions. Before the implementation of the hands-on experiments, a discussion session had been planned in the

**Commentato [f1]:** Secondo me è spiegato meglio sopra (pag. 28) come si trasforma una task non d'interesse per i bambini in una che sia per loro familiare

same room that the hands-on activities would later take place. When the participants got into the room which was already set-up for the hands-on experiments, "get their hands dirty". Therefore, it was somewhat challenging to keep the participants' attention during the introduction session which was held right before the hands-on experiments. Having this session in a separate room would have probably increased the participants' attention.

13. **Flexibility in timing:** Recognize the importance of flexibility in workshop timing especially for a station-based hands-on experiment set-up. The strict schedule based on the available time, number of participants and stations can make stations and activities demanding. Allowing more time for each segment would lead to a smoother and less stressful experience for both the moderators and participants.
14. **Designate a timekeeper:** Designating a moderator as timekeeper and overseer is crucial to maintaining the flow and timing of activities in a station-based setting for hands-on experiments. This ensures that each station is adequately managed, and participants stay on track.
15. It is recommended to combine hands-on labs with the Bioeconomy Village format, to provide students with immediate information and tangible materials they can refer to, when learning about the bioeconomy.

## 3.2 Bioeconomy village at large scale events (T2.1b)

### 3.2.1 Concept of the format/activity and prior experience

**The concept of the format/activity**

The bioeconomy is closer to us than it seems at first glance. The aim of Bioeconomy Village is to show through various products and materials that it is in fact part of our daily lives. The collection allows visitors to look, touch, smell or even taste the bioeconomy and present sustainable bio-based alternatives to the things we commonly use.

The original Bioeconomy Village showcases more than 350 different bio-based items. Based on previous experience, the Bioeconomy Village format proved to be an effective element in different types of events, including the large-scale events. At this type of event attractive presentation Bioeconomy Village (e.g., the use of a cardboard installation simulating rooms in a household with samples) attracts visitors to the project booth.

For the event organizers, it also serves a good starting point for discussions not only to familiarize visitors with the bioeconomy, but also about more complex topics – such as the benefits but also risks of the bioeconomy or sustainable lifestyle.

**The prior experience (prior to GenB) with the concept**

Prior to GenB, the Bioeconomy Village has already been exhibited in >40 events directly involving >120,000 people in six countries (IT, BE, PT, SK, GR, DE) in the last 5 years. The Bioeconomy Village was tested within the BIOWAYS, Biobridges and Transition2BIO projects in various types of events or contexts. An unexpected positive effect of the COVID pandemic was the creative approach to these events, when the project partners tested the Bioeconomy Village

at large-scale events, but also smaller events, in some cases directly in schools, with more or less strict anti-epidemic rules, organized indoors, under the open sky, or even online.

The strength of the format is that it is suitable for events without a fixed agenda and therefore without the possibility to prepare structured (educational) activities. It allows visitors to discover and organizers to respond flexibly to current questions and interest to visitors.

### 3.2.2 Activities implemented in GenB to date

The **Bioeconomy Village** format refers to a furnished exhibition booth featuring a large collection of bio-based products, supplemented as relevant with a collection of roll-up banners and other materials informing on the bioeconomy and bio-based products. The fully equipped booth, or parts thereof, can be showcased at exhibitions and large-scale events, enabling visitors to experience, touch and feel the bioeconomy thus attracting interest, raising awareness, and stimulating curiosity and discussion. The full collection of more than 350 different bio-based product samples in every day's life application, or a selection of these, can be shown in classrooms as part of a bioeconomy narrative.

The Bioeconomy Village will be designed to create a fun and immersive experience for participants. It will feature interactive exhibits that showcase the latest innovations in the field of bioeconomy, such as biodegradable packaging or bio-based textiles. In combination with two other GenB formats (hands-on labs, sub-task T2.1a, discussed above, and roll-up banners, sub-task T2.1d, discussed below) an engaging and green "corner" can be created attracting young students and families with practical and informative activities. The goal will be to educate students and teachers about the principles of bioeconomy, the potential of bio-based products and materials, and the importance of sustainability. Target groups include elementary school students (9-13 years old), high school students (14-19 years old) and their parents.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| Bioeconomy village at large scale events |  | Format promoting bioeconomy in the context of large-scale events to attract interest, raise awareness and stimulate curiosity and discussion | #40.000 people | Greece<br>Italy<br>Portugal<br>Slovakia |

*Table 7 -WP2 format 2.1b: Bioeconomy village at large scale events - key characteristics*

GenB partners from three (3) countries (Italy, Portugal, and Slovakia) implemented the Bioeconomy Village in their respective countries. All of them (APRE, FVA, LOBA and PEDAL) have done so already. In addition, they organised a local edition of the Bioeconomy Village as a satellite event of the Bioeconomy Changemakers Festival. Showcasing examples of bio-based products used in everyday life enabled the visitors to touch and feel the bioeconomy.


*Figure 9 - Bioeconomy village at the Italian Changemakers Festival - Rome edition with the GenB Ambassadors*

- APRE implemented the Bioeconomy Village in two classrooms (primary and elementary) of the I.C. Guicciardini school (Rome), as integrating and supporting activities in the Living Labs and showcased the bioeconomy during the open school Sustainability Day (May 2023) to the entire school community, parents and external stakeholders. The activities will be repeated during the European Researchers' Night 2024


*Figure 10 - Bioeconomy village at the Sustainability Day of the I.C. Guicciardini school*

- in Slovakia, Bioeconomy Village was used in combination with other formats, e.g. the hands-on labs in the living-lab activities (see Section 3.1). Besides those mentioned in the referenced section, 2 more workshops were organized (2 workshops targeting the age group 15-19, one in Bratislava, one in Žilina). The Village was a part of shorter events and was a valuable element. For young people, for whom the bioeconomy was a new concept, it represented something graspable that helped to clarify the theory, but also to move on to more complex topics.
- Bioeconomy Villages were (or will be) organised in the context of "green" large-scale events, for example targeting science (Athens Science Festival in Greece, European Researchers' Night in Italy), sustainable innovation (Planetiers in Portugal), circular economy (Circular Summit in Slovakia) or community-oriented learning in general (Maker Faire in Italy).

- FVA (Italy) is the owner and keeper of a comprehensive collection of bio-based products. The complete collection includes more than 350 different bio-based product samples. Different sets with smaller product collections (containing ca. 30-40 bio-based products) can be borrowed from other GenB partners that participated in the EU-funded Transition2Bio project. In 2023 FVA and APRE have implemented the activity in the Maker Faire, European Researchers' Night Satellite event and Italian Bioeconomy Changemaker Festival-Rome Edition.
- Depending on the local situation and logistics, a sub-set of the full collection of bio-based products can be put on display e.g. products related to a certain theme or topic.
- The duration of a Bioeconomy Villages is usually between one and three days.

Table 8 - WP2 format 2.1b: "Bioeconomy village" at large scale events - planned and implemented activities. gives a short overview of the Bioeconomy Villages that are implemented or planned.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| Q-PLAN | Greece | Athens | 16-21 Apr '24 | Athens Science Festival | PI |
| APRE | Italy | Rome | Mar '23 | Classrooms at ICG | I |
| | | Rome | May '23 | Sustainability Day at ICG | I |
| APRE FVA | Italy | Rome | Oct '23 | Maker Faire | I |
| | | Frascati | Sep '23 | European Researchers' Night | I |
| | | Rome | Mar '24 | Satellite event Bioeconomy Changemaker Festival | I |
| APRE | Italy | Rome | Sep '24 | European Researchers' Night | PI |
| FVA | Italy | Frascati Sep '24 ERN | PI | | |
| LOBA | Portugal | Aveiro | Oct '23 | Open event at Planetiers | I |
| | | Aveiro | Mar '24 | Satellite event Bioeconomy Changemakers Festival | I |

| | | | | | |
|---|---|---|---|---|---|
| PEDAL | Slovakia | Bratislava | Since Mar '23 | Workshops in classrooms | I |
| | | Žilina | Since Mar '23 | Workshop | I |
| | | Nitra | Since Mar '23 | Satellite event Bioeconomy Changemakers Festival | I |

*Table 8 - WP2 format 2.1b: "Bioeconomy village" at large scale events - planned and implemented activities.*): Status: Ip = In progress; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 4 |
| Countries with implementation (largely) completed | 3 |
| Countries with ongoing or planned implementation | 2 |
| Events implemented | 10 |
| Participants engaged | Ca. 4000 (including 3120 in IT, 535 in PT and 307 in SK) |
| Targets to be engaged | 40.000 people |

*Table 9 -WP2 format 2.1b: Bioeconomy village at large scale events - impact against KPI*

From the above two tables (on Activities and on Impact) it can be seen that **the implementation of this task has not been completed**. Several GenB partner foresee implementing additional events. This will help reaching the KPI in time (by 28 February 2025 the latest).

### 3.2.3 Main lessons learned

The exposition of bio-based products has proven to be an effective format, on the one hand to attract visitors (from children to families) at large-scale events, curious to know what the exposition is about, on the other, as complementary activity to provide participants with a tangible idea and memory of the potential benefits and concrete implementation of the bioeconomy. Learning what the sustainable and circular bioeconomy is, followed by being able to touch and experience concrete bio-based products, keeps a high engagement and overall understanding of students throughout the activities.

The Bioeconomy Village format shall preferable be used in combination with other interactive formats and activities (e.g., the hands-on experiments, discussed in Chapter 3.1, providing students with immediate information and tangible materials they can refer to, when learning about the bioeconomy). The bio-based product collection, a legacy of GenB predecessor projects, has proven to be a great tool for increasing the interest of visitors of all ages in further

activities. Products from non-traditional or innovative biomass sources (e.g. elephant dung) help arise the curiosity of participants. Therefore, it is strongly recommended to ensure presentation of such items in the partners' activities.

In addition, it is advised to have a collection of items produced and/or available in their country or even region. This way it is possible to show how bioeconomy can inspire adoption of sustainable lifestyle.

## 3.3 Inside the bioeconomy experimental exhibitions (T2.1c)

### 3.3.1 Concept of the format/activity and prior experience

**Concept:** Organisation of an exhibition that will inspire and inform children and young people on bioeconomy by attracting their interest, raising awareness, and stimulating curiosity and discussion. This format brings inspirational real-life examples of the bioeconomy and of bio-based products (e.g. for use in every day's life applications) to the public space, enabling the visitors to touch and feel the bioeconomy.

**Inspirational previous experience:** The concept of exhibiting bio-based products is not new and has been applied in various earlier EU projects, also by members of the GenB consortium. An exhibition targeting children and young people, where bioeconomy is "injected" into a larger setting in a public space, other than a school or a large-scale event, and that last longer than a few days, is much less common, and something GenB seeks to help pioneer across Europe.

The idea of the experimental exhibition is to conceptualise and implement a format that does not only build on the legacy of earlier EU-funded bioeconomy awareness raising projects but goes beyond what is already available. The purpose of the experimental exhibition, however, is very much alike i.e. to immerse children and young people in the interesting world of bioeconomy to increase their knowledge about bio-based processes, materials, and innovative applications.

The aim is to implement the exhibition, and to inject bioeconomy, in a public space (such as science centre/exhibition, library, city hall, community centre, etc.), other than a school or a large-scale event. Depending on the context, the experimental exhibition may be focused on specific themes/topics. Typically, the exhibition would be on display for several weeks or months.

Target groups include pre/early students (4-8 years old), elementary school students (9-13 years old), secondary school students (14-19 years old), their families and multipliers.

### 3.3.2 Activities implemented in GenB to date

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| *Inside the bioeconomy* experiential exhibit |  | Bio-based experiential exhibit in existing public spaces | #4.000 people | Netherlands<br>Portugal<br>Spain<br>pan-European |

*Table 10 - WP2 format 2.1c: Inside the bioeconomy experimental exhibitions - key characteristics*

Partners from four (4) GenB countries (Netherlands, Portugal, Spain, and pan-European) will organise their own version of an experimental exhibition. As the format includes new elements, that GenB partners need to design and develop, no experimental exhibition has been implemented to date.

In **The Netherlands**, BTG developed a close collaboration with the educational museum Museon-Omniversum in The Hague. Central element in the collaboration is the joint development of a circular, bio-based exhibition, that will become part of the permanent exposition at this museum. Some sensitive objects will be displayed for viewing only, whereas other exhibits can be smelt, touched, etc.

BTG supports MUSEON as technical expert, and helps identifying relevant types of biomass feedstock, objects, and candidate product suppliers. BTG also provides background/technical information, which the team at MUSEON uses as base for public-friendly communication materials. Linked with the exhibits collection, BTG is developing a quartet game targeting the age group 13-18 years old. The development of the exhibition is in progress.

**Pan-European**: Considering the target group and beneficiaries of EUN activities, the experimental exhibition is being organised in accordance with the available resources and capacities, enriching the experience gained in GenB with the experimental exhibition concept. EUN is implementing the activity as an online exhibition of bioeconomy-related educational activities compiled during the 2024 STEM Discovery Campaign. The activities vary in format and range from new materials developed, activities implemented or attended by the participants of the 2024 SDC. The exhibition is in progress.

Table 11 -WP2 format 2.1c: Inside the bioeconomy experimental exhibitions - planned and implemented activities. gives a short overview of the experimental exhibitions planned by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| BTG | Netherlands | The Hague | Summer '24 | (Permanent) Museum exhibition at Museon | Ip |
| LOBA | Portugal | Gaia | '24 | "1º ciclo" schools of the municipality of Gaia | Pl |
| AIJU | Spain | Valencia | '24 | Education centres | Pl |
| EUN | Pan-European | Various | Feb-Apr '24 | 2024 SDC | Pl |

*Table 11 -WP2 format 2.1c: Inside the bioeconomy experimental exhibitions - planned and implemented activities.*: Status: Ip = In progress; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 4 |
| Countries with implementation (largely) completed | 0 |
| Countries with ongoing or planned implementation | 4 |
| Events implemented | 0 |
| Participants engaged | 0 |
| Targets to be engaged | 4.000 people |

*Table 12 - impact against KPI in each country.*

From the above two tables (on Activities and on Impact) it can be seen that **implementation of this task is at the planning stage.** No targets groups have been reached yet (actual KPI = 0). No problems are anticipated reaching the KPI in time (by 28 February 2025 the latest).

### 3.3.3 Main lessons learned

As the work on the experimental exhibition is in progress, and none of the experimental exhibition have been completed at the time of writing (mid-April 2024), it is considered too early to draw firm conclusions on the suitability and effectiveness of this format.

## 3.4 BioArt Gallery at large scale events (T2.1d)

### 3.4.1 Concept of the format/activity and prior experience

**Concept:** BioArt Gallery is a visually impressive presentation (large-size pictures, stand-alone cardboard panels or roll-up banner) of biomass sources and their applications. It contains information on traditional and well-known, but also new and promising biomass sources and presents examples of their tried and tested as well as innovative uses in products that are part of our lives – such as agriculture products, cosmetics and nutraceuticals, construction and restoration, cleaning and hygiene; design and clothing; toys and sporting goods.

These materials can be used separately as an exhibition showcasing to the public some examples of bio-based products and applications currently available in the market. However, it is well combined with other formats and activities. The original BioArt Gallery consisted of 16 thematic compositions of large-size pictures (64 panels in total), covering all bioeconomy sectors. In the next steps, it was extended and currently included additional 27 roll-up banners, presenting different types of biomass feedstock and its applications. An interactive online version is also available. This allows the event organizer to select the materials that are most thematically related to the theme of the event.

**Inspirational previous experiences:** Similarly, as the Bioeconomy Village, the BioArt Gallery has been tested and exhibited in more than 50 different events, reaching 200,000 people before the GenB project.

As mentioned above, it is a flexible format and is a well-combinable format. It can be presented as a solo exhibition. At the same time, the Gallery is a quality supporting material for various types of presentations, when the visual material complements the presented topic. For example, during the Transition2BIO project, it was often used in combination with the Bioeconomy Village, educational games and quizzes or activities, such as the hands-on labs.

### 3.4.2 Activities implemented in GenB to date

The BioArt Gallery consists of an exhibition of thematic compositions of large-size pictures and roll-up banners related to the bioeconomy. The BioArt Gallery is a powerful tool to attract interest, raise social awareness, inspire, and stimulate curiosity and discussion, e.g. among children and adolescents.

The roll-up banners are available in various language versions from earlier EU-funded projects. The collection of banners was originally developed in the BioVoices projects and subsequently expanded in the Transition2Bio project. The current collection of roll-up banners consists of 16 thematic compositions of large pictures (64 panels in total) with high visual impact covering all bioeconomy sectors. An online version of the BioArt Gallery is also available (in English).

For use in the GenB project, GenB partners will select the large-size images and roll-up banners that are likely to attract the most interest among children and will translate and print them. This may involve designing and developing roll-up banners covering additional bio-based feedstocks/products.

For maximum impact, the roll-up banners can be applied in combination with other Task 2.1 formats, particularly the hands-on labs (sub-task T2.1a, discussed above) and the Bioeconomy Village (sub-task T2.1b, also discussed above).

All partners and all countries are involved in organising the BioArt Gallery at large-scale events in their respective countries. The roll-up banners can serve to inform all GenB target groups but will primarily target elementary school students (9-13 years old), high school students (14-19 years old), their teachers and other multipliers.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| BioArt Gallery (in 9 languages) |  | Formats (large pictures; roll-ups) promoting bioeconomy in the context of large-scale events | # 40000 people | AT, IT, SK, ES, EL, BE, PT, NL, EU |

*Table 13 - WP2 format 2.1d: "BioArt Gallery" at large scale events - key characteristics*

As EUN only works with teachers and educators, in their case the BioArt Gallery is organised slightly differently, enriching the experience gained in GenB with the BioArt Gallery concept.

EUN is implementing the activity as one of the streams of the Scientix-Bioeconomy Award in the context of the 2024 SDC. Participants are instructed to develop a BioArt Gallery related to the bioeconomy and feature it in their school or community. Teachers and educators were free to decide on the format, location and what would be included in the gallery display, whilst EUN provided them with materials and guidelines within the information about the Award. The BioArt Gallery is in progress.

ZSI participated at the **Austrian** Bioeconomy Summit on 7 November 2023, where the participants had the opportunity to explore the BioArt gallery online. Furthermore, ZSI gave the participants of the GenB Living Lab with 14-19-year-olds the opportunity to go through the BioArt Gallery on their devices.

The BioArt Gallery has been implemented in **Greece** numerous times by Q-PLAN and HSPN. Specifically, Q-PLAN has incorporated the BioArt Gallery in two WP2 concepts: T2.1a "hands-on lab" organised for students aged 11-12 and T2.2c "bioeconomy career info days" that engaged older students (mostly undergraduates 18-19 years old) and other ecosystem actors from education, business, academia, NGOs, and the public sector. Future implementations of the BioArt Gallery will be explored in large-scale events to maximise the impact of this activity (e.g. Researchers' Night 2024, Green Wave Expo, etc.). HSPN has implemented the BioArt Gallery within the context of the ForwardGreen Expo (large scale event) in Thessaloniki in collaboration with the Green Key Greece Programme of the FEE, with Q-PLAN's support. The event was addressed to bioeconomy and circular economy industry entrepreneurs and professionals. The rollup poster presented alternative product ideas deriving from insects. Furthermore, the format was implemented during an educational and informational visit to the Mediterranean College of Athens School of Tourism and Hospitality, where the GenB Ambassadors action was presented to the students and teachers, and it is planned to be implemented during 4 more visits to Tourism schools in several areas of Greece throughout April 2024. The rollup poster presented the importance and proposed biomass usage for *Posidonia oceanica*. The BioArt Gallery will also be exhibited during the HSPN's participation in the Athens Science Festival along with Bioeconomy Village.

*Figure 11 - Exhibition of BioArt Gallery in Greek events: hands-on lab (top), ForwardGreen Expo (bottom - left), Career Info Day (bottom - right)*

In **Italy**, APRE implemented the BioArt Gallery in the I.C Guicciardini school Rome (primary and elementary level), displaying the gallery in the school for 4 months and in the occasion of the open day "Sustainability Day" (May 2023) engaging more than 500 people. In addition, BioArt Gallery has been replicated in Assobiotec and Cluster Spring (Bioeconomy Day) leading multipliers in an step-by-step educational pathways towards the gaining of the main concepts of the bioeconomy. In addition, APRE and FVA jointly implemented the BioArt Gallery in the context of the Italian Bioeconomy Changemakers Festival – Rome Edition, which was organised at Spazio Europa, showcasing many thematic panels covering all sectors of the bioeconomy both in the plenary room and in the exhibition areas. The exhibition engaged around 90 high school students and teachers (see pictures below).


*Figure 12 - Exhibition of BioArt Gallery at Italian Bioeconomy Changemakers Festival – Rome Edition*

In **Portugal**, LOBA used the BioArt gallery in the National Consumer Meeting at the Parque Biológico de Gaia (March 2023) and large-scale event such as Planetiers World Gathering (October 2023) as complementary activity to the Bioeconomy Village: once participants were informed about what the exposed bio-based products were, the most interested ones willing to know more about biological feedstocks and the potential bio-based products that can be produced from them could get valuable information from the Gallery.

In **Slovakia**, BioArt Gallery was used in combination with hands-on labs activities (see hands-on labs), as a part of the (i) living lab activity, (ii) workshops in events, such as the Earth Day or a workshop organized by the Žilina region, (iii) during the Bioeconomy Changemakers Festival, Nitra edition. In addition to that, the BioArt Gallery was also presented in the first Circular Summit in Slovakia (February 2024), complemented by product samples of the members of the Circular Slovakia platform, reaching an audience consisting of SMEs, researchers, policy makers, civil society.

*Figure 13 - BioArt Gallery in the Bioeconomy Changemakers in Slovakia*

Table 14 - WP2 format 2.1d: BioArt Gallery at large scale events - planned and implemented activities. gives a short overview of the BioArt Gallery organised and planned by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| ZSI | Austria | Vienna | 7 Nov '23 | Bioeconomy Summit, National event | I |
| | | Vienna | 19 Apr '23 | Classroom | I |
| HSPN | Greece | Thessaloniki | 7-9 Mar '24 | Large scale event at Green Key Greece (FEE) | I |
| | | Athens | 21 Mar '24 | BCA College Greece | I |
| | | Rhodes | 4 Apr '24 | Informational visit at ASTER | I |
| | | Crete | 14-15 Apr '24 | Informational visit at ASTEK | PI |
| | | Athens | 16-21 Apr '24 | Athens Science Festival | PI |
| Q-PLAN | Greece | Thessaloniki | 28 Nov '23 | 1st Junior High school Kalimaria | I |
| | | Thessaloniki | 14 Mar '24 | OK!Thess | I |
| APRE | Italy | Rome | 25 May '23 | Assobiotec and Cluster Spring (Bioeconomy Day) | I |
| | | Rome | 31 May '23 | Sustainability Day 2023 at ICG | I |

| | | | | | |
|---|---|---|---|---|---|
| | | Rome | Feb – March '23 | IC Guicciardini school (Rome) | I |
| FVA and APRE | Italy | Rome | 14 Mar '24 | Satellite event Bioeconomy Changemakers Festival | I |
| BTG | Netherlands | Zutphen | 1 May '24 | Festival Expeditie Next | Ip |
| | | Groningen | Oct '24 | Kleer'nZooi XXL | Pl |
| LOBA | Portugal | Aveiro | Mar '23 | National event Planetiers | I |
| | | Aveiro | Oct '23 | National consume day at University of Aveiro | I |
| PEDAL | Slovakia | Bratislava | All the time | Leisure centre Žilina (x4) | I |
| | | Žilina | Mar '23 | Žilina Self-governing region | I |
| | | Bratislava | Feb '24 | Circular Summit Slovakia | I |
| | | Nitra | Mar '24 | Satellite event BCF | I |
| AIJU | Spain | Alicante | SY '23-'24 | AIJU ToyLab Experience and Science Park from Miguel Hernández University | Pl |
| EUN | Pan-European | Various | Feb-Apr '24 | 2024 SDC | Ip |

*Table 14 - WP2 format 2.1d: BioArt Gallery at large scale events - planned and implemented activities.*: Status: Ip = In progress; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 8 |
| Countries with implementation (largely) completed | 6 |
| Countries with ongoing or planned implementation | 4 |
| Events implemented | 11 |
| Participants engaged | More than 4.000 (including 18 in AT; 2.467 in GR, 1.090 in IT; 565 in PT and 323 in SK) |
| Targets to be engaged | 40.000 people |

*Table 15 -WP2 format 2.1d: BioArt Gallery at large scale events - impact against KPI*

From the above two tables (on Activities and on Impact) it can be seen that **the implementation of this task has not been completed**. Several GenB partner foresee implementing additional events. This will help reaching the KPI in time (by 28 February 2025 the latest).

### 3.4.3 Main lessons learned

Good attention drawer and conversation starter: The BioArt Gallery creates an atmosphere and tunes visitors to the topic of bioeconomy. The Gallery presents scientific and economic concepts in a way that is attractive and friendly to viewers from all types of audiences. The infographics

(roll-ups) attract the attention of young students and experienced professionals alike. The roll-up banners can be very effective and attention-grabbing when used within the context of other WP2 activities. Event visitors can stop by and explore the content of the materials.

- This was illustrated in Greece where during the Forward Green Expo, professionals from circular economy sectors were engaged in discussing alternative uses of non-conventional biomass (e.g. protein from insects). Furthermore, the 1st year students at the Mediterranean College were impressed by the possible uses of the *Posidonia oceanica* biomass. This rollup poster was specifically selected for the target audience, as Tourism as a sector is closely related to management approaches for *P. oceanica* in touristic coastal areas. The use of impressive photos and infographics combined with the compact presentation of elaborate concepts can be engaging for diverse audiences.
- At the IBCF Rome edition, the thematic panels covering all sectors of the bioeconomy provided first knowledge about bio-based products and circular bioeconomy. The information presented in the Gallery helped teachers and students to understand the discussion held during the satellite event's conference.

Very flexible and suitable for both larger and smaller events. The Gallery works well at larger events, as explained above, where they can serve as an indicator of actual attendees' engagement, who usually start discussions with other participants and the organisers. The Gallery can also be used for smaller and more structured activities, such as during classroom workshops.

When working with younger participants in activities, it is recommended to only with the images, rather than with full roll-up banners. The content of latter is harder to understand for lower age categories. It is advisable to create simpler posters for these groups.

The BioArt Gallery format is more effective when paired with other formats (e.g., T2.1a – Hands-on experiments and T2.1b - Bioeconomy Village) by providing further information and concrete examples to participants.

## 3.5 Participatory photography to narrate, investigate the circular bioeconomy, and activate our gaze on everyday sustainability (APRE)

### 3.5.1 Concept of the format/activity and prior experience

APRE is developing a new format named "***art and expressive means to convey science-related contents to youngsters and bring citizens closer to science"*** in which different types of educational activities will be gathered, using arts and expressive means to convey bioeconomy concepts to young people.

This activity foresees the use of participatory photographs and videos to involve students and their parents with the aim to reflect and raise awareness about bioeconomy applications in daily contexts. This format is developed as an educational factsheet and will be included in the GenB toolkits (see D.1.3 for details on the content).

Participatory photography can be used to engage youth and families on the opportunities of circular bioeconomy in their everyday context. The bioeconomy covers both traditional, artisanal products that sometimes have been around for centuries as well as innovative products that are made using the latest biotechnology. Through photographs (and/or video recordings), young people become aware of the numerous and concrete applications of the bioeconomy, collecting virtuous examples existing in their everyday contexts, and stimulating sustainable choices through a critical and conscious gaze. In addition, through this format, young people (primary education classes) take photographs together with their families, who are actively involved as key players in lifelong learning. Older children (middle and high school students) can take photographs and videos by themselves.

### 3.5.2 Activities implemented in GenB to date

In the Living Lab that APRE organized in 2023 this format was used in the primary class of I.C Guicciardini Roma as a homework activity suggested to the teacher to deepen the bioeconomy concepts learnt in the classrooms.


*Figure 14 - Photos taken by 4th graders of IC Guicciardini Elementary School, Rome (2023.*

This is an additional format that was not foreseen/pre-identified in the project proposal or the GA. There is no KPI that must be met. It was piloted by APRE. Further implementation of the format will be decided "on the way".

### 3.5.3 Main lessons learned

The children and teachers really enjoyed the format as they had fun discovering natural bioeconomy products in their own neighbourhood. It is a simple, creative, and participatory homework activity that teachers can give to their students to consolidate the knowledge and express their perspective, but also a way to involve their parents in the activity. The format can be easily replicated and used with different age groups, from very young kids to young adults.

# Inspire and inform students in bioeconomy careers

Task 2.2 "*Inspire and inform students in bioeconomy careers*" will experiment activities to attract new generations on bioeconomy related career through the following formats and activities:

- Task 2.2a: Role-playing game on bioeconomy jobs in schools
- Task 2.2b: TEDx pitches
- Task 2.2c: Bioeconomy careers info days
- Task 2.2d: A Day in a biorefinery study visit
- Task 2.2e: Schools' projects to grow future entrepreneurs

Table 16 presents an overview of the Task 2.2 formats/activities to inspire and inform students in bioeconomy careers, the countries where activities will be implemented, and the associated Key Performance Indicators (KPIs).

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| #3 Role-playing game on bioeconomy jobs in schools |  | Game to become more familiar with different professions in the bioeconomy (circular farmers, biotech researchers, etc.) | #150 students | Spain Greece Pan-European |
| #3 TEDx pitches |  | Storytelling on bioeconomy applications, risks, and benefits, involving GenB ambassadors as testimonials | #240 students | Italy Slovakia Pan-European |
| #4 Bioeconomy careers info days |  | Involving researchers and professionals as testimonials | #300 students | Greece, Italy Slovakia Pan-European |
| #3 A Day in a biorefinery study visit |  | Open door days in biorefineries and research labs | #100 students | Italy Netherlands Pan-European |
| #1 schools' project to grow future entrepreneurs |  | To grow future bioeconomy entrepreneurs (e.g. Startupper School Academy) in Italy | #5000 students | Italy |

*Table 16 -WP2 formats to inspire and inform students in bioeconomy careers*

## 3.6 Role-playing game on bioeconomy jobs in schools (T2.2a)

### 3.6.1 Concept of the format/activity and prior experience

The role-play game on bioeconomy jobs will be a fun and educational activity that can be adapted for pre- and early-school children (4-8 years old) to introduce them to the concept of bioeconomy and the various jobs associated with it. It is called BioHeroes: let's save the planet!

And it is a print to play card game. The basic idea of the game is to allow children to role-play as different bioeconomy professionals and learn about their roles and responsibilities. For example, the game could involve children playing the roles of farmers, biologists, chemists, engineers, or entrepreneurs, all of whom play an important role in the bioeconomy.

### 3.6.2 Activities implemented in GenB to date

Three (3) GenB partners (HSPN from Greece, AIJU from Spain and EUN from Belgium/Pan European) are charged to implement the role-play game. The duration of the role-play game will be up to 2 hours. Target groups in Greece and Spain are early and pre-primary school students from 4 to 8 years old. In the case of EUN, (international primary, secondary and teacher) teachers are the target group.

EUN implemented a first role-playing game (RPG) on 19-20 March 2024 in **Brussels** as part of its teacher training programme "Future Classroom Lab workshop: Supporting STEM Educators: Innovative Approaches to Teaching and Learning". 23 international primary, secondary and teacher trainers, and a headmaster, participated in a 1.5h training workshop that was split into two parts. The first workshop part focused on introducing teachers to the basic terms and concepts of bioeconomy, available teaching resources and careers in the field, as part of Task 2.3a: Educational activity using the toolkits. The second workshop part was dedicated to the implementation of the RPG. Amont the 23 participants were 3 teachers teaching students between the ages of 5 to 11, a target group relevant to this format.

As a stream in the Scientix-Bioeconomy Award within the 2024 STEM Discovery Campaign (1 Feb. – 30 April 2024), EUN provided teachers with guidelines and materials how to implement the RPG with their students. The materials provided included different career-related materials developed within GenB (i.e. the RPG developed by AIJU, and the Bioeconomy Career Factsheets developed by EUN). Participants were instructed on how to implement the format and report on it by providing a story of implementation. The activity is in progress.
Still under consideration is the implementation of another RPG activity in the context of the 41st Science Project Workshops, which will be held on 4-5 July 2024 in the FCL in Brussels.

In **Spain**, AIJU implemented the role play card game on professional profiles in the bioeconomy. AIJU proposed its development of its "print to play" card game on bioeconomy professions in its ToyLab Experience, with a total of 50 students in the second year of primary school, aged 8-9 years old (29 Pre- and early-school students from 4-8 y.o. and 21 Elementary school students from 9-13 y.o.). The workshops took place on 22 and 25 March 2024 and lasted two hours. Prior to the game, a participatory assembly was held in small groups to reflect on the professions related to the bioeconomy and their tasks. This was followed by at least two game sessions in each of the groups, which consisted of 4 participants (Figure 14).

*Figure: 14. Children playing RPG BioHeroes: let's save the planet!*

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| Role-playing game on bioeconomy jobs | | Game to become more familiar with different professions in the bioeconomy | #150 students | Greece<br>Spain<br>Pan-European |

*Table 17 - WP2 format 2.2a: Role-playing game on bioeconomy jobs in schools - key characteristics*

Table 18 -WP2 format 2.2a: Role-playing game on bioeconomy jobs in schools - planned and implemented gives a short overview of the role-playing games planned by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| HSPN | Greece | Athens | May-Oct '24 | Within HSPN Educational programmes | Pl |
| AIJU | Spain | Valencia | March '24 | At AIJU ToyLab Experience | I |
| EUN | Pan-European | Various | Feb-Apr '24 | FCL | I |
| | | Brussels | July '24 | Scientix and Life Terra project | Pl |
| | | Various | Feb-Apr '24 | 2024 SDC | Ip |

*Table 18 -WP2 format 2.2a: Role-playing game on bioeconomy jobs in schools - planned and implemented*

*Status: Ip = In progress; I= Implemented; IP = In Progress; Pl = Planned*

| Parameter | Value |
|---|---|

| | |
|---|---|
| Target countries | 3 |
| Countries with implementation (largely) completed | 2 |
| Countries with ongoing or planned implementation | 2 |
| Events implemented | 2 |
| Participants engaged | 73, including 3 teachers who teach children 4-8 y.o. |
| Targets to be engaged | 150 students |

*Table 19 - impact against KPI in each country.*

From the above two tables (on Activities and on Impact) it can be seen that **the implementation of this task is well on track**. No problems are anticipated reaching the KPI in time (by 28 February 2025 the latest).

### 3.6.3 Main lessons learned

Based on the Spanish experience, activities under the principle of "Learning by playing" represent a highly effective educational methodology, which emphasizes active participation, practical experimentation and experiential learning. Valuing play as a fundamental tool for learning, these games not only transmit knowledge and skills, but also encourage creativity and problem solving. By promoting a deeper, lasting understanding of the concepts taught, these dynamic and stimulating learning experiences empower children to understand the importance of the bioeconomy.

On the other hand additional guidance and clarification of the rules need to make this format is very appealing for the age group between 4-9 years, as demonstrated by the Pan-European experience. Indeed the participants indicated that the game would be visually appealing and would keep the attention of students with additional information. Moreover, they suggested that the role-playing game could be performed in pairs which would foster collaboration and peer-to-peer learning.

## 3.7 TEDx pitches (T2.2b)

### 3.7.1 Concept of the format/activity and prior experience

**Concept:** The goal of TEDx is to inspire a passion for spreading ideas in local communities from within. TEDx pitches represent storytelling formats used to inform and inspire students and other multipliers on bioeconomy applications, risks, and benefits. TEDx talks are a showcase for speakers presenting well-formed ideas in under 18 minutes. This format was proven to be an effective education format because it is based on the direct connection among peers (students). In particular, very young students are keener on learning from other students because they are perceived as inspirational examples, who are close to their age, experiences and who share the same values.

In GenB TEDx-style pitches will be delivered by students to talk about the bioeconomy and bio-based products. This format represents an effective way to directly involve the different categories of GenB ambassadors (i.e. Young Biovoices, Activists, and Frontrunners; see D3.1) by engaging young people. Candidates for giving TEDx pitches will be selected from among the GenB Ambassadors community and will be empowered through a series of capacity building webinars in T3.2 to help them in their activities to promote and communicate the circular sustainable bioeconomy. Additionally, a toolkit targeting GenB Ambassadors will be made available in close collaboration with T1.4 to further support them.

**Inspirational previous experience:** The TEDx pitches format was first implemented in the context of Transition2BIO, during the awarding event of the Startupper School Academy school competition. In this event, students were involved, trained, mentored, and supported in delivering a bioeconomy pitch. The format proved to be effective in this and in further experiences because it is based on the direct connection among peers (students). In particular, very young students are keener on learning from other students because they are perceived as inspirational examples, who are close to their age, experiences and who share the same values. A secondary indirect target of this format are the families because students are the perfect multipliers of sustainability contents, greatly contributing to promoting behavioural and attitudinal changes.

### 3.7.2 Activities implemented in GenB to date

Three (3) GenB partners (FVA and APRE from Italy, PEDAL from Slovakia, and EUN from Belgium/Pan-European) are charged to implement the TEDx pitches. Target groups in Italy and Slovakia are young people, aged 15 to 35, including early career scientists, young entrepreneurs, and start-uppers as well as their families, teachers, and multipliers (and citizens in general). In the case of Italy, building on the experience gained in the Startupper School Academy, the TEDX pitches would be delivered primarily by students. In the case of EUN, the organisation's beneficiaries and target group are international teachers and educators, working in formal education.

To date, the TEDx pitches format was piloted in the context of the 2023 European Researchers' Night (ERN) event held in Frascati, Italy, and replicated in the context of national satellite events organized in Italy and Slovakia in March 2024 in the context of the EC Bioeconomy Changemakers Festival (BCF). In both events, the "Students2Students" format was applied, which aims at promoting the participation of students as testimonials in GenB contents and activities (see GenB Deliverable D3.1 for details).

The format, after the kick-off in Italy and the first replications in Italy and Slovakia, is now ready to be replicated in other GenB Countries. For example, it is planned to be implemented in the context of the Future Classroom Lab (FCL) to be held in Brussels in July 2024. A GenB Ambassador from the Netherlands has been invited to the FCL to give a TEDx pitch about bioeconomy education to international teachers.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| TEDx pitches | | Storytelling on BE applications, risks, and benefits, involving GenB ambassadors as testimonials | #240 students | Italy<br>Slovakia<br>Pan-European |

*Table 20 - WP2 format 2.2b: TEDx pitches - key characteristics*

**In Italy**, FVA, working with APRE, piloted the activity in the European Researchers' Night held in Frascati on 29-30 September 2023, involving young GenB Ambassadors from 9 to 19 years old. Specifically, the younger children read a tale on the adventurous apple Melania (connecting topics like the importance of valorising residues to produce bio-based products e.g. vegan leather from apple skin), while the oldest children explained the public about the bioeconomy, delivering a speech with practical examples of bio-based products that were showcased by the younger children (see pictures below). The TEDx was recorded and shared on @BIOVOICES YouTube channel (link here).


*Figure 15 - GenB Ambassadors performing the TEDx at European Researchers' Night 2023*

After kicking-off the format, FVA replicated the activity with 19 y.o. Italian GenB Ambassadors, in the context of the Italian Bioeconomy Changemakers Festival – Rome edition on 14 March 2024. In this context, the pitch format was fine-tuned and tailored to be more informative also towards the bioeconomy contribution in addressing the main environmental challenges, as well as to promote new studies and working careers in the domain (see picture below).


*Figure 16 - GenB Ambassadors performing the TEDx at Italian Bioeconomy Changemaker Festival -Rome edition*

In **Slovakia**, the TEDx format was likewise implemented in the context of the Bioeconomy Changemakers Festival – Nitra edition, held on 13 March 2024. As part of their TEDx pitches, five (5) young professionals presented various career opportunities in the bioeconomy, with the aim to inform about the variety of careers in the field and to inspire and attract young people to explore and study bioeconomy. Their talks were recorded for future use as testimonials.

Table 21 -WP2 format 2.2b: TEDx pitches – piloted and planned activities. gives a short overview of the TEDx pitches piloted and planned by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| FVA APRE | Italy | Frascati | Sep '23 | ERN | Pt |
| | | Rome | 14 Mar '24 | Satellite event Bioeconomy Changemakers Festival | I |
| PEDAL | Slovakia | Nitra | 13 Mar '24 | Satellite event Bioeconomy Changemakers Festival with GenB Ambassadors | I |
| EUN | Pan-European | Brussels | 5-6 July '24 | Scientix and Life Terra project-SPW: Face-to-face event with GenB Ambassador from NL | Pl |

*Table 21 -WP2 format 2.2b: TEDx pitches – piloted and planned activities.*: Status: Pt = Piloted; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 3 |
| Countries with implementation (largely) completed | 2 |
| Countries with ongoing or planned implementation | 1 |
| Events implemented | 3 |
| Participants engaged | At least 130 participants (including 110 students in IT and 20 in SK) |
| Targets to be engaged | 300 students |

*Table 22 -WP2 format 2.2b: TEDx pitches – - impact against KPI*

From the above two tables (on Activities and on Impact) it can be seen that **the implementation of this task is well on track**. No problems are anticipated reaching the KPI in time (by 28 February 2025 the latest).

### 3.7.3 Main lessons learned

For an effective TEDx pitch, a well-structured presentation is needed: begin by engaging the audience with a relatable example, followed by a clear explanation of the idea, supported by evidence and implementation strategies. The conclusion should highlight the potential impact of the topics on the audience. It's advisable to provide support to GenB Ambassadors in refining their TEDx pitches and organise a rehearsal, ensuring they feel confident and supported in conveying complex concepts related to the bioeconomy. This format can be effectively implemented in large-scale events, including those organized by the European Commission and involving younger generations on stage.

Trying-out the format in a pilot provided valuable insights on how to finetune the TEDx-format to make it even more informative.

Combining the TEDx pitch format with the reading of a fairy tale (as was done during the EU Researchers' Night in Frascati, Italy) appeared very effective to engage a mixed audience composed of families with kids and teenagers.

The on-stage presence of the GenB Ambassadors of different ages attracted the attention of the public and especially of their peers (e.g. in the Bioeconomy Changemakers Festival in Italy and Slovakia), representing an innovative approach to transfer these contents compared to having "experts" on stage.

## 3.8 Bioeconomy careers info days (T2.2c)

### 3.8.1 Concept of the format/activity and prior experience

In general, a career day is an activity in which business partners from a variety of companies and other organisations come together to share information about their workplace, their job, and

the education and skills that are required for success in their career. The career days can take place at a school, or it can be organised as dedicated event.

The aim of the GenB bioeconomy career info day is to provide a platform for students and recent graduates and employers to meet each other. The event is an ideal opportunity for students to network and an excellent chance to meet a future employer.

The career info day can target high school students that are about to choose the topic of their study at an academic university, an applied university, or other type of tertiary education. Alternatively, the career info day can target students that are about to graduate and to enter the professional labour market. Irrespective of the age group targeted, the idea is that experts working in the bioeconomy field explain different career paths inspiring young people.

### 3.8.2 Activities implemented in GenB to date

Four (4) GenB partners (Q-PLAN from Greece, APRE from Italy, PEDAL from Slovakia and EUN from Belgium/Pan European) are charged to implement bioeconomy career info days. Based on a successful try-out by APRE in November 2023 in the context of Ecomondo, Q-PLAN, APRE, and PEDAL implemented this activity as part of a local satellite event of the 2024 EC Bioeconomy Changemakers Festival. EUN implemented the activity online, in the form of career chat.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| Bioeconomy careers info days | | Involving researchers and professionals as testimonials | #300 students | Greece, Italy Slovakia Pan-European |

*Table 23 -WP2 format 2.2c: Bioeconomy careers info days - key characteristics*

In **Italy**, APRE, with the support of FVA, implemented a first bioeconomy career info day in Italy in the context of Ecomondo – the Green Technology Expo – in November 2023. During this event, APRE organised a cross-disciplinary and cross-society debate, deepening a policy-oriented vision of the competences to be developed. Moreover, in Italy, Cluster Spring applied the "Career Talks" format during the Bioeconomy Changemakers Festival (February 2024). Young entrepreneurs and workers in bioeconomy shared their successful stories with students, to inspire and attract them towards green careers. During their pitches, the speakers covered different domains in which the bioeconomy can represent an opportunity for studying and working careers (see pictures below).

The bioeconomy careers info day format was replicated in local editions in Italy (Rome), Greece (Thessaloniki), and Slovakia (Nitra) of the March 2024 EC Bioeconomy Changemakers Festival, as sketched below.

*Figure 17 - Career Talks during the Italian Bioeconomy Changemaker Festival -Rome edition*

In **Greece**, Q-PLAN implemented a bioeconomy career info day focused on young adult professionals and university students (focus on 18-19 y.o). The info day entailed an introduction on the status quo of the Greek Bioeconomy ecosystem, followed by presentation of educational programmes by higher education institutions and storytelling by successful bioeconomy professionals representing diverse career pathways, in agriculture, industry, communication & marketing, urban innovation and a start-up. Young students were informed about entrepreneurship programmes to convert their vision to business ideas, e.g. a university incubator and had the chance to exchange views with the Region of Central Macedonia on policy measures to promote bioeconomy skills and competencies. The BioArt Gallery (see 3.4) and job profiles developed in the parallel EC-funded BioGov.Net project were exhibited at the venue. Four (4) Greek GenB Ambassadors from Thessaloniki attended the event.


*Figure 18 - Career info day organisation in Greece*

In **Slovakia,** the career info day was combined with the TEDx speeches during the Bioeconomy Changemakers Festival, Nitra edition. Five (5) young professionals presented their present careers in the bioeconomy, as well as their educational path, leading to the career. As the event took place in a research centre focusing mainly on the field of agriculture and food, the participants had the opportunity to also take part in a workshop presenting opportunities for innovations and business, where the young participants had the opportunity to meet researchers, entrepreneurs, and policy makers.

EUN, whose beneficiaries and target group are international teachers and educators, implemented a 1-hour online career chat on 9 April 2024 as part of the 2024 **STEM Discovery Campaign**. The chat was held with a Dutch expert working on sustainable building and transition of Dutch construction sector towards a sustainable and circular economy. Secondary school teachers as well as their classes had a chance to meet the industry expert and learn about career opportunities, skills, knowledge, and personal traits needed to become an expert in bioeconomy in the construction sector.

Table 24 -WP2 format 2.2c: Bioeconomy careers info days - planned and implemented activities. gives a short overview of the career info days organised and planned by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| Q-PLAN | Greece | Thessaloniki | 14 Mar '24 | Satellite event Bioeconomy Changemakers Festival collaborating with BioGov | I |

| | | | | | |
|---|---|---|---|---|---|
| APRE & FVA | Italy | Rimini | 10 Nov '23 | ECOMONDO | I |
| | | Rome | 14 Mar '24 | Satellite event Bioeconomy Changemakers Festival | I |
| | | Rome | 24 May '24 | Bioeconomy skills and careers | PI |
| PEDAL | Slovakia | Nitra | 13 Mar '24 | Satellite event Bioeconomy Changemakers Festival with GenB Ambassadors | I |
| EUN | Pan-European | Online | 9 April '24 | 2024 SDC in collaboration with Dutch construction sector expert | I |

*Table 24 -WP2 format 2.2c: Bioeconomy careers info days - planned and implemented activities.*: Status: Ip = In progress; I= Implemented; PI = Planned*

Commentato [FF2]: ??? È l'evento di Fava?

Commentato [LM3R2]: Si.

| Parameter | Value |
|---|---|
| Target countries | 4 |
| Countries with implementation (largely) completed | 4 |
| Countries with ongoing or planned implementation | 1 |
| Events implemented | 5 |
| Participants engaged | 234 including 55+ persons in GR (including students, bioeconomy actors, teachers, researchers, NGOs, policymakers), 120 students, teachers, and tutors in IT, 30 students in SK, 4 teachers and 24 high school students directly in EU |
| Targets to be engaged | 300 students |

*Table 25 -WP2 format 2.2c: Bioeconomy careers info days - impact against KPI*

From the above two tables (on Activities and on Impact) it can be seen that **the implementation of this task is fully completed**. The overall KPI has been achieved successfully.

### 3.8.3 Main lessons learned

The career info day is a learning opportunity not only for students, but also for seasoned professionals who learn how to invite young and future professionals to join through imaginative and practical ways. This is a key element, as a tendency towards introversion is observed within the Greek bioeconomy community (as a niche sector) – evident by the fact that ecosystem actors know each other very well but awareness on the sector is still low among students.

The participation of **young speakers** was more attractive for the audience who empathised more easily with the speakers. Moreover, the speakers used a simple language enriched by practical examples that support the students to become familiar with the different sectors of the green

jobs. To keep the attention of the audience, it is good to choose a smaller number (4-5) of speakers, but with different careers/topics.

Younger students were less attentive in some speakers' pitches. Targeting individuals who must choose their study or work pathway (such as students in the final years of high school, young adults, and early-stage professionals) is more meaningful. There is a higher probability for them to make career choices in sustainable fields in general, and bioeconomy in particular, based on the information received. For instance, a student with political science background requested information to join the Greek Bioeconomy Council which is currently under formation.

Students need concrete and practical information on bioeconomy career pathways and infrastructure in the region for education and skills–building. Students find it hard to navigate opportunities on their own. Information on the connection of undergraduate studies with bioeconomy is very limited.

Storytelling (career testimonials) and speaker diversity is essential for inspiration and resolving misconceptions, conveying the message that bioeconomy is a broad, interdisciplinary field accessible to anybody and not only professionals in biology, biotechnology, and STEM in general.

The recording of the speaker pitches helps to ensure that the stories can be used further and in other formats.

## 3.9 A Day in a biorefinery study visit (T2.2d)

### 3.9.1 Concept of the format/activity and prior experience

**Concept:** Biorefining is the sustainable processing of biomass into a spectrum of bio-based products and bioenergy. This format aims to inform and attract talent in life science, technology, and bioeconomy opportunities. It involves the organisation of a site visit for a group of students (aged 11 years or older) and their teachers to a commercially operating biorefinery (or other relevant and interesting bioeconomy plant) with its own research facilities, to experience a day as researcher or other professional in the bioeconomy. Elements of a "Day in a Biorefinery" may include: a site tour of the production and the research facilities, an on-site informative workshop, addressing e.g. career opportunities or including a testimonial of a professional working at the biorefinery, and an Information market (to display product samples, information materials, etc.). During the site visit an expert explains the bioprocess and technology of the plant, the activities carried out, and the expertise needed to work in the biorefinery.

**Inspirational previous experience:** Many industrial plants in the bioeconomy can be visited by the public. Visiting opportunities may be provided almost daily, once a week or month, or only on special occasions. Beer breweries, winemakers and other food processing plants are examples in the first category. Chemical plants that can be visited only during dedicated events (e.g. Open Door days) fit in the last category. Because of safety issues, visiting industrial plants with younger people (e.gl. school classes) can be problematic.

### 3.9.2 Activities implemented in GenB to date

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| #3 "A Day in a biorefinery" study visit | | Open door days in biorefineries and research labs | #100 students | Italy Netherlands Pan-European |

*Table 26 -WP2 format 2.2d: "A Day in a biorefinery" study visit- key characteristics*

Three GenB partners (APRE from Italy, BTG from Netherlands and EUN from Belgium/Pan-European) are charged to implement biorefinery study visits. APRE and BTG will organise this as a physical event. EUN planned to perform this activity online as 1-hr career chat with an expert sharing her/his experience in the bioeconomy field.

BTG and APRE searched, identified, contacted, and engaged several chemical plants that produce bio-based products as potential host for a study visit. Unfortunately, almost all pre-identified, relevant industries are located at long distances of the Partners' headquarters. After consulting with the coordinator APRE, it was decided to re-adjust the study visit focus from "biorefinery" to "other relevant and interesting bioeconomy plant". In March 2024, agreement was reached between BTG and Bonhoeffer College (**Enschede/NL**) that young students from up to three Technasium classes would visit the BTG Group laboratories and biomass conversion plant (Enschede/NL). Located at walking distance, the logistics travelling from the school to the bioeconomy plant, and vice versa, can be easily organised and at low cost.

In **Italy**, APRE has extended the target group to the elementary school. The visit is organised in an educational Farm "Fattoria Didattica Cupidi" (2nd May 2023) that has heating plant supplied by biomass. Two classes of elementary school will participate in learning and educational activities on the topic of energy from renewable sources, the company's reforestation, on organic manure as an essential resource, and through the observation of the wood chip supply chain from production to use in the boiler for thermal energy. One of the two classes involved has been previously trained by researchers within the Horizon Europe SLEs project, of which APRE is partner, on the circular economy, bioeconomy and environmental sustainability through open schooling and STEAM approaches.

When it comes to EUN, considering the beneficiaries and the target group of the organisation activities, i.e. international teachers and educators, EUN is unable to provide equal opportunity for them and organise a physical study. The initial plan of EUN included organising a 1-hour career chat with an expert working in a biorefinery in Ghent, Belgium, however the representative of the plant was not interested in such opportunity. After consultation with the project coordinator APRE, EUN agreed to conduct 2 1-hour webinar sessions on the topic of biorefineries and include the webinar recordings as learning materials in the MOOC that will be developed within the project.

Table 27 -WP2 format 2.2d: "A Day in a biorefinery" study visit" - planned and implemented activities. gives a short overview of the biorefinery site visits implemented and planned.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| APRE | Italy | Viterbo | 02 May 2024 | "Fattoria didattica Cupidi" | PI |
| BTG | Netherlands | Enschede | May '24 | Adviseurs v/d Toekomst at Bonhoeffer College | PI |
| EUN | Pan-European | Online | '24 | Stand-alone event in collaboration with Scientix | PI |

*Table 27 -WP2 format 2.2d: "A Day in a biorefinery" study visit" - planned and implemented activities.*: Status: PI = Planned*

| Parameter | Value |
|---|---|
| Target countries | 3 |
| Countries with implementation (largely) completed | 1 |
| Countries with ongoing or planned implementation | 3 |
| Events implemented | 1 |
| Participants engaged | 45 students and 5 teachers in Italy |
| Targets to be engaged | 100 students |

*Table 28 - WP2 format 2.2d: "A Day in a biorefinery" study visit" - impact against KPI.*

From the above two tables (on Activities and on Impact) it can be seen that **implementation of this task is at the planning stage**. Only in Italy the first targets have been reached. Provided the format is reshaped a bit -as discussed above- no problems are anticipated reaching the KPI in time (by 28 February 2025 the latest).

### 3.9.3 Main lessons learned

Not applicable yet

## 3.10 Schools' project to grow future bioeconomy entrepreneurs (T2.2e)

### 3.10.1 Concept of the format/activity and prior experience

**Concept:** School projects are a specific type of activity that allows consolidating knowledge about the bioeconomy, enabling students to check and/or demonstrate the acquired knowledge, deepening it or even promoting creativity or innovation. The aim of the format is to grow future bioeconomy entrepreneurs.

**Inspirational previous experience:** Two school competitions withing the scope of this activity were organised in Italy before the start of GenB. The first, Bioeconomy4YOU, had an exclusive focus on circular bioeconomy. The second, Startupper School Academy, has a broader focus on innovation and has been thematically enriched with the topic circular bioeconomy since 2018.

- The **Bioeconomy4YOU** school competition was organised in 2022 in Italy by FVA and APRE together with Re Soil Foundation, Cluster SPRING, Raul Gardini Foundation and Novamont with the aim to raise awareness, inform and educate young generations on the bioeconomy, while collecting and awarding the most creative ideas on how they imagine their future in the circular bioeconomy.
- The **Startupper School Academy** is a school competition recognized by the Italian Ministry of Education, organized for several years by Lazio Innova, the Lazio Region organisation responsible for boosting innovation in the region. Since 2018 the Startupper School Academy is enriched by the thematic award dedicated to the circular bioeconomy, thanks to the collaboration with the EU-funded projects BIOVOICES (from 2018 to 2020), Transition2BIO (from Jan 2021 to Dec 2022) and GenB (from 2023). The objective of the bioeconomy prize of the Startupper School Academy is to: promote awareness and education about bioeconomy, its sectors, impacts and benefits to drive the transition towards more sustainable behaviour of young people; inform on opportunities and inspire study and work careers in the domain.

### 3.10.2 Activities implemented in GenB to date

GenB implements "Schools' projects" to grow future bioeconomy entrepreneurs in a single country, targeting primary schools, elementary school students (9-13 y.o.) and high school students (14-19 y.o.). FVA, working in collaboration with APRE, is charged to implement the format in Italy. FVA will do so by participating (again) in the 2023-2024 edition of the Startupper School Academy, which focuses on sustainable living and how the bioeconomy can be integrated in built environments.

The Startupper School Academy is a school competition recognized by the Italian Ministry of Education. Small teams of high school students present a business idea for a product or service dealing with the bioeconomy or with bio-based products. Students receive different types of mentoring and training, to transform their initial idea into a concrete business plan, to be pitched to a jury.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| Schools project to grow future entrepreneurs |  | To grow future bioeconomy entrepreneurs (e.g. Startupper School Academy) in Italy | #5000 students | Italy |

*Table 29 -WP2 format 2.2e: schools' projects to grow future entrepreneurs - key characteristics.*

Targets of the format are predominantly high school students (14-19 years old) and their teachers and tutors. As part of the programme, 3 online capacity building webinars were

delivered between November 2023 and February 2024. Specifically, the training session focused on:

- The circular bioeconomy and sustainable living, including how the bioeconomy contributes to environmental challenges and controversial topics
- Biomaterials and bio-based products for a sustainable living, including hands-on labs to create do-it-yourself biomaterials and prototypes
- Design thinking session on how to develop an idea.

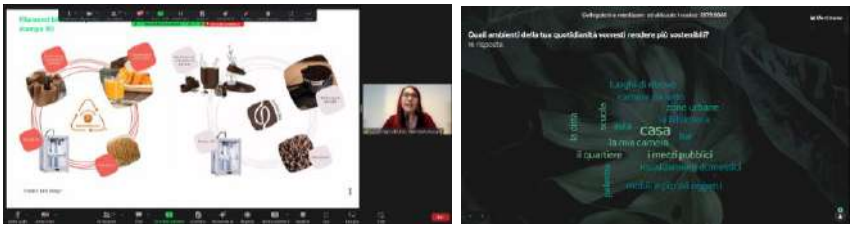


*Figure 19 - schools' projects to grow future entrepreneurs- online activities*

Table 30 - WP2 format 2.2e: schools' projects to grow future entrepreneurs - planned and implemented activities. gives a short overview of the schools' project to grow future bioeconomy entrepreneurs planned by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| FVA (& APRE) | Italy | Online | Nov '23 – Feb '24 | Startupper School Academy with Lazio Innova and ENEA | I |

*Table 30 - WP2 format 2.2e: schools' projects to grow future entrepreneurs - planned and implemented activities.*: Status: Pt = Piloted; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 1 |
| Countries with implementation (largely) completed | 1 |
| Countries with ongoing or planned implementation | 0 |
| Events implemented | 3 |
| Participants engaged | ~6000 reached, directly involved 380 students, teachers, and tutors |
| Targets to be engaged | 5000 students |

*Table 31 -WP2 format 2.2e: "schools' projects to grow future entrepreneurs" - impact against KPI.*

From the above two tables (on Activities and on Impact) it can be seen that **the implementation of this task is fully completed**. The overall KPI has been achieved successfully.

### 3.10.3 Main lessons learned

Leveraging existing, well-established initiatives like the Startupper School Academy and Bioeconomy4YOU for school projects offers numerous advantages. These initiatives yield higher impact compared to standalone projects, since they benefit from greater promotional resources and organizational support, and reach a wider visibility through partners' communication channels, including media coverage. For instance, Bioeconomy4YOU successfully engaged young generations during Italy's Bioeconomy Day in 2022, showcasing their contributions on a national stage. Similarly, the Startupper School Academy facilitated indirect engagement with regional authorities and policymakers, generating interest in the bioeconomy. Additionally, collaboration with external partners enriches programme content and prize offerings. The capacity building package developed to support students and teachers can be used in other tasks or activities (e.g. T2.3, T2.4, T2.5, see the next chapters). Additionally, the tutors responsible to follow the students in their day-by-day implementation of the programme should be empowered in order to ensure a valuable outcome for the school project.

# 4 Educate young people to promote the biotransition

Task 2.3 promotes sustainable and circular behaviours and lifestyles through the delivery of dedicated educational activities using the toolkits developed in WP1. The following formats will be developed/provided within this Task:

- Task 2.3a: Educational activity using the toolkits
- Task 2.3b: Bioeconomy talks/ seminars inquiry-based learning
- Task 2.3c: Online bio educational village

Table 32 presents an overview of the Task 2.3 formats/activities to educate young people to promote the biotransition, the countries where activities will be implemented, and the associated Key Performance Indicators (KPIs).

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| #24 Educational activities using the toolkits |  | Book for kids, videos, games, quizzes, and exercises | #720 young people | AT, IT, SK, ES, EL, BE, PT, NL |
| #8 Bioeconomy talks/seminars inquiry-based learning |  | Inquiry based learning to stimulate students' reflection and debate | #400 young people | AT, IT, SK, ES, EL, BE, PT, NL |
| #1 online bio educational village |  | Self-guided or facilitated online education activities (such as Geco For School, Gather town) | #5000 young people | EU-wide |

*Table 32 - WP2 formats to educate young people to promote the biotransition*

Beyond the above formats, that are all foreseen in the GenB GA, a new format was developed, *storytelling for kids*, which aims to raise environmental awareness in children, using different tools (including fairy tales, stories, poetry, riddles, podcasts). The tools were piloted at different schools and events in Italy (Rome and Frascati, conducted by APRE and FVA) and Greece (conducted by HSPN). In Italy, several young GenB Ambassadors were involved in the pilot implementation. Partner experience with developing and piloting the format is described at the end of this chapter.

## 4.1 Educational activities using the toolkits (T2.3a)

### 4.1.1 Concept of the format/activity and prior experience

In T1.4 of WP1 "Co-creation of innovative approaches" a set of GenB educational toolkits will be developed for use in the activities of WP2 and WP3. In total 6 toolkits will be prepared, as follows:

1. Toolkit for young children (pre- and early-school, 4-8 years old)
2. Toolkit for elementary school students, 9-13 years old
3. Toolkit for high school students, 14-19 years old
4. Toolkit for teachers (formal education professionals targeting students of all ages)
5. Toolkit for other multipliers (including: (i) non-formal education professionals: youth organisations, community groups, museums, science communicators, amusement parks, journalists and media, NGOs); (ii) Experts groups; (iii) Communities of practices in education.
6. Toolkit for boosting the collaboration among teachers, parents and youth towards a more sustainable production, consumption, and lifestyles.

The toolkits will aggregate, and make available, suitable resources from previous EU-funded projects and produce new materials, including:

- Book for kids "What's Bioeconomy" (BIOVOICES) updated version with additional languages for pre- and early-school (4-8 years old)
- Game or gamified educational experience for Elementary school (9-13 years old)
- Bioeconomy quizzes and educational cards for social media and training for high schools (14-19 years old)
- Video teasers and educational videos, for the three target age groups
- Online factsheets "bioeconomy job profiles" for high schools (14-19 years old)
- Educational and information packages for the three target age groups
- Lesson plans, training contents, and MOOCs (Massive Open Online Courses)

In terms of content, the toolkit items can cover a range of topics related to biotransition. For example, the toolkit for young children (pre- and early-school, 4-8 years old), can cover topics and issues such as:

- What is biotransition? Introducing the concept of biotransition and explaining how it relates to our daily lives.
- Why is biotransition important? Exploring the importance of biotransition in areas such as sustainability, food security, and healthcare.
- How does biotransition work? Introducing the science behind biotransition, including genetics, biochemistry, and biotechnology.
- Who are the people involved in biotransition? Introducing the various careers associated with biotransition, such as scientists, engineers, farmers, and entrepreneurs.

### 4.1.2 Activities implemented in GenB to date

In Task 2.3a children and young people will be educated to promote the biotransition through the activities collected and created in the GenB Toolkits. All countries are involved in organising "*Educational activity using the toolkits*" in their respective countries.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| #24 Educational activities using the toolkits |  | Book for kids, videos, games, quizzes, and exercises | #720 young people | AT, IT, SK, ES, EL, BE, PT, NL |

*Table 33 - WP2 format 2.3a: Educational activities using the toolkits - key characteristics.*

**Toolkit content:** as described in detail in D1.3, GenB partners have developed and tested the following content for the toolbox:

- Additional translations, and updating, of the book for kids "What's Bioeconomy" (a BIOVOICES outcome)
- A board game to increase youngsters' awareness on the sustainable and circular bioeconomy Additional hands-on experiments for use in classroom activities with primary school students
- A new format using participatory photographs and additional hands-on experiments to involve students and their parents with the aim to reflect and raise awareness about bioeconomy applications in daily contexts
- A new format of Fairy Tales to stimulate the curiosity and elicit learning in very young kids
- A series of bioeconomy quizzes to engage and educate young people and their families/teachers
- Educational video and video teasers to understand the diverse products derived from biobased feedstocks, illustrating the concrete outcomes of bioeconomy
- An Escape Game "Escape4Future - Chemistry meets Bioeconomy". That integrates the inquiry-based learning and a gamified approach.
- A set of bioeconomy job profiles

The contents of the toolkits will be implemented depending on the context and audience. Targets include all three age groups of young people (1. Pre-school and early-school; 2. Elementary school, 3. High school) and their teachers. The duration of the face-to face activity will be typically in the order of 1-2 hours per group of students or classroom. The activities will be conducted either in collaboration with schools or in the context of events related to the bioeconomy (like festivals).

GenB partner EUN only works with teachers and educators and not directly with children. The partner organised various events targeting teachers and students indirectly, through their teachers. In 2023 2 workshops were conducted in their Future Classroom Lab in **Brussels,** attracting a total of 41 international teachers and educators. Firstly, a workshop within the context of the FCL teacher training programme *"Future Classroom Lab workshop: Innovative Practices for Engaging STEM Teaching*" on 24 April 2023. Secondly, a workshop during the 40th Science Project Workshop (SPW), held on 17 June 2023. Both workshops were intended for international primary and secondary school teachers aiming at introducing participants to the topic and inspiring them to reflect on different activities and materials that can be implemented in the context of their classrooms. In early 2024, two more workshops were organised. On 19

March 2024, a physical workshop "Exploring bioeconomy in the classroom: from theory to sustainability" was implemented within the framework of the FCL teacher training programme: *"Supporting STEM Educators: Innovative Approaches to Teaching and Learning*". The 1.5h workshop was intended for international primary, secondary and teacher trainers. The workshop was split into two parts, where the first part focused on introducing teachers to the basic terms and concepts of bioeconomy, available teaching resources and careers in the field. In the three-week period 28 Feb – 12 March 2024, an online workshop was organized_in collaboration with Scientix as part of the Science Project Online Workshop 17 (SPOW17): *'Sustainability in and outside of the classroom: from Bioeconomy to Nature-Based-Solutions'*, targeting international teachers and educators. SPOWs are interactive and practical workshops that include 2- 3 parallel tracks covering specific topics and age groups. GenB occupied the 2 tracks focusing on primary and secondary school teachers. The aim of the workshop was to introduce participants to the topic of bioeconomy and materials from the GenB Toolkit, and to engage participants collaborative reflection on available resources and activities to introduce bioeconomy in their lessons. Furthermore, the workshop participants were introduced to the different careers in the field, as well as the available materials regarding the introduction of careers in their lessons. A fifth, face-to-face workshop is to be implemented by EUN in the context of the 41st Science Project Workshops, on 4-5 July 2023 in the FCL in Brussels.

In **Austria** ZSI performed an educational activity explaining the concept of bioeconomy and using the contents of the Toolkit to children aged between 6 and 10 years at the primary school Volkschule Südstadt, Maria Enzersdorf. The main tool used was the "What's bioeconomy" book for kids. After going through selected chapters of the book, the pupils were given the task of thinking about things they use in their daily lives for example, or things they see around them that they think could be produced from bio-based materials and then they were asked to draw these. For those who could not think of any products that should be created from bio-based materials, they were asked to think about what they could do to impact the environment positively and then were asked to draw these.

*Figure 20 - Educational activity using the GenB Toolkit to children aged between 6 and 10 years*

In **Italy**, APRE implemented educational activities using the GenB toolkits in the context of classroom activities (living labs and inquiry-based learning) in primary and low-secondary classes of the I.C. Guicciardini school, Rome (March-June 2023) as well as in a focus group with experts to validate the Living Labs board game (September 2023). On these occasions, hands-on activities, the board game, the bioeconomy village, the Bio-Art gallery, and educational and information packages for different target groups were used. In addition, these toolkits were used in open air large-scale national events (e.g. "Sustainability day", May 2023; Afterschool final event, June 2023) to engage young people, their families and multipliers. Lesson plans and training contents were used with teachers (Jan 2024 and March 2023) and are planned to be used with multipliers (during 2024).

Also in Italy, FVA implemented a series of bioeconomy quizzes to engage and educate young people and their families/teachers in the context of several events and science festivals (EU Researchers' Night, Rome Maker Faire Fermhamente Science Festival, Bioeconomy Changemakers Festival – Rome Edition). Through a series of questions, these quizzes applied the inquiry-based learning and gamified approaches to stimulate students' reflection and foster debate. At the last three events FVA also implemented, in collaboration with high school students of ITT Montani (who participated in the GenB Living Lab, see WP1) the Escape Game "Escape4Future - Chemistry meets Bioeconomy". This game integrates the inquiry-based learning and a gamified approach. The players need to solve six interconnected enigmas that address green chemistry and bioeconomy issues through hands-on experiments or games. The last enigma will open a box with bio-based gadgets.

**Commentato [LM4]:** @Flavia Fusconi vogliamo aggiungere notte eu dei ricercatori, Marker Faire e Changemakers?

**Commentato [FF5R4]:** @Laura Mentini cosa vorresti aggiungere di preciso per il changamaker e il maker faire?

**Commentato [LM6R4]:** I contesti e le occasioni dove sono stati usati alcuni toolkits. Il bioeconomy village, experimenti hands-on, libro etc. Si può scrivere un paragrafo insieme a FVA

**Commentato [FF7R4]:** Ok, ho capito. Sì bisogna coinvolgere FVA

*Figure 21 - Escape4Future - Chemistry meets Bioeconomy at Bioeconomy Changemakers Festival – Rome Edition*

In Portugal, in the context of both the large-scale event Planetiers World Gathering and the Bioeconomy Changemakers Festival – Aveiro edition in March 2023 and March 2024 respectively, the book fir kids "What's bioeconomy?" has been presented in both English and Portuguese to the students, ranging from 7 to 18 years old, attending the events. Teachers accompanying their classrooms and families accompanying their children have also been briefed on what the book is about, how it was developed, what contents they may find (e.g., from flap windows explaining basic concepts of the bioeconomy to experiments to be done at home or at school). Additionally, during Planetiers World Gaterhing, a "Sustainability Quiz" broadcasted via a TV screen and using Drimify application was implemented by LOBA, targeting 15-18 years old students.

In Slovakia educational activities based on the toolkits were conducted in April-June 2023 within the living labs. These activities took place in schools, targeting the age of 6-9 and 12-13 y.o. kids. The materials and formats used included the hands-on labs, Bioeconomy Village, BioArt Gallery supported by methodologies like storytelling or design thinking.

*Figure 22 - Activities based on the toolkits within the living labs in Slovakia.*

Table 34 -WP2 format 2.3a: Educational activities using the toolkits - planned and implemented activities. gives a short overview of educational activities using the toolkits organised and planned by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| ZSI | Austria | Maria Enzerdorf | 9 May '23 | Classroom in collaboration with VS Südstadt | I |
| HSPN | Greece | Athens | Apr '24 – Feb '25 | HSPN educational programmes, Festivals and Open Events | PI |
| FVA | Italy | Fermo | Apr '23 | Living Lab with high school students at High school "ITT Montani" | I |
| | | Rome | Oct '23 | Maker Faire, Fermhamente | I |
| | | Lazio | Nov '23 – Feb '24 | Online webinars with Lazio Innova | I |

| | | | | | |
|---|---|---|---|---|---|
| | | Rome | Mar- Jun ‘23 | Living labs at Primary and Elementary I.C. Guicciardini school (Rome) | I |
| APRE | Italy | Rome Online | Mar ‘23 | Hands-on at primary and elementary IC Guicciardini school (Rome) | I |
| | | | Sep. ‘23 | Focus group with experts | I |
| | | | March 2023 and January 2024 | Teacher training | |
| APRE &FVA | Italy | Rome | Mar ‘24 | Bioeconomy Changemakers Festival | I |
| | | Rome | Sep ‘23 | EU Researchers’ Night with Frascati Scienza | I |
| | | Rome | Oct ‘23 | Maker Faire | I |
| | | T.b.d. | ‘24 | Classroom | Pl |
| BTG | Netherlands | Aveiro | Oct ’23 | Planetiers World Gathering | I |
| LOBA | Portugal | Aveiro | Mar ‘24 | Bioeconomy Changemakers Festival | I |
| | | Bratislava | SY ’24 – ‘25 | Classroom at different schools | Pl |
| PEDAL | Slovakia | Valencia | Apr ’24 – Feb ‘25 | AIJU ToyLab Experience | Pl |
| AIJU | Spain | Brussels | Apr & Jun ‘23 | Workshops FCL teacher training and Science Project Workshop (SPW) | I |
| EUN | Pan-European | Brussels & Online | Feb – Mar ‘24 | FCL teacher training and SPOW in collaboration with Scientix | I |
| | | Brussels | Jul ‘24 | Scientix and Life Terra project: SPW | Pl |
| | | | | | |

*Table 34 -WP2 format 2.3a: Educational activities using the toolkits - planned and implemented activities.*: Status: Pt = Piloted; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 8 |
| Countries with implementation (largely) completed | 4 |
| Countries with ongoing or planned implementation | 5 |
| Events implemented | 13 |

| | |
|---|---|
| Participants engaged | >600 (including 91 in AT, 377 in IT and 165 in ES) |
| Targets to be engaged | 720 Young people |

*Table 35 - WP2 format 2.3a: Educational activities using the toolkits - impact against KPI*

Commentato [JV8]: (based on 173 Pre- and early-school (4-8 y.o.), 130 Elementary school students (9-13 y.o.) and 74 Other e.g. Teachers)

From the above two tables (on Activities and on Impact) it can be seen that the **implementation of this task is well underway**. Several GenB partner foresee implementing additional events, also to pilot other items to be included in the forthcoming WP1 toolbox. The overall KPI has already been achieved successfully.

### 4.1.3 Main lessons learned

Through a series of hands-on activities, from games to adapting learning materials and developing bioeconomy related activities, during these workshops, teachers gained a better understanding of bioeconomy and how to including it into their lessons Already. Teachers find value in workshops and events where they are introduced directly with available materials and provided with an opportunity to explore them and, together with their peers, brainstorm how can be included into their existing curriculum. They can gain practical information and skills on how they can further include the topic into their teaching, according to the age and needs of their students.

## 4.2 Bioeconomy talks/seminars inquiry-based learning (T2.3b)

### 4.2.1 Concept of the format/activity and prior experience

Inquiry based learning (IBL) activities focus on asking questions and investigating real-world problems. IBL activities stimulate reflection and debate in the classroom or in science-related festivals and events (like European Researchers' Night). In this type of learning environment, participants are actively engaged in the learning process and are given the opportunity to explore their natural curiosities.

Bioeconomy talks/seminars will involve inquiry-based learning to stimulate students' reflection and debate on the topic of bioeconomy. The activity will involve organising talks or seminars where experts in the field of bioeconomy can share their knowledge and experiences with the students, who are given a chance to ask questions and take part in resulting discussions. By hearing from experts in the field, students (and their teachers) can gain a deeper understanding of the importance of bioeconomy and how it relates to their daily lives, as well as explore potential career opportunities. The duration of the bioeconomy talks/seminars inquiry-based learning activity will be typically in the order of 1-2 hours per group of students or classroom. The scope and content of the bioeconomy talks/seminars will depend on the context. The activities will be conducted either in collaboration with schools or in the context of events related to the bioeconomy (like for example festivals).

### 4.2.2 Activities implemented in GenB to date

All countries shall organise "*Bioeconomy talks/seminars inquiry-based learning*" in their respective countries. Target audiences are high school students (14-19 years old) and their teachers. As described below, the format has been applied already in various GenB countries, and the local editions of the 2024 EU Bioeconomy Changemakers Festival (BCF) proved a valuable delivery mechanism.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| Bioeconomy talks/ seminars inquiry-based learning |  | Inquiry based learning to stimulate students' reflection and debate; | #400 young people | AT, IT, SK, ES, EL, BE, PT, NL |

*Table 36 - WP2 format 2.3b: "Bioeconomy talks/ seminars" inquiry-based learning - key characteristics.*

In Vienna (**Austria**), ZSI staff implemented the "inquiry-based learning" format in a workshop held in the framework of the Vienna edition of the BCF. Workshop participants has been asked to write down questions during a previous session where they played a card game developed in the ZSI-coordinated Engage4Bio project. Armed with these questions, the participants entered the GenB session where three bioeconomy experts sat in a circle with two empty chairs. The rest of the participants stood around these chairs and had the possibility to go into the "fishbowl" to ask questions and get answers from experts or even from other workshop participants. Once the participant asking the question was satisfied with the answer, she/he could leave the fishbowl to give another participant a chance to ask their questions. The questions included among others:

- Is increasing efficiency in the economic chain in the interest of bioeconomy?
- Free trade and bioeconomy
- To what extent does bioeconomy affect consumer behaviour?
- In which areas will the changeover be the most difficult?
- in which areas will the changeover be the easiest?
- How much potential does bioeconomy have in the effectiveness of the Green Deal?
- Success in reaching the goals of the bioeconomy
- Describe in 1 minute the importance of bioeconomy in your work
- Evaluation of the bioeconomy strategies etc.


*Figure 23 - "inquiry-based learning" format in a workshop held in the framework of the Vienna edition of the BCF*

In **Greece**, HSPN incorporated the format in the hands-on lab activities implemented at Bodossaki Elementary School in Athens on 15 December 2023. More specifically, through an interactive audiovisual presentation, young students (7-9 y.o) were introduced to bioeconomy concepts in the form of an experiential seminar, where vivid Q&A sessions were initiated between the HSPN staff, students of different ages, and their teachers.

In **Italy**, the Italian partners APRE and FVA applied the format in combination with developing and piloting of a bioeconomy board game for young children and a serious game for teenagers:

- During the Italian Living labs (March-June 2023), APRE conducted 4 different inquiry-based learning workshops and hands-on activities with 1 elementary and 1 primary class of the IC Guicciardini school in Rome. The outcomes of these sessions was the development and testing of an educational board game on the bioeconomy concepts and bio-based products for 9-13 y.o. students (fully described in the D.1.3 as part of GenB toolkit).
- During the Fermo Living Labs (October 2023), FVA played multiple sessions of the "Escape4Future" escape game, a key outcome of the GenB Living Labs workshops organised in Italy in Spring 2023. "Escape4Future" integrates the inquiry-based learning approach to challenge the players in solving enigmas and quizzes on sustainability issues and bioeconomy.

In addition, on 10 May 2023, APRE and FVA jointly organised a seminar for 100 students of the Luigi Sturzo di Castellammare di Stabia high school. The GenB partners presented the

bioeconomy, the educational materials, the toolkits for teachers, the experience of the living labs, and the bioeconomy job profiles. By hearing APRE and FVA experts, the high school students (and their teachers) learned to understand the relevance of the bioeconomy and its impact on their daily lives. As a result, 7 students decided to become GenB Ambassadors. They have been involved in several GenB project activities such as the Italian Bioeconomy Changemakers Festival-Rome Edition.

In **Portugal**, in the context of the Bioeconomy Changemakers Festival held in Aveiro on the 14th of March 2024, a career booth was organised whose presentation was adapted to the audience's ages and scholarly degree in each session (3 sessions of 30 students each). For the youngest participants, the speech was simplified. For the oldest, the concept of green jobs was more explored because of their most considerable cognitive development and comprehension. The presentation was divided into five parts: First, the definition of sustainability and the importance of the usage of natural capital without compromising further generations. The second part was a brief presentation of the SDGs and their relevance. The importance of sustainability for future generations, the importance of the sustainable and circular bioeconomy, and innovation for developing new materials, where we could show – in the Bioeconomy Village format organised during the Satellite event – bio-based products like apple skin "leather" or smartphone cases made of seaweed. This allowed to link all classrooms sessions to the future of jobs, asking the audience about what they expected to be the green jobs that could arise and their importance for achieving the SDG's and a more sustainable future.

In **Slovakia**, the activity took place within the frames of the living lab workshops with the High-school students and also with the younger age groups. The series of workshops was built on interactivity, where PEDAL and the Gessayova Leisure Centre as facilitators gradually moved from topics familiar to students (such as climate change, resource depletion, sustainability) to the topic of bioeconomy. The workshops were designed to engage young people, express their opinions, ask questions, exchange information with each other. The goal was to create a game for which it was crucial for students to further educate themselves in the topic and expand their knowledge.

In addition to that, the format was implemented during the Bioeconomy Changemakers Festival, Nitra edition. PEDAL organized the activities for primary and elementary school students as a series of booths, letting the students explore bioeconomy through pictures, posters, samples of products and hands-on lab activities. The facilitator present at each of the booths introduced step by step the bioeconomy, its applications, jobs, examples of products from everyday life, and accompanied them through experiments. The facilitator gave young people only brief theoretical information and encouraged them to discover and ask questions. At each booth, pupils were asked to complete 1-2 quiz questions.

GenB partner EUN only works with teachers and educators and not directly with children. As part of the 39th Science Project Workshop (SPW39) and the teacher trainings organised in the Future Classroom Lab (FCL) in 2023, several groups of international, primary, and secondary school teachers and teacher trainers attended IBL seminars aimed at introducing teachers to the

basic terms of bioeconomy. A total of 55 international teachers and educators working in various levels of education, took part in inquiry-based seminars exploring the topic of bioeconomy, through the basic terms relevant in the field, connections to the curricula and relation to different fields such as arts and humanities.

Table 37 - WP2 format 2.3b: Bioeconomy talks/seminars inquiry-based learning - planned and implemented activities. gives a short overview of bioeconomy talks/ seminars" inquiry-based learning activities using the toolkits organised and planned by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| ZSI | Austria | T.b.d. | 12 Mar '24 | Bioeconomy Changemakers Festival in collaboration with BOKU | I |
| HSPN | Greece | Athens | 15 Dec '24 | Hands- on labs at Elementary School Bodossaki | I |
| FVA | Italy | Fermo | Apr '23 | Living Lab with high school students at High school "ITT Montani" | I |
| | | Rome | Oct '23 | Fermhamente | I |
| | | Lazio | Nov '23 – Feb '24 | Online webinars with Lazio Innova | I |
| | | Rome | Mar ' 24 | Bioeconomy Changemakers Festival | I |
| | | Enschede | Apr- Jun '24 | NMO, Bonhoeffer HS | Ip |
| APRE | Italy | Rome | March-May 2023 | 2 Living labs at IC Guicciardini school | I |
| | | Rome | March-May 2023 | 3 Hands on Labs at IC Guicciardini school | I |
| | | Rome | Sep '23 | EU Researchers' Night with Frascati Scienza | I |
| FVA & APRE | Italy | Rome | Oct '23 | Maker Faire | I |
| | | Aveiro | Mar '24 | Bioeconomy Changemakers Festival | I |
| | | Online | 10 May '23 | Scuola Luigi Sturzo di Castellammare di Stabia | I |
| LOBA | Portugal | Nitra | Mar '24 | Bioeconomy Changemakers Festival | I |
| PEDAL | Slovakia | Valencia | Apr '24 – Feb '25 | AIJU ToyLab Experience | Pl |

| | | | | | |
|---|---|---|---|---|---|
| AIJU | Spain | Brussels | 25 Mar '23 | Science Project Workshop (SPW) | I |
| EUN | Pan-European | Brussels | 17 Apr '23 | FCL teacher training | I |

*Table 37 - WP2 format 2.3b: Bioeconomy talks/seminars inquiry-based learning - planned and implemented activities.*: Status: Ip = In progress; Pt = Piloted; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 8 |
| Countries with implementation (largely) completed | 6 |
| Countries with ongoing or planned implementation | 2 |
| Events implemented | 12 |
| Participants engaged | More than 3300 (including 61 in AT, 3050 in IT, 70 students and 10 teachers in SK, and 55 in EU) |
| Targets to be engaged | 400 young people |

*Table 38 - WP2 format 2.3b: Bioeconomy talks/seminars inquiry-based learning - impact against KPI*

Commentato [JV9]: Based on 3.020 High school students (14-19 years old) and 30 Teachers. This sounds like an awful lot!

From the above two tables (on Activities and on Impact) it can be seen that **the implementation of this task is almost completed**. Several GenB partner foresee implementing additional events, also to pilot other items to be included in the forthcoming WP1 toolbox. The overall KPI has already been achieved successfully.

### 4.2.3 Main lessons learned

It was very helpful for the participants to engage in an activity before the fishbowl exercise – i.e. the card game – to formulate questions rather than doing it spontaneously as normally done with this method. It allowed for more thought-out questions.

The presence of different experts coming from different sectors enabled the participants to receive answers to their questions from different perspectives. When introduced with the basic terms and concepts of bioeconomy teachers shared that although bioeconomy as a term was new to them, the processes and ideas that it involves have been a part of their various lessons. Topics like circular economy, biomass, bio-based materials, or greenwashing have been covered in classes like geography, chemistry or civic education. This indicates that, although not explicitly mentioning the term, school curricula have been including the topic of sustainability and transition to more sustainable lifestyle and choices, providing information, and covering the topic from various aspects.

## 4.3 Online bio educational village" (T2.3c)

### 4.3.1 Concept of the format/activity and prior experience

**Concept:** The online bio educational village is a format whose aim is to offer a self-guided or facilitated online educational spaces, where the students can explore and navigate among educational activities. The format is very effective to introduce the bioeconomy through experiential learning and uses a gamified experience to convey different messages and inspire students in deepening the topics. The aim is to engage students and teachers through practice games, to build knowledge step by step using an informal, experiential approach.

**Inspirational previous experience:** Two virtual collaboration platforms from Italy targeting young people and using a gamified approach and avatars, are of interest. The first one, GECO For School, covers different sustainability topics, including circular economy. The second one, Gather Town, is a platform that provides a virtual context to foster collaboration, communication and facilitate team activities.

**GECO For School** is an online educational platform providing Italian secondary schools and students with educational modules related to sustainability. This initiative was launched for the first time in 2021 at which time FVA was contacted to contribute by providing contents related to the circular bioeconomy. The schools participating in the initiative can enter the platform on a pre-booked date and can freely explore the virtual space, using their personal 3D avatar. Several events are available, including live interaction and a series of educational content. Ultimately, they should have attended all the training modules and can complete the online gamified self-assessment session. Based on their scores, the best students can win educational prizes, made available by the GECO For School's partners.

**Gather Town** is an online collaboration platform providing a virtual context to foster collaboration, communication and facilitate team activities. It was implemented in the context of the TETRA project, in which FVA designed a webinar village where all the participants, thanks to an avatar, could explore, interact with people and objects and network with peers. When entering the village for the first time, it is possible to personalize the avatar and select the webcam, speakers, and microphone. While exploring the virtual environment, participants can control their avatars using the arrows keys on their keyboard and facilitators can activate assignments to actively engage them.

The objective of the Online bio educational village is to offer a blended learning experience, mixing online and offline learning to engage students and teachers in a virtual environment to be explored, which is engaging, fun and immersive. Learners learn through topics presented in images, audio, videos, and text. Students can work independently or in group, progressing through their learning journeys and having access to various settings and different levels of training materials, including short comprehension exercises, to consolidate learning.

### 4.3.2 Activities implemented in GenB to date

In Task 2.3c activities linked to online bio educational village were conducted by FVA, the only GenB partner charged with implementing this format. Targets include elementary school students (9-13 years old), high school students (14-19 years old), and their teachers.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| Online bio-educational village |  | Self-guided or facilitated online education activities | #5000 young people | Italy |

*Table 39 - WP2 formats to educate young people to promote the biotransition - key characteristics.*

FVA developed an online exhibition area providing students and teachers a learning environment. This includes a series of videos covering: (a) the circular and sustainable bioeconomy; (b) bioeconomy and sustainability challenges; (c) bioeconomy and controversial topics; (d) bioeconomy job profiles; (e) bio-based products in action. FVA's online exhibition is part of a wider educational village addressing sustainability topics (see pictures below).

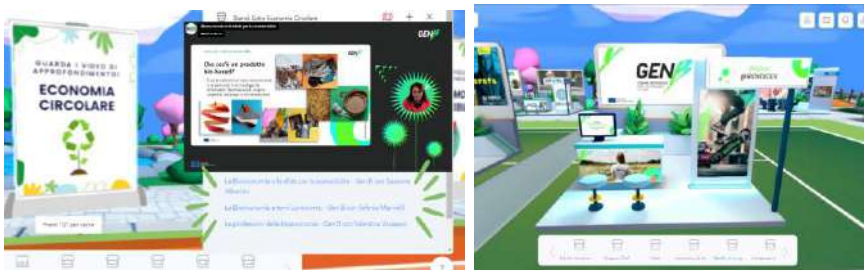



*Figure 24 - Online Bio Educational Village*

On 26 May 2023 the GECO For School award ceremony took place at NABA University, New Academy of Fine Arts in Milan. During the event, the initiative's partners were present, together with the GECO team and its scientific committee, to award the students who entered the national rankings and the winning classes of the national "Your Sustainable School" contest. GenB was represented by FVA to award the high school students who participated to the capacity building activity organized by the project (see pictures below).


*Figure 25 - Award for the high school students who participated to the capacity building activity*

FVA is evaluating the possibility to implement an English online escape game in Gather Town, building on the live escape game "Escape4Future: Chemistry meets Circular Bioeconomy", developed with Italian high school students involved in the context of the GenB Living Labs (WP1).

Table 40 - WP2 format 2.3c: Online bio-educational village - planned and implemented activities. gives a short overview of the online bio educational village organised by GenB partners.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| FVA | Italy | Online | Jan– May 2023 | GECO online platform in collaboration with GECO For School | I |
| | | Online | Late '24/beginning '25 | Gather Town | Pl |

*Table 40* - WP2 format 2.3c: Online bio-educational village - planned and implemented activities.

| Parameter | Value |
|---|---|
| Target countries | 1 |
| Countries with implementation (largely) completed | 1 |
| Countries with ongoing or planned implementation | 1 |
| Events implemented | 1 |
| Participants engaged | 6000 young people and teachers |
| Targets to be engaged | 5000 young people |

*Table 41 - WP2 format 2.3c: Online bio-educational village - impact against KPI per country*

From the above two tables (on Activities and on Impact) it can be seen that the implementation of this task is almost completed. Several GenB partner foresee implementing additional events, also to pilot other items to be included in the forthcoming WP1 toolbox. The overall KPI has already been achieved successfully.

Main lessons learned

The above-mentioned cases exemplify effective implementation of online educational experiences through gamification, allowing students and teachers to explore virtual environments and deepen educational content. In particular, GECO For School integrates gamified activities into existing initiatives, maximizing impact while partners focus on content delivery. Winners receive educational prizes, enhancing engagement.

## 4.4 Storytelling on bioeconomy for kids (FVA, APRE, HSPN)

### 4.4.1 Concept of the format/activity and prior experience

Storytelling is a valuable tool for raising environmental awareness in young children. It includes different types of outcomes (fairy tales, stories, poetry, riddles, podcasts). GenB partners have developed and piloted some of these products during the project implementation and plan to insert them into their GenB toolkits (see D.1.3 for details on the development of the toolkits following these formats) and educational materials by the end of the project.

### 4.4.2 Activities implemented in GenB to date

In **Italy**, the context of EU Researchers' Night (Frascati, September 2023) young GenB Ambassadors read the fairytale "*The Apple's Dream*". The reading was accompanied by cartoon style images projected in a big screen (FVA) Link. Detailed description of this format is provided in D1.3.

*Figure 26- Young GenB Ambassadors reading the fairy tale in the context of EU Researchers' Night 2023*

In addition, in the context of the «Sustainability Day» (Rome, 31 May 2023) students of an elementary class of the I.C Guicciardini school in Rome, with the facilitation of APRE, transformed a riddle on the bioeconomy into a rhymed rap song. The riddle, translated in English and presented here below, was further performed it in front of their school during an open-air event with parents and multipliers (see figure 27).

*Riddle on learning the bioeconomy through games - IC Guicciardini*

If you really want to learn,

it's us, you know, that you should play with.

This game is ours alone, come closer, come on, I'll show you!

So you too can do your part to create a more beautiful world instantly.

The game I'm talking about is the bioeconomy,

if you don't know it, it has to do with ecology!

Move the piece, then jump two spaces, because if you get it right, you'll get more points on those report cards!

From every waste a new life,

nothing is infinite, we have proof of this.

So help us reuse the many biomasses to avoid polluting,

from the sea to the countryside, the stable and the mountains,

everywhere there is a place where you can earn more.

Vegetable products to make new energy,

I tell you that this what the bioeconomy is!

But also clothes, soaps and packaging,

reusing waste gives nothing but advantages.

From flowers, to fishing to crops,

they are all biomass, not strange inventions.

Then they must be transformed in the bio-refinery,

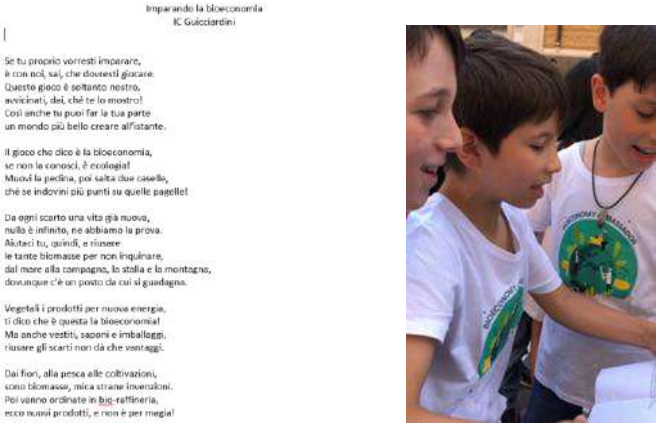
here are new products, and it's not by magic!

At home and at school, we too have many things to do,

organic waste by learning to transform,

because by buying greener products

There's a lot more fun than you think!



Imparando la bioeconomia
IC Guicciardini

Se tu proprio vorresti imparare,
è con noi, sai, che dovresti giocare.
Questo gioco è soltanto nostro,
avvicinati, dai, ché te lo mostro!
Così anche tu puoi far la tua parte
un mondo più bello creare all'istante.

Il gioco che dico è la bioeconomia,
se non la conosci, è ecologia!
Muovi la pedina, poi salta due caselle,
ché se indovini più punti su quelle pagelle!

Da ogni scarto una vita già nuova,
nulla è infinito, ne abbiamo la prova.
Aiutaci tu, quindi, a riusare
le tante biomasse per non inquinare,
dal mare alla campagna, la stalla e la montagna,
dovunque c'è un posto da cui si guadagna.

Vegetali i prodotti per nuova energia,
ti dico che è questa la bioeconomia!
Ma anche vestiti, saponi e imballaggi,
riusare gli scarti non dà che vantaggi.

Dai fiori, alla pesca alle coltivazioni,
sono biomasse, mica strane invenzioni.
Poi vanno ordinate in bio-raffineria,
ecco nuovi prodotti, e non è per magia!



*Figure 27 - Riddle on the bioeconomy transformed into a rap song and performed in an open day school event by children of 4th grade, Rome, Italy*

Finally, in **Greece**, in the context of the Hands-on labs experiential seminar at the Bodossaki Elementary School on December 15 2023, the members of the HSPN team used a short audiovisual presentation (PowerPoint presentation and short animated video accompanied by cheerful music) to engage young students of the 2nd, 3rd and 4th grade. The basic concepts of bioeconomy, fossil fuels and bio-based products are explained in a simple way through the eyes of Rita, an environmentally sensitive 1st grader and her journey towards more sustainable choices in life.


*Figure 28 - Short lesson on Bioeconomy in Greece*

Storytelling on bioeconomy is an additional format that was not foreseen/pre-identified in the GA. There is no KPI that has to be met. It was piloted by APRE and FVA and has already been adopted by HSPN. Further implementation and expansion of the format will be decided "on the way".

### 4.4.3 Main lessons learned

Young people feel owners of their learning through creative writing and performance techniques. Proving them with right instruments and guidance on how to express and communicate the bioeconomy in a creative and proactive manner enables them to learn about the contents in an easy and accessible manner and to express it also to other peers of the same age group.

# 5 Educate teachers in teaching the bioeconomy

Task 2.4 equips **teachers** with a package of knowledge and capacities based on the toolkits developed in WP1 to train their students in bioeconomy through online courses. The following formats (online course modules) will be developed/provided within this Task:

- Task 2.4a: Educating teachers in teaching "What's bioeconomy" MOOC
- Task 2.4b: Educating teachers in teaching "How to use GenB toolkits"
- Task 2.4c: Educating teachers in teaching "Bioeconomy job profiles"

Table 42 presents an overview of the Task 2.4 formats/activities to educate teachers in teaching the bioeconomy, the countries where activities will be implemented, and the associated Key Performance Indicators (KPIs).

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| What's bioeconomy" MOOC | | Training and equipping teachers using the GenB Massive Open Online Course (MOOC) | #800 teachers #12.000 students indirect | |
| How to use GenB toolkits | | Training and equipping teachers using the GenB toolkit/s | 3 toolkits | AT, IT, SK, ES, EL, BE, PT, NL |
| "Bioeconomy job profiles" on factsheets explanation | | Training and equipping teachers and career councillors using GenB job profiles | 4 job profiles | |

*Table 42 - WP2 formats to educate teachers in teaching the bioeconomy*

The organisation of the three sub-tasks has many elements in common, therefore these are described below under a single header. Targets include all three age groups of young people (1. Pre-school and early-school students; 2. Elementary school students, 3. High school students) and their teachers.

## 5.1 Educating teachers (T 2.4a 2.4b and 2.4c)

### 5.1.1 Concept of the format/activity and prior experience

The format "Educating teachers in teaching the bioeconomy"" smartly combines and integrates three elements: a massive open online course, the use of GenB toolkits and the use of bioeconomy job profiles.

A massive open online course (MOOC) or an open online course is an online course aimed at unlimited participation and open access via the Web. It is a high-quality free training course curated for teachers and educators from various educational settings and levels, that in addition

to traditional course materials, such as filmed lectures, readings, and problem sets, provide interactive user forums or social media discussions. Within GenB, EUN will develop and coordinate a MOOC intended for all target ages' teachers, based on the GenB toolkits and other available materials (BLOOM, Transitio2Bio, BIOVOICES, etc) compliant to the Seven Step Eco-Schools methodology. The GenB MOOC is aimed at training teachers on how to introduce the topic of bioeconomy in their classrooms and how to utilize the teaching materials developed within the Gen B Project.

The GenB Toolkits represent a compilation of materials and resources aimed at promoting knowledge and teaching methods for including Bioeconomy in school curricula and enabling the acquisition of significant learning on the subject. The educational activities within the toolkit aim to take advantage of the didactic potential of different materials and develop learning experiences that allow educating students in Bioeconomy by giving them a leading role in the ecological transition, in accordance with the goal of GenB. These activities will constitute practical cases of knowledge generation on Bioeconomy in real environments.

Bioeconomy job profiles are sets of teaching materials consisting of bioeconomy factsheets and interviews with bioeconomy experts, intended for high school (14-19 years old) and their teachers. These materials contain information and explanations of career and educational possibilities in the field of bioeconomy, featuring professionals that provide insights from the field to spread awareness, inspire and motivate high school learners to pursue a profession in bioeconomy. These formats would allow teachers to raise students' interest towards bioeconomy from the perspective of different science, technology, engineering and mathematics STEM and non-STEM fields that play an important role in the transition to circular and more sustainable lifestyles.

Prior experience with the elements of this format:

As part of the BLOOM project, EUN developed and coordinated the "Boosting Bioeconomy Knowledge in Schools" MOOC, an online flexible training platform for teachers interested in teaching bioeconomy as part of their STEM lessons. The basis of the MOOC was the BLOOM School Box, a collection of lesson plans co-created by 20 BLOOM pilot teachers from 10 countries, which illustrate how bioeconomy can be introduced in different STEM subjects.

EUN has implemented the Job Profiles format with great success as part of the STE(A)M IT project, in which a series of career profiles was developed, collected and published (see: https://steamit.eun.org/category/stem-careers/). These are intended for teachers and career counsellors to contextualize STEM careers in the classroom, to inform and inspire secondary school students to pursue STEM careers.

#### 5.1.2 Activities implemented in GenB to date

**"What's bioeconomy" MOOC**

The "What's bioeconomy" MOOC will be developed and organized for teachers of all target groups. However, other educators from various educational settings are welcome to participate in the MOOC and tailor the training course/information to their educational settings. The course will include a compilation of the materials and resources included in the Toolkit that GenB has developed, designed to enhance understanding of the bioeconomy and facilitate substantial learning on the subject for various target groups. In addition, through the MOOC participants will be introduced to the 7-Steps of Eco-Schools Methodology, a series of measures to guide schools in becoming more environmentally sustainable, while involving the whole school community in the process. By following the course, teachers and educators that are interested in the field of bioeconomy education will be able to delve into the field and discover its significance and practical applications in teaching by getting acquainted with the resources of the Toolkit.

The objective of the "What's bioeconomy" MOOC is to train teachers for all target ages in teaching bioeconomy by providing them with an introduction in the bioeconomy field and applications in teaching. In short, through this MOOC, teachers will:

- Familiarise themselves and gain deeper understanding of various concepts that are central in the field of Bioeconomy.
- Identify bioeconomy's significance in everyday life and classroom practices.
- Know what the GenB project is, and how it can help innovate their classroom practices.
- Discover and navigate innovative ways of engaging students in the learning process through a methodical exploration of GenB toolkits.
- Gain awareness about the required skills and career opportunities in the field of bioeconomy.
- Learn to design and implement bioeconomy related activities within the school, through the analysis of best practices and collaboration with peers.
- Engage in a collaborative learning experience with their peers and co-develop a Bioeconomy Learning Activity applying the skills and knowledge gained through the course.

The MOOC will initially be run on the European Schoolnet Academy Platform (EUNA Platform), and the associated materials will remain available at this platform. Upon finalisation of the MOOC, GenB partners may additionally host the educational materials on their own platforms and on the GenB website.

The MOOC and the associated materials will be prepared in the English language. However, GenB partners may translate (part of) the MOOC material in their national languages, as they see fit.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| What's bioeconomy" MOOC |  | Training and equipping teachers using the GenB Massive Open Online Course (MOOC) | #800 teachers #12.000 students indirect | AT, IT, SK, ES, EL, BE, PT, NL |

*Table 43 - WP2 format 2.4a: Educating teachers in teaching "What's bioeconomy" MOOC - key characteristics.*

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| How to use GenB toolkits |  | Training and equipping teachers using the GenB toolkit/s | 3 toolkits | AT, IT, SK, ES, EL, BE, PT, NL |

*Table 44- WP2 format 2.4b: Educating teachers in teaching "How to use GenB toolkits" - key characteristics.*

**Implementation progress**

Task leader EUN will develop the structure and the content of the educational items to be used in Task 2.4 (the MOOC, the toolkit for teachers, and the job profiles) in close collaboration with GenB partners. The content production will follow a process of drafting, validating, and aligning content (videos, text resources) with project guidelines, visual identity, and production of teaching materials. Once the educational item is ready for running, GenB partners will be asked to disseminate it by organising online workshops for their networks in their countries. The duration of each online workshop will be about 1 hour.

EUN has presented a toolkit of materials to teach bioeconomy topics to international teachers during various events organized within GenB T2.3a "*Educational activities using the toolkit*". See the relevant Chapter of this deliverable.

EUN has introduced the job profiles to an audience of international teachers, that participated in various online events, such as the online workshop that was part of the Science Project Online Workshop 17 (SPOW17): '*Sustainability in and outside of the classroom: from Bioeconomy to Nature-Based-Solutions*', FCL Teacher Training and the Informative webinar, all of them taking place in 2024. During these online events, participants learned about the different careers in the bioeconomy field, the different job profiles developed within the project as well as the available materials regarding the introduction of careers in their lessons. Additionally, the various Job Profiles developed in GenB are part of the materials listed for the Scientix-Bioeconomy Awards that teachers can use to organize Bioeconomy activities. In various GenB partner countries, initial experience has been gained using GenB teaching materials to educate teachers.

In **Italy**, FVA and APRE implemented intensive capacity building for primary school teachers called "*Teaching the circular bioeconomy to kids*" in Nov-Dec 2022, March 2023 and in Jan-Feb 2024. The training aimed at empowering teachers of the primary schools with insightful

contents, educational materials, and inspirational case studies on the bioeconomy and bio-based products. The trainings performed in 2022 and in 2024 were delivered on the "S.O.F.I.A." platform of the Italian Ministry of Education, providing teachers with professional credits. The teachers that successfully completed the trainings were provided with 30 hardcopies of the book for kids "What's Bioeconomy?" to be distributed to their students.


*Figure 29 - Teaching the circular bioeconomy to kids at the "S.O.F.I.A." platform of the Italian Ministry of Education*

In **Greece**, Q-PLAN organised the satellite event "Careers and opportunities in the Bioeconomy sector" at the Ok!Thess innovation hub in Thessaloniki on 14 March 2024. The daylong event was full of informative sessions and inspirational storytelling, aimed at providing students and young professionals with practical information on how to start a career in bioeconomy, advance their skills and knowledge, as well as to pursue employment and entrepreneurial opportunities in Thessaloniki and Central Macedonia. More than 40 young professionals, academics and students participated.

In **Portugal**, together with a range of other organisations, and in connection with Pi day and the national mathematical games championships, LOBA organised the Aveiro satellite of the Bioeconomy Changemakers Festival on XX March 2024. More than 1,800 students from every corner of Portugal participated in the games competition, and in this context, GenB organised the Bioeconomy Village, Hands-on labs and a Career Booth to inspire and inform students from 7 to 18 years old. The concept of green jobs was explored the older students.

In **Slovakia**, to pilot educating teachers in teaching "Bioeconomy job profiles", PEDAL took advantage of the *You(th) in and for bio-regions Conference*, the local event that it organised as part of the Nitra satellite event of the EC's Bioeconomy Changemakers Festival, in March 2024. At the event, PEDAL organised a presentation of future jobs in bioeconomy within the frames of career talks, featuring young scientists, entrepreneurs/start-ups, student companies/projects, and initiatives.

Table 45 - WP2 format 2.4a/b/c: Activities to educate teachers in teaching the bioeconomy - planned and implemented. gives an overview of activities planned to educate teachers in teaching the bioeconomy.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| ZSI | Austria | | Apr '24 – Feb '25 | | Pl |
| HSPN | Greece | Athens | Apr '24 – Feb '25 | HSPN T-T-T workshops and FEE events for teachers and educations | Pl |
| FVA & APRE | Italy | Online | Nov-Dec '22, Mar '23 & Jan-Feb '24 | Training for teachers | I |
| | | Online | Oct '24 | Training for teachers | Pl |
| FVA | | Lazio | Nov '23 – Feb '24 | Startupper School Acad. at Lazio Innova | I |
| BTG | Netherlands | | Sep '24 – Feb '25 | | Pl |
| LOBA | Portugal | Aveiro | Mar '24 | Bioeconomy Changemakers Festival in collaboration with Fabrica and Univ. of Aviero | I |
| PEDAL | Slovakia | Nitra | Mar '24 | Bioeconomy Changemakers Festival | I |
| AIJU | Spain | Valencia | SY '23-'24 | Educational centers | Pl |
| EUN | Pan-European | Brussels & Online | Mar '23-Mar '24 | FCL training courses, SPOW, Informative webinar within 2024 SDC, SPW | I |
| | | Brussels & Online | Feb '24 – Feb '25 | 2024 SDC, SPW, EUNA | Pl |

*Table 45 - WP2 format 2.4a/b/c: Activities to educate teachers in teaching the bioeconomy - planned and implemented.*: Status: Pt = Piloted; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 8 |
| Countries with implementation (largely) completed | 4 |
| Countries with ongoing or planned implementation | 5 |
| Events implemented | 7 |
| Participants engaged | > 250 teachers and >5000 Young people indirect (incl. >100 Teachers & 2.000 Young people indirect in IT; 10 Teachers & 200 Young people indirect in SK; and 153 Teachers & 3.060 Young people indirect in EU) |

| | |
|---|---|
| Targets to be engaged | 800 teachers and 12.000 students (indirect) |
| KPI #2 | 3 toolkits in each country |
| KPI #2 progress | 3 (preliminary) toolkits established |
| KPI #3 | 4 job profiles in each country |
| KPI #3 progress | 4 (preliminary) job profiles established |

*Table 46 - WP2 format 2.4a/b/c: Activities to educate teachers in teaching the bioeconomy - impact against KPI*

From the text and from the two tables above (on Activities and on Impact) it can be seen that the planning of the MOOC is at an advanced stage. **Several activities have already been piloted or implemented targeting teachers.** Draft versions of the toolkits and the job profiles (in various languages) will be available shortly. Task implementation is anticipated to speed up once these materials are available.

### 5.1.3 Main lessons learned

Combining one or more Task 2.4 sub-tasks with extra-curricular activities to consolidate the curriculum taught in lessons is promoted. Although for some teachers the term of bioeconomy was a new word, they referred that many concepts and processes related to the bioeconomy had already studied in their lessons (e.g. circular economy, re-use of wasted bio-masses). In addition, the teachers told APRE and FVA that having received the educational material from the first of the three sessions would help them to understand the next session and support them in future school green initiatives.

# 6 Inform and educate other multipliers to promote the bioeconomy

Task 2.5 engages and supports **non-formal educators** (such as museums, theatres, festivals, fairs, amusement parks, journalists, NGOs, science communicators, media producers, etc.) that work with young generations to act as multipliers by adopting the GenB toolkits as part of their activities. The following formats will be developed/provided:

- Task 2.5a: Informative webinar in partners' countries
- Task 2.5b: individual meetings with 3 multipliers in each country

Table 47 presents an overview of the Task 2.5 formats/activities to inform and educate other multipliers to promote the bioeconomy, the countries where activities will be implemented, and the associated Key Performance Indicators (KPIs).

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| 8 informative webinars in partners' countries (one each) |  | "How to embed bioeconomy in informal education settings".<br><br>Engaging multipliers to adopt GenB toolkits. | #80 multipliers<br>#4.000 young people indirect | AT, IT, SK, ES, EL, BE, PT, NL |
| 24 individual meetings (3 multipliers in each partner country) | | | | |

*Table 47 - WP2 formats to inform and educate other multipliers to promote the bioeconomy*

## 6.1 Informative webinar with multipliers (T2.5a)

### 6.1.1 Concept of the format/activity and prior experience

The aim of the webinars is to empower organizations outside the GenB consortium working with young people and are able to raise awareness or educate about the bioeconomy through their activities. According to the GA multipliers can include various non-formal educators, such as museums, theatres, festivals, fairs, amusement parks, journalists, NGOs, science communicators, media producers, etc.

Withing the GenB project, 8 informative webinars will be organized, while our goal is to ensure capacity building of at least 80 multipliers. This means that at least 1 webinar will be organized per project country, attended by at least 10 participants.

The aim of the webinars is both to introduce the bioeconomy and to show concrete examples of how bioeconomy can be presented or taught in their activities. A series of modules will be created that project partners will be able to adapt to the type of multipliers attending the webinar in their country, providing a practical webinar. The webinar builds up on Task 1.4 and its results (a set of GenB Toolkits). In addition to that, GenB has collected several tools, materials

from and is developing new ones. The team can also offer the experience gained in various activities aimed at awareness-raising, informing, or educating about bioeconomy.

### 6.1.2 Activities implemented in GenB to date

In Task 2.5a an informative webinar will be organised in each GenB partner country. The webinar will typically last up to 2 hours. The webinars build capacities outside the GenB consortium and empower multipliers in GenB countries with the aim to continue the efforts in raising awareness, informing, and educating young people about bioeconomy and increase the impact of GenB in partner countries.

A series of webinar modules (recordings) presenting various topics related to bioeconomy will be prepared in collaboration with GenB partners. Each partner will have the opportunity to adjust the content of its informative webinar to the type of multipliers in their countries, their level of knowledge, the type of activities conducted by the multipliers or planned to be carried out within GenB.

The webinar will provide information on content related to the bioeconomy and to the GenB Project. Each webinar will be implemented online either as a stand-alone activity or as part of a larger online event relevant to the bioeconomy.

All GenB partners and countries will participate in Task 2.5a. Most of the informative webinars are anticipated to be implemented in the second reporting period (PR2; May 2024 - April 2025), when the Task 1.4 outcomes (the relevant GenB toolkits) will be available. Nonetheless, some experience has been gained in the first reporting period (PR1).

In **Italy**, APRE piloted the format in autumn 2023. In the context of RuralBioUp, APRE recorded video training materials for regional facilitators on teaching toolkits and experiential formats/activities to teach bioeconomy in schools (October 2023) and on future career opportunities in the bioeconomy for young adults (November 2023). In PR2, APRE plans to organise webinars for (i) ECSITE, the European network of science centres and museums and (ii) Biblioteche di Roma, the network of libraries of Rome.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|
| 8 informative webinars |  | How to embed bioeconomy in informal education settings. | #80 plus #24 multipliers; #4.000 young people indirect | AT, IT, SK, ES, EL, BE, PT, NL |

*Table 48 - WP2 format 2.5a: Informative webinar with multipliers - key characteristics.*

Also in **Italy**, in February 2024, FVA implemented a training webinar on bioeconomy with Lazio Innova, which supports innovation and economic development in Lazio Region (see picture below). Multipliers from the eight FabLabs of Lazio Innova were empowered with GenB contents, tools, formats and gamified solutions, to foster their replication in the region and engage younger generations, also in light of the satellite events organized in the Lazio Region

for the Italian Bioeconomy Changemakers Festival - Rome edition. The event involved 27 multipliers.

*Figure 30 - Informative webinar on bioeconomy with Lazio Innova*

Partner EUN organised an informative webinar 'How to embed bioeconomy in non-formal and informal education settings' in collaboration with Scientix in the context of the 2024 STEM Discovery Campaign. The webinar was open to various target groups, whilst the participation was ensured by registering to the event. The webinar was conducted on 20 March 2024, and led by a distinguished Scientix Ambassador, expert in non-formal education. The webinar aimed to equip participants with invaluable insights and resources for integrating bioeconomy topics into educational programs. During the webinar, the speaker shared his experience with implementing bioeconomy as part of his various activities mainly with students aged 6 to 14. In addition, he introduced the audience with different GenB materials and formats that they can implement in their educational settings. The event was attended by 26 multipliers, mainly educators teaching in formal education from 15 countries in Europe and beyond.

Table 49 - WP2 format 2.5a: Informative webinar in partners' countries - planned and implemented activities. gives a short overview of planned and implemented informative webinars in GenB partners' countries.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| ZSI | Austria | Online | Apr '24 – Feb '25 | With other BE event | PI |
| HSPN | Greece | Athens/ Online | After Apr '24 | TBD | PI |
| Q-PLAN | Greece | Thessaloniki / Online | After Apr '24 | TBD | PI |
| APRE | Italy | Online | Oct-Nov '23 | Events for regional facilitators, RuralBioUp | Pt |
| | | Online | '24 | Events for Bibli. Di Roma, WWF and ECSITE | PI |

| | | | | | |
|---|---|---|---|---|---|
| FVA | Italy | Online | Sep '23 | Events for regional facilitators, RuralBioUp | I |
| | | Online | Feb '24 | Training activity at FabLabs Lazio Innova | I |
| BTG | Netherlands | Online | After Apr '24 | TBD | PI |
| LOBA | Portugal | Aveiro | Sep – Oct '24 | With another BE event in collaboration with Fabrica | PI |
| PEDAL | Slovakia | Online | | TBD | PI |
| AIJU | Spain | Online | Apr '24 – Feb '25 | TBD | PI |
| EUN | Pan-European | Online | 20 Mar 2024 | 2024 SDC in collaboration with Scientix, Natalija Budinski, Scientix Ambassador | I |

*Table 49 - WP2 format 2.5a: Informative webinar in partners' countries - planned and implemented activities.*: Status: Pt = Piloted; I= Implemented; PI = Planned*

| Parameter | Value |
|---|---|
| Target countries | 8 |
| Countries with implementation (largely) completed | 2 |
| Countries with ongoing or planned implementation | 7 |
| Events implemented | 4 |
| Participants engaged | > 50 multipliers plus >700 Young people indirect (incl. 27 Multipliers & 200 Young people indirect in IT, and 26 Multipliers & 520 Young people indirect in EUN) |
| Targets to be engaged | 80 multipliers (10 per country) |
| KPI #2 | 4000 young people (indirect) |
| KPI #2 progress | ### |

*Table 50 - WP2 format 2.5a: Informative webinars and Individual meetings - impact against KPI*

From the text and from the two tables above (on Activities and on Impact) it can be seen that **several activities have already been piloted or implemented targeting multipliers.** Draft versions of the toolkits (in various languages) will be available shortly. Task implementation is anticipated to speed up once the relevant toolkit is available.

### 6.1.3 Main lessons learned

To empower the multipliers, it is necessary to show practical examples, as close as possible to the core activities of the participating multipliers. Based on registration, we recommend

reviewing the focus and activities of participants and based on this, providing tailor-made webinar content in addition to general information on the bioeconomy.

During the Pan-European webinar it has been reflected on the difficulties non-formal and informal educators have in efforts to collaborate with schools on different programs and activities. It is still a common practice of starting the collaboration from personal contacts, which limits the reach of the programs. The speaker emphasized the importance of fostering and enhancing collaborations with formal-education institutions and creating a more targeted programs for schools.

## 6.2 Individual meetings with multipliers (T2.5b)

### 6.2.1 Concept of the format/activity and prior experience

The activity aims at expanding the network of cooperating organizations in partner countries. Meetings with various multipliers (see section 6.1) will allow to increase the impact of the GenB project partners.

The aim of these meetings is to inform multipliers about the activities of the GenB project, available materials, tools, and activities, thus enabling these organizations to further replicate the activities implemented by the GenB project or organize their own activities. Meetings can result in closer cooperation, for example in the form of joint activities and they can be also invited to the webinar.

Within GenB, meetings with 24 multipliers should be organized, meaning at least 3 meetings should be organized by individual partners.

GenB living labs were the first activities where partners from Austria, Italy and Slovakia had the opportunity to establish contact with multipliers. In the case of Slovakia, cooperation was established with the Gessayova Leisure Centre. At the introductory meeting, basic information about the project and planned activities was provided. The interview was aimed at finding out further opportunities for cooperation, as well as materials and support of GenB in possible activities. In the next phase, workshops in schools within the living lab were carried out together.

### 6.2.2 Activities implemented in GenB to date

In Task 2.5b three (3) individual meetings with different multipliers will be organised in each of the GenB partner countries. The meetings will be held either as online or physical event. The key purpose of the individual meetings is to develop closer collaboration with selected multipliers in future GenB activities. The meeting will typically last up to 1 hour. At the meeting, the GenB project, the GenB formats (e.g. the Living Labs organised within WP1 in Austria, Italy, and Slovakia, see D1.2 Report on co-design activities) and the educational materials that have been, or are being, developed (such as the GenB toolkits, see sub-task T2.3a *Educational activities using the toolkits*) and that can serve as inspirational experience will be presented.

| Activity | Target | What for | KPI | Target Countries |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 24 individual meetings |  | Engaging multipliers to adopt GenB toolkits. | #80 plus #24 multipliers; #4.000 young people indirect | AT, IT, SK, ES, EL, BE, PT, NL |

*Table 51 - WP2 format 2.5b: individual meetings with multipliers - key characteristics.*

All GenB partners and countries will participate in Task 2.5b. Most of the informative webinars are anticipated to be implemented in the second reporting period (PR2; May 2024 - April 2025), when the Task 1.4 outcomes (the relevant GenB toolkits) will be available. Nonetheless, some experience has been gained in the first reporting period (PR1).

In **Austria**, ZSI held 1-on-1 meetings with different multipliers. All took place online.

- Gottfried Hebenstreit, consultant of economic and energy policy and Ökosiziale Forum Österreich und Europa to discuss collaboration with GenB project. As a result, ZSI staff presented the GenB project to the audience of about 500 people from the sector, hosted a stand and implemented the online BioArt Gallery at the bioeconomy Austria summit 2023 on 7 November 2023.
- Maia Bristol, sustainability coordinator of St. Gilgen eco school to discuss collaboration in GenB activities. As a result, GenB will take part in the climate solution conference organised by the school on 26-27 April 2024. The contact with Maia was established after she contacted ZSI once she realised that ZSI was the Austrian partner at the GenB common grounds camp. She participated in the event online.
- Matthias Slatner, innovations manager at ACIB GmbH which has been organising the European Researchers Night in Graz and upper Austria for the past couple of years to discuss possible collaboration. The contact was made at the Bioeconomy Austria Summit event. The meeting held in early 2024 year secured the participation of GenB at the next European Researcher's night in Graz (September 2024).

In **Greece**, Q-PLAN has implemented awareness activities to prepare the ground for the 1-1 meetings and webinars through networking with relevant actors at external events. The activities of this task are planned to start after April 2024, and as soon as the GenB toolkit is launched in Greek.

In **Italy**, APRE organised several one-to-one online informative webinars with different type of multipliers, presenting the project and the main activities, as well as the results and exploitable formats with the aim to educate and train the multipliers, by utilising the developed formats and materials. Moreover, early in the project, FVA organised a first individual meeting with BioEco Academy Grand Est (France), to present replicable formats in their context and discuss possible capacity building/webinars for the team. Sine that initial meeting FVA and APRE have established various additional contacts (see table below).

In The **Netherlands**, BTG has held many 1-on-1 meeting with non-formal education providers. Among the most successful and impactful are:

- An online meeting held in autumn 2023 with the environmental education NGO with Natuur- en Milieu Overijssel (NMO). This meeting became the starting point of a collaboration between the secondary school Bonhoeffer College and BTG, in the context of the NMO programme Advisors of the Future. Within this programme, pupils of Bonhoeffer College will develop various bioeconomy-related games and game concepts.
- A face-to-face meeting held on 14 November 2023 in Delfzijl, which led to the collaboration with foundation Stichting Groener Groningen, organisers of the sustainable fashion festival Kleer'nZooi (to be held in October 2024 in Groningen)
- An online meeting held in November 2023, followed by a face-to-face meeting held in The Hague on 15 December 2024. This was the starting point for a broad and successful collaboration with the educational museum Museon-Omniversum in The Hague. See Chapter 3.
- An online meeting held on 8 March 2024, which led to the collaboration with the organisers of Expeditie NEXT, the main national science festival, held annually in a different location in The Netherlands.

In **Portugal**, LOBA held individual meetings with different multipliers in the context of the organisation of WP2 events and formats in Aveiro and online, namely: Planetiers World Gathering organisers (GenB participation in Planetiers World Gathering 2023), Ludus Association, the Association of Mathematics Teachers, the Portuguese Mathematics Society, and Agência Ciência Viva, University of Aveiro (Bioeconomy Changemakers Festival, Aveiro edition), four schools of the 1º ciclo of the municipality of Gaia (planned events in May 2024).

**Pan-European:** As GenB partner EUN does not work with other multipliers than Ministries of Education or formal education teachers, they organised this activity as a short video, part of a Scientix TV episode, featuring educators discussing different STEM topics applicable in non-STEM subjects and fields. Among other topics, teachers discussed bioeconomy and GenB project, as well as the benefits of including the topic of bioeconomy. EUN's video has been disseminated across a wide range of project multipliers, such as Ministries of Education, policymakers, teachers, non-formal educators, industry, researchers and beyond.

Table 52 - WP2 format 2.5b: individual meetings with multipliers - planned and implemented activities.*: Status: Pt = Piloted; I= Implemented; Pl = Planned

gives a short overview of organised and planned informative webinars in GenB partners' countries.

| Partner | Country | Venue(s) | Date(s) | Context | Status |
|---|---|---|---|---|---|
| ZSI | Austria | Vienna | Nov '23 – Feb '25 | Ökosoziales Forum Österreich; St. Gilgen eco school; ACIB GmbH | I |

| | | | | | |
|---|---|---|---|---|---|
| Q-PLAN | Greece | Thessaloniki / Online | In or after Apr ‘24 | TBD | PI |
| APRE | Italy | Roma | Mar ‘24 | WWF Italia | I |
| | | Online | Dic ‘23 | Office of the Premiership | I |
| | | Online | Dic ‘23 | UNITELMA Sapienza (Circular Bricks Coordinator) | I |
| | | Online | Apr ‘24 | Brillian HEU project | I |
| | | Online | Mar ‘23 | Festival della Scienza di Genova 2023 | I |
| | | Online | Jun ‘23 | Trieste Next 2023 | I |
| | | Online | Mar ‘24 | La Piazza SRL Media company | I |
| | | Online | Apr ‘24 | ANCI (Association of the Italian municipalities) partner of the H2020 HOOP project | I |
| | | Online | Apr ‘24 | MOMO Editor | I |
| | | Roma | Sep ‘24 - Feb ‘25 | Bibli. Di Roma, ECSITE | PI |
| FVA | Italy | Online | Apr ’23 – Feb ‘24 | Various in collaboration with CMQ Bioeco Academy, INPS, Sapienza University of Rome, Novamont, EU4Ocean | I |
| BTG | Netherlands | Across NL | Mar ‘23 | NMO; St Groener Groningen; Museon; Expeditie NeXT organisers | PI |
| LOBA | Portugal | Aveiro / Online | Sep ’23 – Mar ‘24 | Organisation of WP2 events | I/PI |
| PEDAL | Slovakia | Bratislava & Zilina region | Dec ’22 – Apr ‘23 | With Leisure centre Gessayova, Bratislava, Development Agency of the Zilina region, Development Agency of the Banska Bystrica region, Europe Direct Nitra, Slovak Eco-Quality | I |

**Commentato [LM10]:** Chiara vogliamo aggiungere anche Morone, Unitelma?

**Commentato [LM11]:** @flavia vuoi aggiungere anche il meeting con HOOP?

| | | | | | |
|---|---|---|---|---|---|
| AIJU | Spain | Valencia | Sep '23 – Feb '25 | TBD | Pl |
| EUN | Pan-European | Online | Jun' 23 | Video recording with Scientix | I |

*Table 52 - WP2 format 2.5b: individual meetings with multipliers - planned and implemented activities.*: Status: Pt = Piloted; I= Implemented; Pl = Planned*

| Parameter | Value |
|---|---|
| Target countries | 8 |
| Countries with implementation (largely) completed | 4 |
| Countries with ongoing or planned implementation | 5 |
| Events implemented | >10 |
| Participants engaged | > 1000 multipliers plus >1200 Young people indirect (incl. 3 Multipliers & 700 Young people indirect in AT, 13 Multipliers in IT, 5 multipliers & 500 Young people indirect in SK and 985 Multipliers in EUN) |
| Targets to be engaged | 80 multipliers (10 per country) |
| KPI #2 | 4000 young people (indirect) |
| KPI #2 progress | ### |

*Table 53 - WP2 format 2.5a: Informative webinars and Individual meetings - impact against KPI*

From the text and from the two tables above (on Activities and on Impact) it can be seen that **several activities have already been piloted or implemented targeting multipliers.** Draft versions of the toolkits (in various languages) will be available shortly. Task implementation is anticipated to speed up once the relevant toolkit is available.

### 6.2.3 Main lessons learned

The meetings with multipliers showed the interest of organisations in the topic of the bioeconomy. At the same time, however, awareness of this topic is low, even among organisations working on the topic of sustainability or the environment. For further cooperation, it is important to find a connection with their current activities and offer materials, activities that can be further used by organizations. Organizations working with children particularly appreciated the book "What's Bioeconomy?". For other activities, it might be needed to show examples of specific activities using the materials, or directly organize a joint activity.

Bioeconomy related events are a great place to network and connect with people who have similar goals to that of the project, hence enabling collaboration.

# 7 Conclusions

## General conclusions and observations

Work in WP2 involves the implementation of a **wide variety of activities/formats across GenB partner countries**. The partners have a certain flexibility how they apply certain format in their country or region. Since the start of WP2 all GenB partners have started implementing them with a lot of enthusiasm.

**Collaboration** is always sought with (formal and non-formal) **educators and other multipliers**. This requires GenB partners to monitor the offering of (science, innovation, and sustainability) festivals in their respective geographies and of other opportunities to work with educators and multipliers.

Where, and to the extent, needed GenB activities in WP2 are **tweaked to best fit the local context and setting**, to achieve synergies and maximum impact. This also means that the exact timing of implementing the GenB activity may be dictated by the local situation and/or collaboration partner.

**Good examples of successful collaboration** are the national satellite events (co-) organised in the context of the EC Bioeconomy Changemakers Festival in March 2024. By working together with other (European and national) projects, and with key public and private bioeconomy actors (such as universities, governments, companies) GenB partners in Greece, Italy, Portugal, and Slovakia succeeded in implementing diverse and entertaining packages combining awareness raising, knowledge exchange, and informing on jobs and career opportunities. This type of collaboration is just one example of the many established in GenB.

According to the GA, WP2 started in M6 and will finish by M28 i.e. 28 February 2025. April 2024 is M18 and thus partners have another ten months to complete their activities. Nonetheless, for several formats the overall key performance indicator (KPI) has already been achieved. Examples are the hands-on labs in Task 2.1 and the schools' projects to grow future entrepreneurs in Task 2.2. For other formats, work is still in (advanced) planning stage. Examples are the a day in a biorefinery study visit in Task 2.2 and most formats in Tasks 2.4 and 2.5. The latter is fully in line with expectations, as the GA states that tasks T2.3-T2.5 will build on the T1.4 toolbox, which is due in M18.

In the implementation of WP2 activities/formats, **smart use is being made of the legacy** of earlier EC-funded bioeconomy awareness raising projects, such as BioBridges, BioVoices, BioWays, BLOOM, and Transition2Bio. Where suitable and practical, GenB builds on, expands, and/or improves existing tools and materials, including bio-based product collections, D&C materials, good practice examples, etc. A full overview of materials developed by GenB partners in these earlier projects is available in the online repository of GenB. For usage with GenB target groups, in particular young people 5-19 y.o., in GenB countries, and in a specific context and setting, existing materials normally need to be modified i.e. translated into relevant languages,

refined to reflect local/regional preferences/opportunities, and reworded in an appropriate tone of voice.

Beyond this "upcycling" of existing materials, for use in other countries and settings, partners also **develop and pilot innovative formats and associated educational materials** in GenB. Examples of these are Inside the Bioeconomy experiential exhibit in Task 2.1 and the Role-play game on bioeconomy jobs in schools in Task 2.2. In some cases, additional formats and associated materials were developed and piloted that were not even foreseen/pre-identified in the GA. Examples include **Participatory photography** (categorised under Task 2.1, described in Section 3.5) and **Storytelling on bioeconomy for kids** (categorised under Task 2.3, described in Section 5.4)

Just like the existing formats, these new formats are also **finding their way from one GenB country to the other**. To help identify such international exchange opportunities, GenB partners periodically exchange overviews of their planned activities in WP2.

Due to the large number of WP2 formats and activities, and the need to adjust to time windows often set by external parties, **day-to-day monitoring of WP2 implementation** is not an easy task. Even if they wanted, the task leaders and the WP leader have limited room to steer the WP2 implementation in each country. General WP2 implementation progress is monitored instead by updating the joint Implementation Plan (D2.1) every six months and by country-by-country discussion of planned activities every three months.

### Format-specific observations

Implementation of WP2 activities and formats is still in full swing, therefore it is too early days to draw firm conclusions on the effectiveness of a given format. Nonetheless, a few things are worth noting.

In general, **combining different formats seems to be a good idea**. The different elements can strengthen each other. Frequently occurring is the combination of hands-on activities for young kids, BioArt Gallery roll-up banners, and the bio-based product collection. But other combinations can be effective too, as proven during the satellite events organised in 4 GenB countries in the context of the EC Bioeconomy Changemakers Festival in March 2024.

Also, in the implemented schools' projects to grown future bioeconomy entrepreneurs it was concluded that leveraging existing, well-established initiatives (like the Startupper School Academy and Bioeconomy4YOU for school projects) offers numerous advantages. These initiatives yield higher impact compared to standalone projects, since they benefit from greater promotional resources and organizational support, and reach a wider visibility through partners' communication channels, including media coverage. In addition, collaboration with external partners enriches programme content and prize offerings. The capacity building package developed in the schools' projects can be used in other GenB tasks or activities. In is key that tutors responsible to follow the students in their day-by-day implementation of the programme are empowered to ensure a valuable outcome for the school project.

From the implemented **career info days**, it was concluded that the format is a learning opportunity not only for students, but also for seasoned professionals who learn how to invite young and future professionals to join through imaginative and practical ways. The participation of **young speakers** was attractive for the audience who empathised more easily with the speakers. Moreover, younger speakers used a simple language enriched by practical examples that support the students to become familiar with the different green job sectors. **Targeting individuals who must choose their study or work pathway** (such as students in the final years of high school, young adults, and early-stage professionals) is most meaningful. There is a higher probability for them to make career choices in sustainable fields in general, and bioeconomy in particular, based on the information received. **Storytelling (career testimonials) and speaker diversity** is essential for inspiration and resolving misconceptions, conveying the message that bioeconomy is a broad, interdisciplinary field accessible to all. Finally, students need **concrete and practical information** on bioeconomy career pathways and infrastructure in the region for education and skills–building.

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# 8 Appendix 1: List of formats and format leaders

Table A.1: Formats, Key Performance Indicators / Target Groups and Format Leaders

| #T | Activities (formats) | Format Leader |
|---|---|---|
| **2.1a** | #8 "Hands-on labs" and playful activities in each country (KPI: #400 in total, #8 countries, #50 young people involved in each country, TARGET GROUPS: pre/early, teachers and multipliers) | FVA |
| **2.1b** | #4 "Bioeconomy village" at large scale events (KPI: #40,000 in total, #4 countries, #10,000 young people involved in each country, TARGET GROUPS: (1) pre/early, (2) elementary, (3) high school | PEDAL |
| **2.1c** | #4 **"**Inside the bioeconomy**"** experiential exhibitions (KPI: #4,000 in total, #4 countries, #1,000 young people involved in each country, TARGET GROUPS: (1) pre/early, (2) elementary, (3) high school, (4) multipliers | BTG |
| **2.1d** | #8 "BioArt Gallery" (in 8 languages) (KPI: #40,000 in total, #5,000 young people involved in each country, TARGET GROUPS: (1) elementary, (2) high school, (3) teachers, (4) multipliers | PEDAL |
| **2.2a** | #3 "Role-play game" on bioeconomy jobs in schools (KPI: #150 in total, #3 countries, #50 young people involved in each country, TARGET: (1) pre/early and (2) teachers) | AIJU |
| **2.2b** | #3 "TEDx pitches" (KPI: #240 in total, #3 countries, #80 young people involved in each country, TARGET GROUPS: (1) elementary, (2) high school, (3) multipliers | FVA |
| **2.2c** | #4 "Bioeconomy careers info days" (KPI: #300 in total, #4 countries, #75 teenagers involved in each country, TARGET GROUP: (1) high school | APRE |
| **2.2d** | #3 **"**A Day in a biorefinery" study visit (KPI: #100 in total, #3 countries, #34 teenagers involved in each country, TARGET GROUP: (1) high school | BTG |
| **2.2e** | #1 "Schools' projects" to grow future entrepreneurs (KPI: #5,000 in total, # 1 country, #5,000 teenagers involved in Italy, TARGET: (1) high school and (2) teachers) | FVA |
| **2.3a** | #24 Educational activity using the toolkits (KPI: #720 in total, #8 countries, #90 young people involved in each country, TARGET GROUPS: (1) pre/early, (2) elementary, (3) high school, (4) teachers | AIJU |
| **2.3b** | #8 "Bioeconomy talks/seminars" inquiry based learning (KPI: #400 in total, #8 countries, #50 young involved in each country, TARGET GROUPS: (1) high school, (2) teachers | BTG |
| **2.3c** | #1 "Online bio educational village" in English (KPI: #5,000 young people in total, TARGET GROUPS: (1) elementary, (2) high school, (3) teachers | BTG +FVA |
| **2.4a**<br>**2.4b**<br>**2.4c** | Educating teachers in teaching the bioeconomy<br>#1 "What's bioeconomy" MOOC<br>#3 "How to use GenB toolkits"<br>#1 "Bioeconomy job profiles" on factsheets explanation<br>TARGET GROUPS: (1) pre/early, (2) elementary, (3) high school, (4) teachers. KPI-1: #800 teachers, #8 countries, #100 teachers in each country. KPI-2: #12,000 young people, #1,500 in each country | EUN<br>EUN<br>EUN |
| **2.5a**<br><br>**2.5b** | #8 Informative webinar in partners' countries<br>#24 individual meetings with 3 multipliers in each country<br>TARGET GROUPS: (1) pre/early, (2) elementary, (3) high school, (4) multipliers. KPI-1: #80 multipliers, #8 countries, #10 multipliers in each country. KPI-2: #4,000 young people, #500 in each country | PEDAL |

# 9 Appendix 2: Distribution of activities (formats)

Table A2: Geographical distribution of activities (formats)

| #T | Activities | AT | EL | IT | NL | PT | SK | ES | Pan-EU |
|---|---|---|---|---|---|---|---|---|---|
| **2.1a** | #8 "Hands-on labs" and playful activities | ZSI | QPL/ HSPN | APRE/ **FVA** | BTG | LOBA | PEDAL | AIJU | EUN |
| **2.1b** | #4 "Bioeconomy village" at large scale events | - | HSPN | APRE/ FVA | - | LOBA | **PEDAL** | - | - |
| **2.1c** | #4 **"**Inside the bioeconomy" experim. exhibitions | - | - | - | **BTG** | LOBA | - | AIJU | EUN |
| **2.1d** | #8 "BioArtGallery" | ZSI | QPL/ HSPN | APRE/ FVA | BTG | LOBA | **PEDAL** | AIJU | EUN |
| **2.2a** | #3 "Role-play game" on bioeconomy jobs in schools | - | HSPN | - | - | - | - | **AIJU** | EUN |
| **2.2b** | #3 "TEDx pitches" | - | - | **FVA** | - | - | PEDAL | - | EUN |
| **2.2c** | #4 "Bioeconomy careers info days" | - | QPL | **APRE** | - | - | PEDAL | - | EUN |
| **2.2d** | #3 **"**A Day in a biorefinery" study visit | - | - | APRE | **BTG** | - | - | - | EUN |
| **2.2e** | #1 "Schools' projects" to grow future entrepreneurs | - | - | APRE/ **FVA** | - | - | - | - | - |
| **2.3a** | #24 Educational activity using the toolkits | ZSI | HSPN | APRE/ FVA | BTG | LOBA | PEDAL | **AIJU** | EUN |
| **2.3b** | #8 "Bioeconomy talks/ seminars" inquiry-based learning | ZSI | HSPN | APRE/ FVA | **BTG** | LOBA | PEDAL | AIJU | EUN |
| **2.3c** | #1 "Online bio educational village" | - | - | **FVA** | - | - | - | - | - |
| **2.4a** | Educating teachers in teaching the BE | | | | | | | | |
| **2.4b** | #1 "What's bioeconomy" MOOC | ZSI | HSPN | APRE/ | BTG | LOBA | PEDAL | AIJU | **EUN** |
| **2.4c** | #3 "How to use GenB toolkits" | ZSI | HSPN | FVA | BTG | LOBA | PEDAL | AIJU | **EUN** |
| | #1 "Bioeconomy job profiles" on factsheets explanation | ZSI | HSPN | (3X) | BTG | LOBA | PEDAL | AIJU | **EUN** |
| **2.5a** | #8 Inform. webinars | ZSI | QPL | APRE/ | BTG | LOBA | **PEDAL** | AIJU | EUN |
| **2.5b** | #24 individual meetings with 3 multipliers | ZSI | QPL | FVA (2X) | BTG | LOBA | **PEDAL** | AIJU | EUN |

**NB1:** EUN through calls will ask for support to the teachers of its pan-European network. **NB2:** Target countries of some activities (formats) may vary depending on emerging opportunities.

# 10 Appendix 3: Bioeconomy Changemakers Festival satellite events

Commentato [FF12]: Ma è utile tenerla?

The Bioeconomy Changemakers Festival is a festival of events that was organised by the European Commission (DG Research and Innovation) in cooperation with the Bioeconomy Youth Ambassadors. The festival aimed to engage youth as drivers of the transformative change needed to address the multiple challenges that Europe faces today, and to unlock the potential of the bioeconomy to make the transformation happen.

Centre piece of the festival was the high-level event ''Next generation bioeconomy policies – Achieving the green and fair transition through competitive sustainability'' that was organised in Brussels on 13 March 2024. The hybrid event gave voice to youth and changemakers on how to move towards a sustainable and circular bioeconomy.

Beyond the central element, close to 30 satellite events were organised in countries across the EU. Powered by the GenB project, consortium partners PEDAL, Q-PLAN, FVA/APRE and LOBA organised such national events in Slovakia, Greece, Italy, and Portugal respectively. The scope of their satellite events is summarised in the table below. Detailed reports on the satellite events are available at the GenB project website, as follows:

- Nitra edition: here
- Thessaloniki edition: here
- Rome edition: here
- Aveiro edition: here

| Venue | (co-)organiser | Scope |
|---|---|---|
| Nitra, Slovakia | PEDAL | |
| Thessaloniki, Greece | Q-PLAN International | Bioeconomy careers Info Day; Open policy workshop |
| Rome, Italy | FVA/APRE | Inspire, inform, educate, and engage younger generations and Italian GenB Ambassadors through TEDx pitches, bioeconomy careers info day, Bioeconomy Village, BioArt Gallery and immersive educational gamified experiences such as the Escape Game and bioeconomy quizzes. |
| Portugal | LOBA | Bioeconomy careers info day, Bioeconomy Village, BioArt Gallery |


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