

D4.1

Impact monitoring and assessment strategy

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Abstract	The aim of this deliverable is to outline the monitoring strategy proposed to control the accomplishment of the project's KPIs by both work package/task leaders and involve partners. For this purpose, a self-check, collaborative table has been elaborated, where all partners can easily access to the information about the KPIs they are involved in, and which effort is required to achieve them. Additionally, to assess the effectiveness of the project's outcomes, quantitative and qualitative designs are proposed to collect data from target groups of the project's activities. To finish with, several SSH indicators are considered to analyse the expected impact of the project's outcomes in three fields: scientific, societal and economic.
Keywords	Monitoring, Assessment, KPI, GenB



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The information and views set out in this report are those of the author(s) and do not necessarily reflect the official opinion of the European Union. Neither the European Union institutions and bodies nor any person acting on their behalf.

Table of Abbreviations and Acronyms

Abbreviation	Meaning
KPI	Key Performance Indicator
WP	Work Package
MOOC	Massive Open Online Course
SSH	Social Sciences and Humanities
PhD	Philosophie Doctor
KIP	Key Impact Pathways
HE	Horizon Europe
ICBSD	International Conference on Bioeconomy and Sustainable Development
INTED	International Conference of Education, Research and Innovation
EU	European Union
GDP	Gross Domestic Product
KER	Key Exploitable Results

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1 Executive Summary

The objective of this deliverable is to describe the impact monitoring and assessment strategy of the GenB project activities and outcomes. The objective of this strategy is threefold. First, to create an easy and accessible resource that can be shared by responsible partners and task/work package leaders and contains updated information about the milestones. Second, to consolidate reliable indicators to verify the quality and effectiveness of the GenB project initiatives in achieving the desired objectives regarding the dissemination of bioeconomy knowledge. Third, to establish the guidelines that ensure the dissemination of the project's results and its application in three impact categories: scientific, societal, and economic.

As a result, this deliverable shows in detail which are the resources and lines of action to perform the assessment and monitoring strategy. First, the principles of the GenB project are outlined, specifying which is the specific purpose of this deliverable, within its respective task and work package. Then, related to the monitoring of the fulfilment of objectives, a global self-check table is presented, highlighting the advantage of being shared and edited by all members of the consortium, and serving as a way to distribute the workload among all project members participating in each task. Two elements are considered to ensure the accomplishment of objectives: the Key Performance Indicators (KPIs) expressed in a quantitative way, and the deadlines as agreed in the project.

To continue with, the achievement of the expected impact is considered from the point of view of the target audience in the project's activities. Two variables of interest are mainly considered: target groups' understanding of the concepts included in the training activity and satisfaction of the target audience. This is due to the importance of these factors in ensuring the proper achievement of the actions that form the GenB methodology, and at the same time creating an exciting and valuable experience for users and making sure this value is perceived by them. Nevertheless, other relevant variables are proposed to be measured globally, and not just activity by activity, at the end of the project.

Finally, in line with the Key Impact Pathways proposed by the Horizon Europe program, the potential of the project's outcomes in contributing to three main dimensions is anticipated: scientific, societal and economic impact. Proposed indicators are adapted to the context of the project in three different time frames: short-, medium- and long-term.

2 Introduction

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 (Transition2Bio, BIObec, AllThings.Biopro, WaysTUP!, BIOSWITCH, BLOOM, BIOVOICES, BIOWAYS, LIFT, Biobridges, BioCannDo, EuBioNet), European and International school networks and experts in socio-economic science and humanities.

GenB overall objective is to make the Generation Bioeconomy (GenB), aware, sensitive and interested on environmental issues, sustainability and circularity. GenB will: 1) Co-create innovative approaches in cooperation with young people, parents, teachers and other formal and non-formal education professionals, to provide formats, materials and toolkits on the bioeconomy and bio-based sectors, through social innovation (Common Ground Camp, Focus Groups and Living Labs); 2) Inspire & Inform young people, raising their awareness on sustainable and circular bioeconomy and bio-based sectors, including the promotion of bioeconomy careers; Educate young people to accelerate the transition towards a more sustainable and circular behaviours and lifestyles, teachers in teaching environmental issues and other multipliers to promote the bioeconomy to their target audiences; 3) Engage and Empower Bioeconomy Youth Ambassadors (GenB Ambassadors), the frontrunners in driving the change by attracting and influencing other young people; support them to Take a role creating opportunities to make their 'voices' heard and assume their role in the transition. 4) To maximise its impacts and ensure exploitation, replicability, and sustainability, GenB will: widely communicate and engage the society, create synergies with other projects and initiatives, consolidate the GenB educational model, and produce policy recommendations targeting Ministries of Education and other policy makers.

In particular, Task 4.1 (framed in Work Package – WP4: Impact assessment and policy recommendations) is devoted to configuring a sound impact monitoring and assessment strategy. Reliable impact indicators such as SSH indicators are to be included, to monitor and assess the impact of the proposed GenB materials and activities for each of the six interconnected actions of the GenB methodology (Co-create, Inspire & Inform, Educate, Engage, Empower and Take a role). The strategy also provides advice and guidance for fine-tuning, improvements, or corrective actions.

The objective of this deliverable is to outline the impact monitoring and assessment strategy of the GenB project activities and outcomes. More specifically, this deliverable intends to:

- Present and describe the tool(s) prepared to monitor and acknowledge the achievement of the KPIs established, for the different work packages and tasks, in the project proposal.
- Define the strategy proposal to be followed in order to
 1. Find out the levels of understanding and satisfaction, derived in the target groups, of the proposed activities in the project (workshops, social media campaigns, Massive Open Online Courses (MOOCs), etc.).

2. Define additional KPIs or reliable impact indicators to verify the effectiveness of the GenB project activities in fostering each of the six interconnected actions of the GenB methodology (Co-create, Inspire & inform, Educate, Engage, Empower and Take a role) in global terms, taking as a reference the Specific Objectives (SO) of the project.
3. Establish future KPIs that can be of use to evaluate the impact in the short-, medium- and long-term of the project's actions. These KPIs will be grouped in three dimensions according to their field of action.

3 Monitoring of the fulfilment of objectives

The first part of the impact monitoring and assessment strategy has to do with the control of the impact indicators to be achieved in order to accomplish the expected impact at a European level. In order to ensure the fulfilment of the SOs and the KPIs in the project, the following resources are proposed:

3.1 Self-check global table

The first resource is an online table, to be shared with all the partners in the project, where the tasks and expected results assigned to them can be verified, and the progress monitored. The table is presented in an .xls (Excel) format, so that it can be easily accessed, shared and edited online.

The idea is that all members can have an easy access to the expected results for the tasks they are responsible for, and autonomously add their progress with a triple purpose:

- The task leaders and WP leaders can allocate responsibilities to the partners involved in each task, and partners can directly access this information.
- The task leaders and WP leaders can have an immediate, up-to-date control of the tasks they manage.
- Partners involved in the task can know whether they achieved their objective, or if they need an additional effort in some activity.

The elaboration process of the self-check global table is detailed in Figure 1. First, an initial version including all KPIs drawn from the grant agreement divided by WP and task, and the proposed monitoring variables, is created. Second, the draft version is shared with the WP leader and the project coordinator, who could provide feedback and suggestions to enhance the tool. Third, the final version is set up based on these comments and eventually shared for its management and use to the different partners involved.

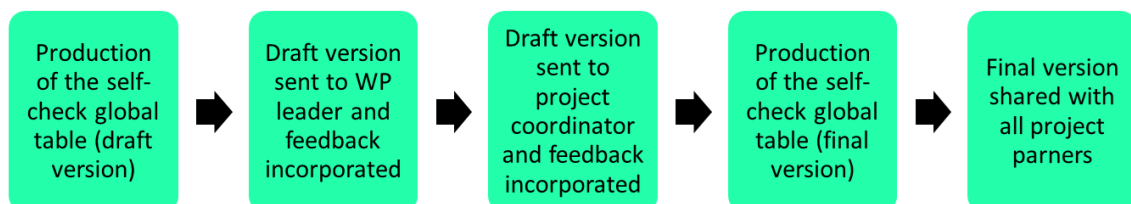


Figure 1: Elaboration process of the self-check global table

The structure of the self-check global table, as illustrated in figures 2 and 3, works as follows:

1st column: name and number of the task, as defined in the respective WP. For a clearer organisation of the information, tasks are divided and grouped in WPs.

2nd column: the target group(s) that the activity is aimed for, identified by an icon. The icons are the same that had been proposed in Section 1.2.7. of the project proposal and can be checked in Table 1.








Young people		Multipliers	
 Pre- and early-school (4-8 y.o.)	 Teachers (formal education professionals targeting all ages students)	 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.	
 Elementary school (9-13 y.o.)			
 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: Target groups of the GenB project activities

3rd column: the expected results linked to the specific task, and divided in terms of the partners involved. If, for instance, there are three partners involved in the expected outcome of a task, then the expected result is divided in three subsections, one for each partner, and each of them contains the amount of work allocated to that partner. For this objective, task and WP leaders should supervise the table in first instance and make sure the distribution of tasks is correct. This allows a transparent and clear allocation criterion for the workload of each partner, based on the instructions of the task leader and the WP leader.


Task	Target	Expected Results
WP1. Co-creation of innovative approaches		
1.1 Education contents		>100 contents from at least >50 sources in several languages
		>10 contents from at least >5 sources in several languages
		>10 contents from at least >5 sources in several languages
		>10 contents from at least >5 sources in several languages
		>10 contents from at least >5 sources in several languages
		>10 contents from at least >5 sources in several languages
		>10 contents from at least >5 sources in several languages
		>10 contents from at least >5 sources in several languages
		>10 contents from at least >5 sources in several languages
		>10 contents from at least >5 sources in several languages

Figure 2: Representation of task, target group and expected results in the self-check global table

4th column: the KPI, expressed in number format. The operationalisation of the objectives requires a measurable, verifiable, realistic and achievable statement; hence, they are expressed as a numerical figure (KPIs) to be achieved in the given time frame.

Sometimes, an expected result is divided into several KPIs, to guarantee a fair and clear allocation of responsibilities.

5th column: the target group(s). Based on the information in the grant agreement, it is stated which group should be targeted and selected for data retrieving or sending of communication and/or training activities.

6th column: the target country(ies). The abbreviation for the countries where the information should be gathered or disseminated is included, to correctly delimit which is the outreach of each partner

KPI	Target groups	Target Countries
5.000	users	9 languages
500	users	IT
500	users	NL
500	users	PT
500	users	SK
500	users	BE
500	users	AT
500	users	ES
500	users	IT
500	users	EL
500	users	EL

Figure 3: Representation of KPIs, target group and target country in the self-check global table

7th column: number of target groups reached. Depending on the task, the outcomes can be people, views to a video or an amount of documents to be generated, among others. This column should be filled in by the group responsible for that particular KPI. In that way, the column “is the KPI achieved?” will automatically change and display whether there are enough units of the target group reached, or if an additional effort is required.

8th column: “Is the KPI achieved?”. Directly linked to the number of respondents and KPI columns, it automatically reflects whether the KPI is accomplished or not. This is a useful indicator for both, partners involved in a task and leaders supervising the progress of the task or the work package in global terms.

9th column: responsible partner. The partner for each particular (division of) KPI can be easily identified. The results can also be filtered by partner, so that each partner knows exactly which are the tasks under its responsibility. The abbreviated name for each partner is used.

Number of target groups reached	Is the KPI achieved?	Responsible partner (short name)
0	NO	HSPN
	NO	APRE
	NO	BTG
	NO	LOBA
	NO	PEDAL
	NO	EUN
	NO	ZSI
	NO	AIJU
	NO	Q-PLAN
	NO	FVA
	NO	HSPN

Figure 4: Representation of number of target groups reached, achievement of KPI and responsible partner in the self-check global table

10th column: deadline. Based on the chronogram of the project, the date where that task is due is included.

11th column: achievement date. Partners should also reflect when the KPI was achieved, for management and justification purposes. Also, partners can write their current date to individually know whether they still have margin to finish achieving the KPI.

12th column: “deadline accomplished”. Similar to the 8th column, it automatically compares the deadline and achievement dates and informs whether the KPI has been reached on time or not.

Deadline	Achievement date	Deadline accomplished
30/04/2024	01/05/2024	NO
30/04/2024	28/04/2024	YES
30/04/2024	01/05/2024	NO
30/04/2024	01/05/2024	NO
30/04/2024	01/05/2024	NO
30/04/2024	01/05/2024	NO
30/04/2024	01/05/2024	NO
30/04/2024	01/05/2024	NO
30/04/2024	01/05/2024	NO
30/04/2024	01/05/2024	NO
30/04/2024	01/05/2024	NO

Figure 5: Representation of deadline, achievement date and accomplishment of deadline in the self-check global table

4 Achievement of the expected impact

In this second section of impact assessment, there are series of measurement scales to make sure that the educational objectives of each of the tasks and linked activities have been accomplished. When designing and selecting measurement items, a norm was proposed to ensure that the dimensions related to co-create, inspire & inform, educate, engage and empower, and take a role, have been aligned with the proposed KPIs and achieved through their consecution. In this way, it will be ensured that appropriate Social Sciences and Humanities (SSH) have been considered when evaluating the performance of the activities.

Two main dimensions were highlighted as core in all the activities: understanding and satisfaction. Both were considered key elements to find out how effective each activity was in 1) transmitting ideas and notions about bioeconomy, following an informative approach, to the target groups, and 2) creating an enjoyable environment, where the acquisition of knowledge is perceived as useful by the target audience.

In order to take into account the perspectives of different interest groups and obtain data of a varied nature that allow in-depth knowledge of the impressions of all the agents involved in the project, a hybrid methodology will be used with respect to data collection techniques and target groups. On the one hand, different tools will be combined, such as online questionnaires, interviews and direct observation techniques. On the other hand, information will be obtained from different groups, highlighting the members of the target groups that participate in the project activities and the consortium partners that are in immediate contact during the training activities.

Part of the data will be gathered from the experience in part of the project's activities. Different formats and timeframes are considered for data retrieval, given that the target audience will not always be reachable for a personal online survey. Proposed alternatives are printed surveys to be filled in directly in-person where the focal activity takes place, or online platforms for live questionnaires such as Kahoot or Quizizz. Anyhow, data will try to be collected in the shortest possible time after the focal activities have been carried out. The contents of the potential survey are explained in this section and outlined as an Appendix of the document. It will be a short format questionnaire, with around 20 items to be answered referred to the last activity the target audience was involved in. An additional final satisfaction questionnaire is expected to be distributed to evaluate the whole experience in the project once the deadline approaches.

Based on whether the same members of the target audience participate in various activities of the project or not, we provide different options for participants to provide their perceptions and attitudes towards their effectiveness:

- **Working with a group in the long that is involved along several activities of the project:** a periodic survey will be designed to be handed in every six months, with the same items about general understanding of bioeconomy-related concepts and satisfaction with the proposed activities. This format would be suitable to obtain time evolution perceptions of these concepts and perform longitudinal analysis to verify the effects along the

project, and how the knowledge about bioeconomy and satisfaction with the proposed activities is boosted. In such case, data collection can combine different methods.

- **Working with different groups along the activities:** ad-hoc surveys will be distributed within particular activities (during or after them). To isolate the effects of the activity on target audience' perceptions, the survey will directly refer to the contents of the activity or the modality of the activity itself.

In particular activities where there is an important component of qualitative data to be assessed, beyond the inclusion of open questions in the surveys that capture unbiased and comprehensive insights about the target audience' experience, the undertaking of semi-structured interviews with a limited and selected number of members of the target audience is conducted, especially when the activities allow so because of the in person/active involvement and the longer duration of the activities. The questions in the interviews will be aimed to identify how the aspects of understanding, satisfaction, and other relevant indicators are addressed through the different activities, and which aspects can be improved in order to maximise the accomplishment of the GenB educational model purposes.

4.1 Understanding of bioeconomy-related concepts

To derive a proper measurement of the understanding of bioeconomy and its derived dimensions because of the project's activities, three educational models have been contrasted. An explanation of each of the taxonomies is developed, followed by an integration of the three different views and the presentation of measurement scales to gather data about understanding of bioeconomy-related concepts.

1. Bloom's Taxonomy

The Revised Bloom Taxonomy (Forehand, 2005) is used as a basis to evaluate this aspect. After more than 60 years, this classification is currently applied when defining most of the learning curricula in public schools and other educational institutions in Europe, including both contents and activities.

Bloom taxonomy was proposed by the PhD in Education Benjamin Bloom, in 1956. The original proposal consisted of six cognitive levels of complexity, depicted hierarchically, that are faced during learning. In this way, teachers encourage their students to "climb up the ladder" and achieve higher levels of knowledge. Likewise, if the student has reached the level of application, this means that s/he has also mastered the knowledge and comprehension of a particular concept. In the original taxonomy, the lowest three levels are: knowledge, comprehension, and application. The upper levels are: analysis, synthesis, and evaluation.

The revised Bloom's taxonomy (Anderson & Krathwohl, 2001) was published, where the six-dimension classification was kept, but all dimensions were renamed. The new terms are defined as:

- **Remembering:** Retrieving, recognizing, and recalling relevant knowledge from long-term memory.

- **Understanding:** Constructing meaning from oral, written, and graphic messages through interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining.
- **Applying:** Carrying out or using a procedure through executing or implementing.
- **Analysing:** Breaking material into constituent parts, determining how the parts relate to one another and to an overall structure or purpose through differentiating, organizing, and attributing.
- **Evaluating:** Making judgments based on criteria and standards through checking and critiquing.
- **Creating:** Putting elements together to form a coherent or functional whole; reorganizing elements into a new pattern or structure through generating, planning, or producing.

These six dimensions are graphically represented in Figure 6.

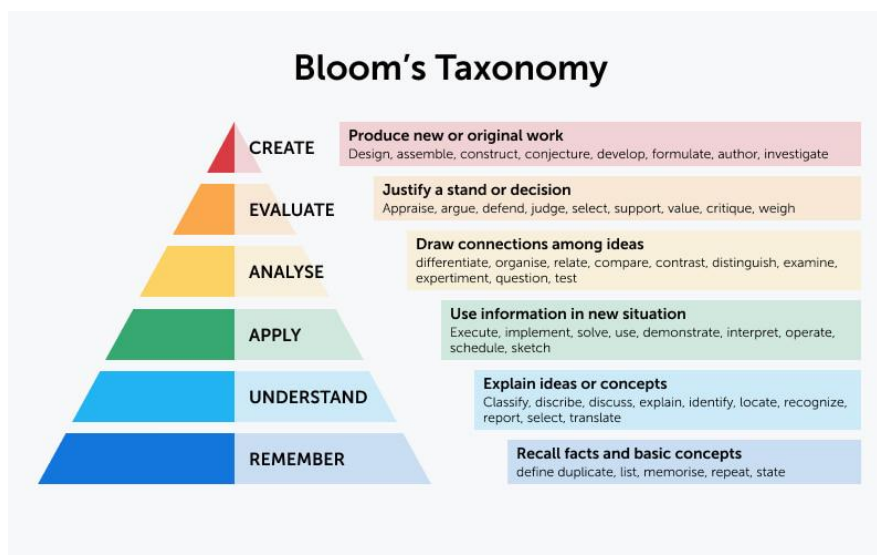


Figure 6: Graphical representation of Bloom Taxonomy's dimensions.

Source: Valamis (2022)

2. Fink's Taxonomy of Significant Learning

Two extra educational frameworks are used to complement this view on learning and assimilation of concepts: Fink's taxonomy of significant learning and SOLO Taxonomy.

Significant learning refers to long-lasting and solid learning, because it emerges through the interconnection of new learning with previous knowledge that the student already had, in such a way that relationships are produced to reorganise knowledge, making a solid learning structure possible.

To this end, Fink (2003) proposes a taxonomy based on 6 dimensions that are not understood as hierarchical (as in the case of Bloom's taxonomy) but that interact and interrelate to favour meaningful learning.

These 6 dimensions (presented in Figure 7) are:

- **Foundational Knowledge:** recall and understanding of information and ideas about a topic. This is a basic level of learning, from which more complex operations can be built upon.
- **Application:** practical use of the information and knowledge learnt. It involves the development of skills and abilities based on different ways of thinking:
 - Practical thinking: decision making and problem solving.
 - Critical thinking: discuss critical situations and take decisions.
 - Creative thinking: generate new ideas and perspectives.
- **Integration:** establish and connect ideas, perspectives, actions, etc. in human life situations.
- **Human Dimensions:** knowledge about the human dimension, either learning about oneself (personal dimension) or about others (social dimension).
- **Caring:** developing new feelings, interests, and values related to care. It includes caring in new ways or caring in new ways.
- **Learning to Learn:** refers to the development of skills and abilities that support lifelong learning and autonomous learning.

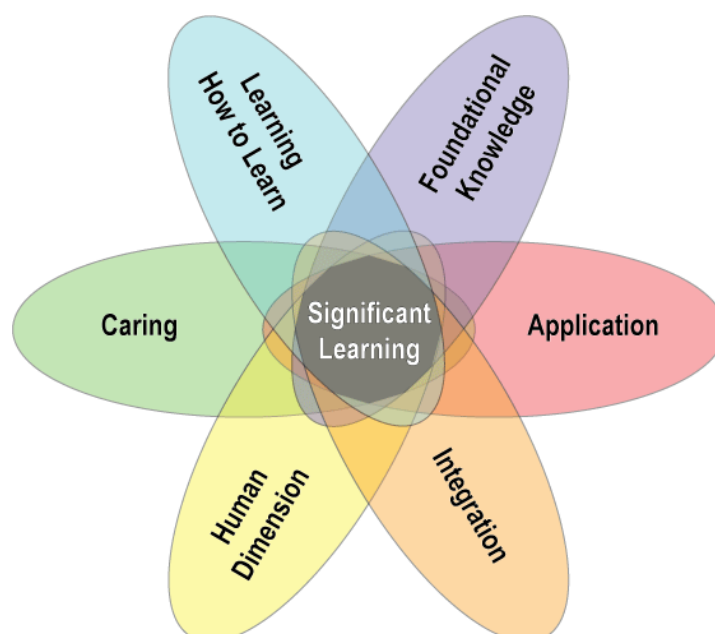


Figure 7. Graphical representation of Fink's taxonomy dimensions

Source: Addison & Tollefson (2022)

3. SOLO Taxonomy

The SOLO Taxonomy (Structure of Observed Learning Outcomes) is a hierarchical taxonomy by Biggs & Collis (1982) based on 5 different stages:

- Pre-structural level: at this level learners have only unconnected ideas about the topic, with no relation or connection between them. Therefore, they are not yet able to understand the information.
- Unistructural level: learners know and understand the basic information about the concept. Then they are able to begin creating simple connections but do not yet understand the complexity and depth of the topic.
- Multistructural level: learners know several relevant aspects of the topic, but independently. In some cases, they begin to establish relationships between these aspects, but are not yet able to establish the overall relationship between all of them.
- Relational level: learners know the aspects and concepts of the topic independently and is able to organise them to form and establish a structure. The learner understands the role that each aspect plays in relation to the whole and is able to form coherent and solid knowledge of the subject.
- Extended Abstract level: learners are not only able to establish relationships between different concepts, but to transcend the subject matter and connect with other subjects and domains. In this way, learning can be generalised and extrapolated to other subjects and areas.

Even though this taxonomy follows a hierarchical structure like Bloom's Taxonomy, rather than holistic such as in Fink's, this particular taxonomy focuses on learning, whereas Bloom's taxonomy deals with acquisition of knowledge.

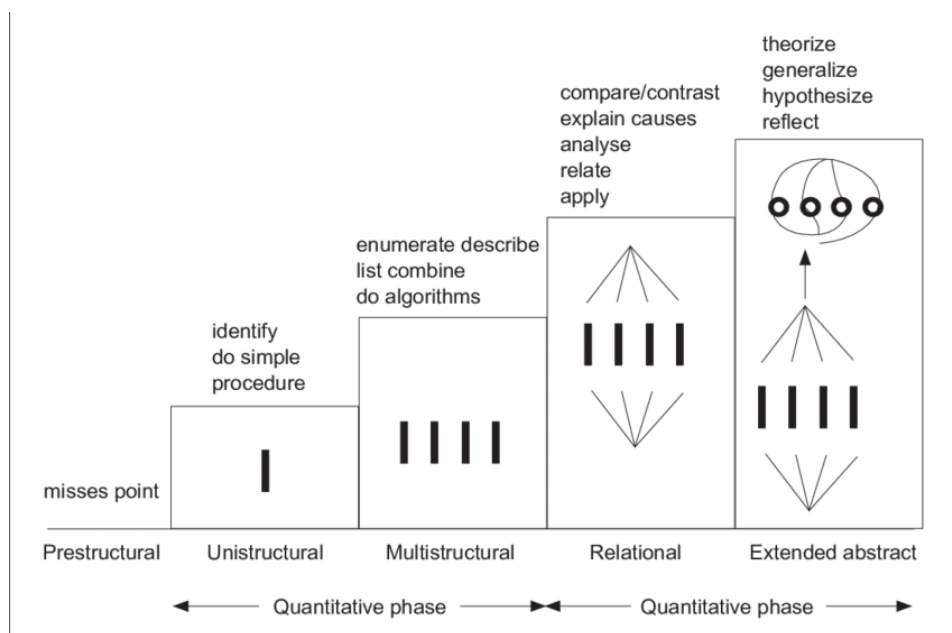


Figure 8. Graphical representation of SOLO's taxonomy dimensions

Source: Rembach & Dison (2016)

Based on Bloom Taxonomy, understanding would be considered as a lower-level thinking dimension, and the next step after recalling the concept. This would be considered as the primary step to acknowledge that the concept has been integrated by the participant, and hence the basic aim has been accomplished. This dimension correspond to the foundational knowledge coined by Fink, and is also identifiable with the unstructural language that is presented in SOLO. In all cases, it refers to the minimum necessary knowledge to understand the concept and build subsequent ideas upon it. The 4-item scale (Nkhoma et al., 2017) is proposed, based on one of the milestones proposed by Bloom's taxonomy, where knowledge improvement is measured. The items are as follows:

- The activity increases my knowledge (about bioeconomy)
- I catch the basic ideas of the knowledge taught (about bioeconomy)
- I try to apply the knowledge learned (about bioeconomy) in the activity
- The activity motivates me to integrate the knowledge taught (about bioeconomy)

The items will be measured with a 5-point Likert scale (*totally disagree* to *totally agree*).

4.2 Satisfaction with GenB activities

Students, or any individual taking part in a particular activity, are always more aware of their rights and generate expected outcomes when being part of an educational program. Previous reports issued by the European Union already point out the need to embrace change and to remain competitive in the current educational world (Herdlein & Zurner, 2015), where there is a wider, more diversified, and constantly dynamic combination of institutions and teaching methodologies.

In order to measure participants' satisfaction with the activity and based on the scale by Badau & Badau (2018) adapted to this research context, three items are included in the questionnaire related to each educational activity in which participants have taken part in. The items are as follows:

- How do you appreciate the attractiveness of this activity (i.e. if it was fun, entertaining, etc.)?
- How do you rate your recommendation of the activity for different age categories?
- How do you rate your satisfaction in this activity?

The items will be measured with a 5-point Likert scale (*very low to very high*).

4.3 Other perceptions and outcomes

Other relevant questions are related to the fulfilment of the different SOs, from the point of view of the participants involved in GenB activities. As these additional questions refer to the overall participation in the GenB experience, these items will be considered for a final survey once the project comes to an end and will refer to the totality of experiences within the GenB activities.

Suggestions for these additional variables to be included are illustrated below:

SO1. Provide **educational and informational toolkits on bioeconomy** in general and bio-based sectors.

- The toolkits use innovative approaches, formats, materials and tools that... (engage the students, allow them to learn easily and having fun, include practical application of the theoretical content).
- The toolkits include a variety of materials and tasks (graphical and interactive content, activities that involve discussion and critical thinking).
- The toolkits were designed targeted to different demographic and professional groups (children, parents, teachers, other formal and non-formal professional educators).
- The toolkits are available for different interest groups: young people, teachers...

SO2. Raise **awareness, interest and knowledge** of young people at **pre-school, elementary and high school** on the **environmental, social and economic benefits of sustainable and circular bioeconomy** and its sectors.

- The activities have increased students' awareness about sustainable and circular bioeconomy
- The activities have raised students' interest about sustainable and circular bioeconomy
- The activities have increased students' knowledge about sustainable and circular bioeconomy
- The activities consider what young people like or are interested in

SO3. Increase **interest** among new generations to **join education and training on bioeconomy** at large and **create new ways of attracting talent in the life science, technology and the bioeconomy** opportunities.

- The activities cover the different aspects of bioeconomy
- The activities allow to know which are the professional opportunities linked to the bioeconomy sectors
- The activities show which are the requirements (soft and hard skills) for professional opportunities linked to bioeconomy
- The activities allow to master the requirements (soft and hard skills) for professional opportunities linked to bioeconomy
- The activities are engaging and attract future talents to bioeconomy academic and professional positions

SO4. Contribute to the transition of the **new generations** towards **more sustainable and circular behaviours, consumptions and lifestyles** through the **empowerment** of the young generations **to assume their role.**

- The activities clarify which actions and behaviours are in line with sustainability and circular economy principles
- The activities clarify which products and consumption patterns are in line with sustainability and circular economy principles
- The activities exemplify which lifestyles are in line with sustainability and circular economy principles
- The activities encourage children and teenagers to take responsibility on sustainability and circular economy
- The activities make sure that the students know the impact of their daily/long-term actions on sustainability and circular economy

SO5. Maximise the project's impacts towards **behavioural and socio-economic changes** by sparking multipliers and GenB networks and ensuring **exploitation, replicability and sustainability of project's outcomes.**

- The activities teach/train educators on how to explain bioeconomy concepts.
- The activities are sufficiently promoted/communicated as to reach the targeted multipliers (different countries, social groups).
- The activities are accessible to different civil society groups.
- The activities will facilitate further communication and interaction between interest groups involved in the bioeconomy.

SO6. Contribute to the Destination 'Innovative governance, environmental observations and digital solutions in support of the Green Deal' by **supporting the public Administrations and schools** in the **implementation of initiatives promoting the green transition process.**

- The activities will promote the dissemination of results and knowledge of the Project in academic, professional and informational forums.
- The activities will foster policy making and dissemination of the results to national public administrations.

4.4 Data from partners

Perceptions and opinions from partners will also be considered, in order to complement the perspective of participants regarding the activities of the project. The contributions from all members involved in the project will be obtained through two main processes.

First, advice of other members of the project will be considered, even if they are not directly involved in that particular activity, to improve the design of the educational activities. For instance, when providing guidelines on how to carry out focus groups, the expertise of different members will be considered to obtain a more comprehensive and enhanced output.

Second, at the end of the project, an additional survey for partners in the project will be configured. The objective is to cover the same dimensions of interest for participants (i.e. understanding, satisfaction and others), but from the perspective of the partners, who are mostly in charge of performing the activities and accomplishing the objectives. Therefore, whether the proposed activities in the GenB project are perceived as consistent with the principles set in the grant agreement will be internally measured.

5 Key Impact Pathways

Beyond the consecution of KPIs and the achievement of the expected impact on the beneficiaries and groups of interest of the project, the GenB project intends to transmit the output of the project to policy makers and the wider public. This way, these stakeholders can gain further insights and take advantage of the results to incorporate bioeconomy and its benefits in the European and national regulatory and educational framework.

The Key Impact Pathways (KIP) proposed by the Horizon Europe (HE) are adapted to this particular research context and based on them, implications and recommendations will be developed at three different levels: scientific impact, societal impact and economic impact. Based on the feasibility of the results, and the contribution of this project, the most suitable KIP in each dimension is chosen and adapted to the context.

5.1 Scientific impact

One of the main pillars is the impact on the scientific community, and how the project's outputs can lead to knowledge making and advancement, to knowledge sharing, availability and accessibility, and open future lines and opportunities for research. Three different term goals are defined, based on the KIPs defined by Horizon Europe (see Figure 7).

- **Publications and academic results (short-term):** the results of the GenB project, based on innovative ideas and approaches, are expected to crystallize in contributions to academic conferences, book chapters and journals. In particular, specific forums related to the topics of bioeconomy and education are proposed as potential targets.
 - Academic journals:
 - Sustainable Development (Q2 in Scopus), Renewable Energy, Sustainability and the Environment
 - Social Marketing Quarterly (Q2 in Scopus), Marketing
 - Book chapters:
 - Palgrave Advances in Bioeconomy: Economics and Policies
 - Conferences:
 - 18TH International Conference on Bioeconomy and Sustainable Development (ICBSD 2024)
 - 18TH annual International Conference of Education, Research and Innovation (ICERI 2024)
- **Impact of the research outputs (medium-term):** the success of the diffusion of results in highly ranked journals and reputed conferences is expected to lead to knowledge diffusion, for instance through citations. In this sense, the contributions will be sent to forums and journals that fulfil some minimum quality requirements.
 - Double-blind peer review
 - Scientific committee (in the case of conferences)
 - Publication indexed in prestigious rankings (JCR, Scopus in the case of journals; SPI in the case of books; ISI in the case of conference proceedings)

The sharing of open-access research output through the projects' channels is also considered.

- **World-class science (long-term):** the academic outputs are expected to serve as the basis to enhance discussions and mutual learnings and to expand interest in the bioeconomy, also across disciplines and sectors, for instance producing classroom and training materials on the topic of bioeconomy. For this purpose, a series of teaching materials and best practices guide to encourage learning about bioeconomy and improve learning practices in this field are intended to be created.

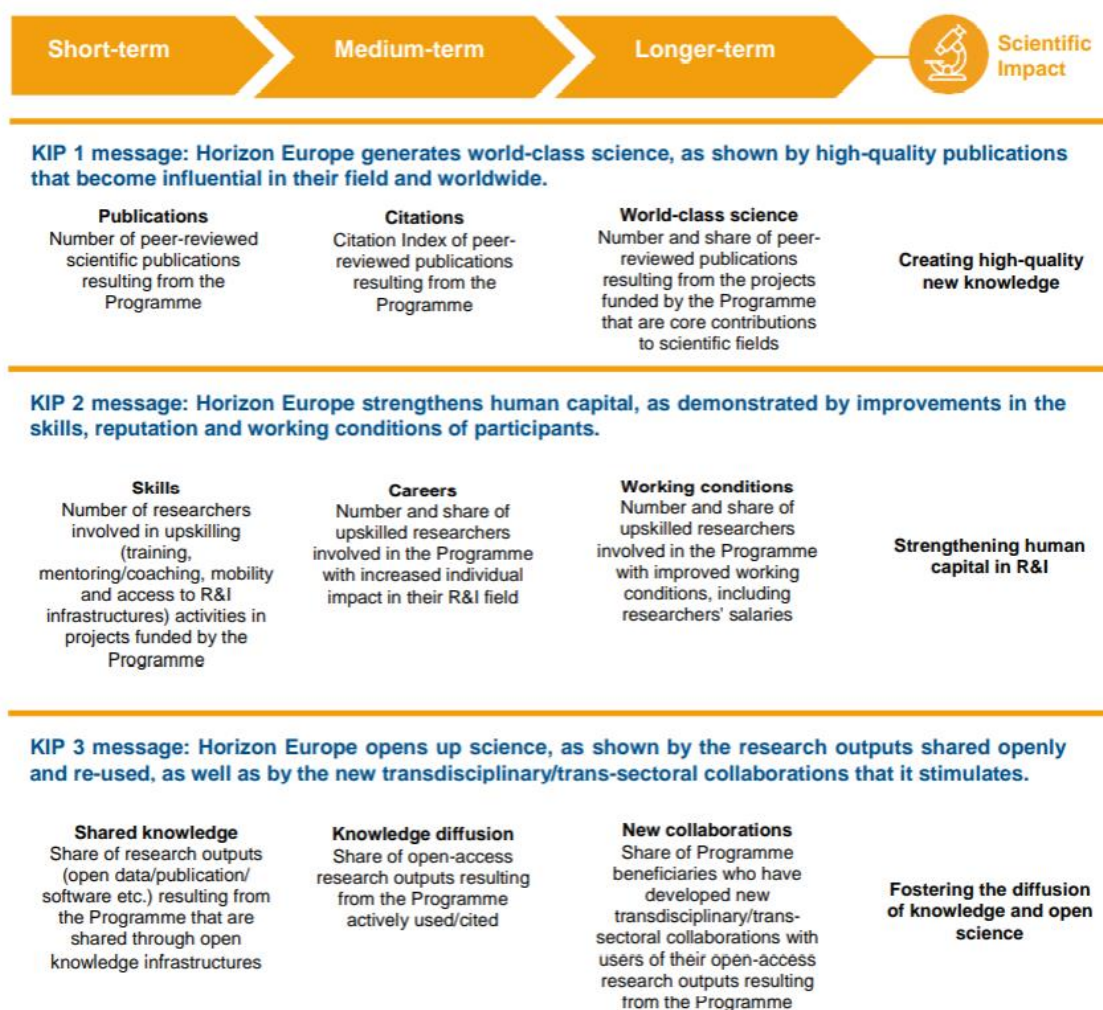


Figure 9: KIPs of scientific impact proposed by Horizon Europe

5.2 Societal impact

The second essential pillar of this project is related to its impact on different spheres of society. GenB seeks to promote behavioural and socioeconomic change thanks to training in terms of bioeconomy, which will ultimately result in a greater awareness of the importance of the

environment and the power of the new generations to lead the change towards sustainability and circularity in consumption. In particular, three different term goals are defined, based on the KIPs defined by Horizon Europe (see Figure 8).

- **Co-creation with citizens (short-term):** by accomplishing the KPIs and SOs of each task in the project, a large number of European Union (EU) citizens, especially youngsters, actively participating in the projects' activities are expected to be reached. Data and values for this indicator will be gathered based on the opportunities and methods provided by the projects' activities, that are expected to boost a change based on collaboration and social innovation.
- **Engagement (medium-term):** the engagement of European citizens within the processes and outcomes of this project is of high relevance. Mechanisms to facilitate citizen active engagement will be proposed, considering interest and relevance of the target group. The objective is to make an impact on future generations, and increase their awareness, sensitiveness and interest on environmental issues, sustainability and circularity of the process.
- **Societal R&I uptake (long-term):** specific actions will be proposed by which the scientific knowledge and innovations generated in this project can be of use in practical situations involving educational institutions, public administrations and/or organisations involved in the bioeconomy sector.



KIP 4 message: Horizon Europe helps to address Union’s policy priorities (including meeting the UN SDGs) through R&I, as shown by the portfolios of projects generating outputs that help to tackle global challenges.

Results	Solutions	Benefits	
Number and share of results aimed at addressing identified Union policy priorities and global challenges (including SDGs) (multidimensional: for each identified priority) Including: Nnumber and share of climate-relevant results aimed at delivering on the Union’s commitment under the Paris Agreement	Number and share of innovations and research outcomes addressing identified Union policy priorities and global challenges (including SDGs) (multidimensional: for each identified priority) Including: number and share of climate-relevant innovations and research outcomes delivering on Union’s commitment under the Paris Agreement	Aggregated estimated effects from use/exploitation of results funded by the Programme on tackling identified Union policy priorities and global challenges (including SDGs), including contributions to the policy and law-making cycle (such as norms and standards) (multidimensional: for each identified priority) Including: aggregated estimated effects from use/exploitation of climate-relevant results funded by the Programme to deliver on the Union’s commitment under the Paris Agreement, including contributions to the policy and law-making cycle (such as norms and standards)	Addressing Union policy priorities and global challenges through R&I

KIP 5 message: Horizon Europe produces knowledge and innovation that contribute to achieving missions of EU interest.

R&I mission results	R&I mission outcomes	R&I mission targets met	Delivering benefits and impact through R&I missions
Results in specific R&I missions (multidimensional: for each identified mission)	Outcomes in specific R&I missions (multidimensional: for each identified mission)	Targets achieved in specific R&I missions (multidimensional: for each identified mission)	

KIP 6 message: Horizon Europe creates value for European citizens, as shown by the engagement of citizens in its projects – and beyond the projects, through the improved uptake of scientific results and innovative solutions.

Co-creation	Engagement	Societal R&I uptake	Strengthening the uptake of R&I in society
Number and share of projects funded by the Programme where Union citizens and end-users contribute to the co-creation of R&I content	Number and share of participating legal entities which have citizen and end-user engagement mechanisms in place after the end of projects funded by the Programme	Uptake and outreach of co-created scientific results and innovative solutions generated under the	

Figure 10: KIPs of societal impact proposed by Horizon Europe

5.3 Economic impact

The results of the project are also expected to contribute to the European economic and technological advancement and to a fair and just transition. The scientific approach on which the whole project is based allows for specific innovations that generate economic outcomes. The specific innovations arising from the GenB project are expected to foster employment, competitiveness and higher GDP in the long-term and contributing to the economic transition by addressing environmental challenges, amongst improving other key macroeconomic indicators. In particular, three different term goals are defined, based on the KIPs defined by Horizon Europe (see Figure 9).

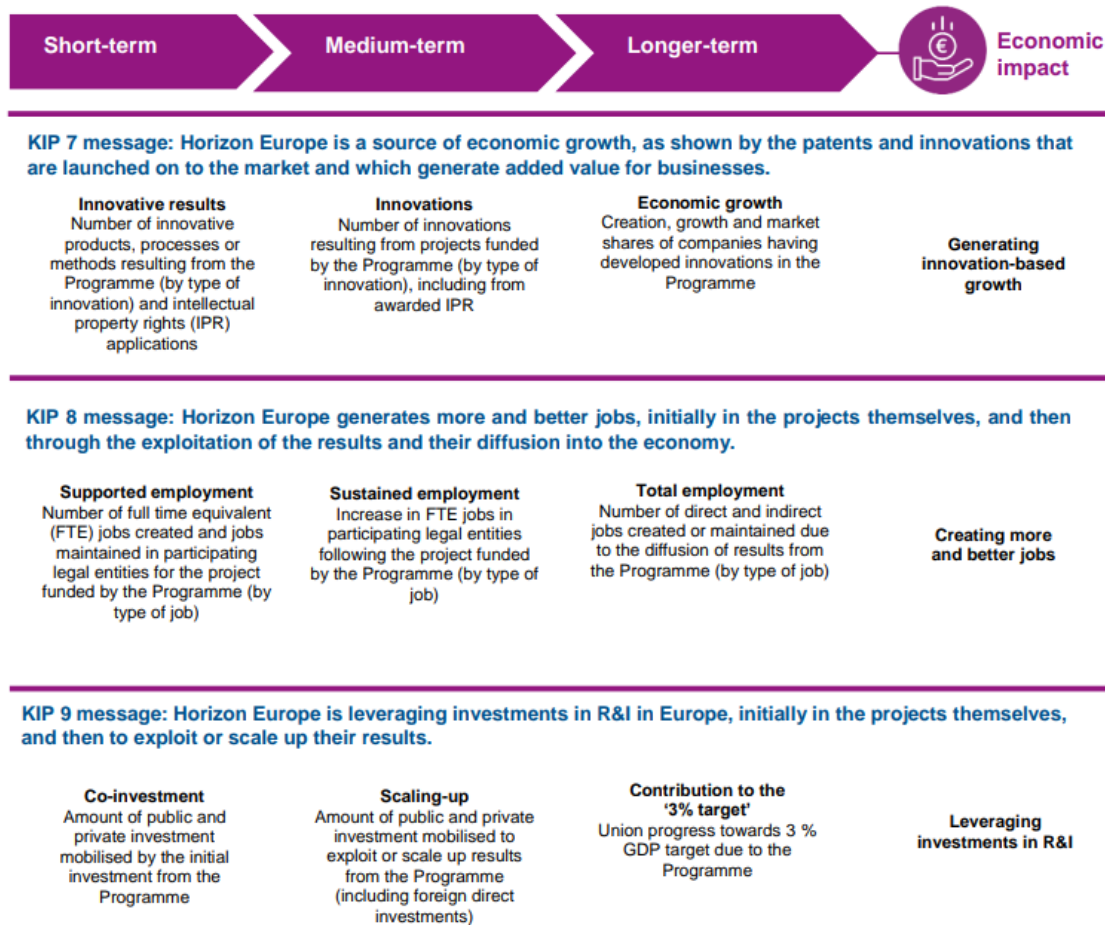


Figure 11: KIPs of economic impact proposed by Horizon Europe

- **Innovative results (short-term):** based on the methods used to raising awareness on bioeconomy and the involved economic sectors, and the education/training on key environmental issues, as well as and the initiatives to engage and empower GenB ambassadors, the key exploitable results (KERs) will be listed according to the development stage in which they are by making sense of its type, status of development, maturity phase and expected commercialisation date (if any) of the processes involved.
- **Innovations (medium-term):** the impact of these innovative results to generate future innovations. Namely, patents or other academic outputs, will be described.
- **Economic growth (long-term):** an overall estimation of the contribution of GenB results to elements of employment, competitiveness and higher GDP will be extracted, highlighting the opportunities to boost these macroeconomic indicators.

6 Conclusions

In this deliverable, the impact and monitoring assessment strategy to be implemented in the GenB project has been described. This has consisted of a presentation of the overall impact and monitoring assessment strategy, which is composed of three different aspects.

First, the monitoring of the fulfilment of the objectives was illustrated. For this purpose, an interactive table has been created with the aim of presenting the progress of the project's tasks, taking the KPIs of each task as a reference, together with the deadline of the task to be accomplished. These two elements are crucial for partners to find out whether they accomplished their duties, and supervisors/leaders to acknowledge such consecution. The format is developed to facilitate the classification of actions on tasks, involve partners and target outcomes. The content is divided in achievement of KPIs and organization of tasks between partners and time horizons.

Second, the impact assessment of the project has been presented, specifically focusing on participants' experience and point of view but also considering the insights from other partners in the project. The objective here is to provide reliable SSH indicators to acknowledge the effectiveness of the project in achieving the SOs following the GenB educational model. Therefore, indicators from academic literature will be used to measure each variable. Initially, we will focus on measuring widely applicable variables, namely participants' understanding and satisfaction in the related activities. However, other general indicators to be acknowledged at the end of the project will be also considered.

Third, the strategy laid out in this deliverable will assess the impact of the GenB project in the scientific, societal and economic domains. Several indicators have been proposed for each of the three dimensions in the short, medium and long term, and all these indicators consider the results and experiences of participants throughout the development of the project's activities.

Appendix 1

A figure with the whole table, considering all variables measured, is included. The current version of the self-check global table can be checked here: [self-check global table](#).

Task	Target	Expected Results	KPI	Target groups	Target Countries	Number of target groups reached	The KPI attributable partner (short ad)	Deadline	Achievement date after accomplishment	OBSERVATIONS	LESSONS LEARNED FRECO
WPI: Co-creation of innovative approaches											
1.1 Education contents	WPI	100 consultations at least - 10 projects at least	1000	users	EU	0	NO	HSPW	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	IT	0	NO	APPE	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	SK	0	NO	BTS	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	PT	0	NO	LIBA	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	GR	0	NO	PEDAL	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	EE	0	NO	EUN	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	AT	0	NO	ZSI	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	ES	0	NO	AAJ	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	IT	0	NO	APPE	30/04/2024	YES	
		10 consultations from at least 5 countries at least	500	users	IT	0	NO	GPLAN	30/04/2024	YES	
1.2 GenB resources Library	WPI	1000 users	1000	users	EU	0	NO	LIBA	30/04/2024	YES	
		#10 online Resou	1	users	PT	0	NO	LIBA	30/04/2024	YES	
		10 European Common Ground Camp	10	Participants	EU	0	NO	HSPW	30/04/2024	YES	
		#11 European Common Ground Camp	4	Participants	NL	0	NO	BTS	30/04/2024	YES	
		#12 European Common Ground Camp	4	Participants	PT	0	NO	LIBA	30/04/2024	YES	
		#13 European Common Ground Camp	4	Participants	SK	0	NO	PEDAL	30/04/2024	YES	
		#14 European Common Ground Camp	4	Participants	EE	0	NO	EUN	30/04/2024	YES	
		#15 European Common Ground Camp	4	Participants	AT	0	NO	ZSI	30/04/2024	YES	
		#16 European Common Ground Camp	4	Participants	ES	0	NO	AAJ	30/04/2024	YES	
		#17 European Common Ground Camp	4	Participants	IT	0	NO	APPE	30/04/2024	YES	
1.3 Cocreation of innovative approaches	WPI	100 European Common Ground Camp	100	Participants	EU	0	NO	HSPW	30/04/2024	YES	
		#18 Focus group	30	Young people	ES, EL, GR	0	NO	AAJ	30/04/2024	YES	
		#19 Focus group	30	Young people	ES	0	NO	AAJ	30/04/2024	YES	
		#20 Focus group	30	Young people	EL	0	NO	GPLAN	30/04/2024	YES	
		#21 Focus group	30	Young people	EL	0	NO	HSPW	30/04/2024	YES	
		#22 Focus group	30	Young people	GR	0	NO	EUN	30/04/2024	YES	
		#23 Focus group	30	Young people	EE	0	NO	ZSI	30/04/2024	YES	
		#24 Living Lab (12 ages: 3 countries) total 12 workshops	12	Participants	AT, DE, SK	0	NO	ZSI	30/04/2024	YES	
		#25 Living Lab (12 ages: 3 countries) total 12 workshops	12	Participants	AT	0	NO	ZSI	30/04/2024	YES	
		#26 Living Lab (12 ages: 3 countries) total 12 workshops	12	Participants	IT	0	NO	APPE	30/04/2024	YES	

Figure 12: Self-check global table

Appendix 2

An outline of the contents/topics covered in the survey instrument and interview to members of the target group is included here.

Contents of the survey:

- Understanding of bioeconomy-related concepts
- Satisfaction with GenB activities
- Awareness interest and knowledge about bioeconomy
- Fostering interest in and developing skills for bioeconomy-related job opportunities
- Motivating to take a role and adopting a sustainable and circular behaviours, consumptions and lifestyles.
- Facilitating exploitation, replicability, and sustainability of project's outcomes
- Assisting public Administrations and schools in the implementation of initiatives promoting bioeconomy

Contents of the interview:

- Previous knowledge about bioeconomy and related concepts
- Attitude towards sustainability/circularity
- Aspects and motivations for content understanding
- Satisfaction with the width/depth of the activity's content
- Satisfaction with the educational methodology of the activity
- Reasons for participating
- Interest in continuing their learning in bioeconomy
- Interest in joining similar activities in the future
- Suggestions for improvements

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