

Deliverable 3.2

Report on ROBIN Toolbox validation and update

S2I
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DEPLOYING CIRCULAR BIOECONOMIES AT
REGIONAL LEVEL WITH A TERRITORIAL APPROACH

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ABBREVIATIONS

ACBS	Andalusian Circular Bioeconomy Strategy
BAWÜ	Baden-Württemberg
CBGMC	Circular Bioeconomy Governance Model Canvas
CCRI	Circular Cities and Regions Initiative
EC	European Commission
EPPT	Environmental Protection Planning Tool
EU	European Union
KP	Knowledge Platform
KPI	Key Performance Indicator
LAG	Local action group
MARC	Multi-Actor Regional Constellation
PMS	Policy Monitoring System
RCM	Region of Central Macedonia
SA	Support Action
SAP	Support Action Portfolio
SRA	Southern Regional Assembly
SWOT	Strengths, Weaknesses, Opportunities & Threats
VA	Validation Action
WP	Work Package

Executive Summary

The ROBIN Toolbox is a digital platform that has been developed to support European regions in designing and implementing effective bioeconomy governance models and strategies. This document (Deliverable 3.2) reports on the activities carried out by all partners, tool owners and the consortium as a whole in order to test, validate and improve the toolbox during the project duration.

D3.2 presents the outcomes of a thorough validation and improvement process conducted between March 2024 and March 2025. Our structured multilayered approach aimed to ensure multiple testing – via an alpha and beta testing – as well as a broad testing base both in terms of regional coverage and stakeholder types. The process involved five partner regions – Andalusia (Spain), Baden-Württemberg (Germany), Central Macedonia (Greece), Southern Region (Ireland) and Žilina (Slovakia) – as well as eighteen external regions that participated through regional events and an open call for beta testing.

Hundreds of stakeholders, representing local governments, businesses, academia, and civil society were actively engaged in both testing phases. The ROBIN project placed particular emphasis on inclusive participation and regional diversity, with all partners involved in presenting, testing, and refining the Toolbox and its components: the Knowledge Platform (KP), the Support Action Portfolio (SAP), the Circular Bioeconomy Governance Model Canvas (CBGMC), the Policy Monitoring System (PMS), and the Environmental Protection Planning Tool (EPPT).

Throughout the testing period, each partner region implemented at least ten support actions (Key Performance Indicator – KPI-6) tailored to their specific context, addressing local needs such as policy alignment, stakeholder awareness, identification of funding opportunities, and strategic planning. In parallel, validation actions tested the individual Toolbox components and collected feedback through standardised questionnaires. The results of these actions exceeded the project's key performance indicators, such as involving more than ten external regions in the validation process (KPI-2) and integrating over twenty-three opportunities for accelerating bioeconomy transitions – well beyond the initial target of 10-15 (KPI-7).

The beta testing phase saw a notable expansion in stakeholder origin, engagement and interest. Two European-level online workshops were organised as part of the open call. In addition, each partner region involved at least two external regions in stakeholder engagement events. These sessions, which drew participation from regional authorities in external countries such as Denmark, France, and Slovenia as well as from other regions within partner countries, provided hands-on experience with the Toolbox, fostered peer learning, and resulted in positive feedback. Stakeholders recognised the value of the Toolbox for supporting co-creation processes, filling policy gaps, and fostering regional collaboration on bioeconomy initiatives.

The feedback collected during alpha and beta testing led to improvements in usability, guidance materials and integration of the Toolbox into existing regional strategies. Stakeholders across different sectors – including bioenergy, agri-food, and sustainable product development – contributed to fine-tuning the tools, making the latest version of the Toolbox more relevant, accessible, and practical.

Today, the ROBIN Toolbox stands as a validated and co-created resource, ready to support regional authorities and stakeholders in accelerating the transition to bioeconomy. It offers tailored roadmaps based on governance models and user profiles and serves as a tool for advancing circular and sustainable development across Europe.

The Toolbox is publicly available at <https://robintoolbox.web.auth.gr>.

The main bulk of this report concerns on the one hand the presentation of the support and validation actions carried out in Andalusia, Baden-Württemberg, Central Macedonia, Southern Region of Ireland and Žilina and on the other hand the results of our two testing phases and the final version of our Toolbox. This report also provides concluding remarks and insights from the whole testing and fine-tuning process.

Now, if you are interested in the activities carried out in each partner region, Section 3 will be most relevant.

If you are interested in the testing results which led us to develop our current (final) version of the Toolbox, then Sections 4-5 will be most interesting.

If you are interested in the potential usage of the Toolbox according to stakeholder type or to your regional governance model, Section 6 will be most relevant.

If you are interested in the insights and lessons learnt we gained from this process, then check Section 7.

1. Introduction

In the frame of ROBIN project, we developed a toolbox designed to support Regional Authorities to develop bioeconomy governance models and strategies. The ROBIN Toolbox is available here: <https://robintoolbox.web.auth.gr/>.

This document (D3.2) reports on the activities carried out by all partners, tool owners and the consortium as a whole in order to test, validate and improve the Toolbox.

This report is structured as follows:

Section 2 explains the **multilayered & multi-step approach we followed** in order to ensure multiple testing (alpha and beta testing) as well as a broad testing base (both in terms of stakeholder types and regional coverage).

Section 3 details the **support and validation actions carried out in each of the five partner regions** by the regional nodes (local partners): Andalusia in Spain, Baden-Württemberg in Germany, Central Macedonia in Greece, Southern Region in Ireland and Žilina in Slovakia. These actions took place between March 2024 and March 2025 in the frame of our so-called “alpha testing” and “beta testing”. Alpha testing ran from March 2024 till August 2024 whereas beta testing ran from September 2024 till March 2025.

Section 4 focuses on the **results of the alpha testing phase**. S2i had collected feedback from all partners and involved stakeholders. Their analysis led to a number of recommendations for improvement of the different tools and components of the Toolbox. Based on these recommendations, tool owners (CTA, MTU, QPL, AUTH) improved their respective tools and toolbox components. In this first testing phase, we concentrated on partner regions.

Section 5 shows the **results of the beta testing phase**. In this second phase, the consortium not only engaged stakeholders from the five partner regions but also from 18 external cities and regions to test and validate the updated Toolbox. Feedback was again collected and analysed in order to further improve the Toolbox and its different components. At the end of beta testing, tool owners fine-tuned their respective tools and toolbox components.

Section 6 focuses on **user roadmaps** (according to stakeholder types) and **usage roadmaps** (regional governance model) of the Toolbox.

Section 7 draws some **conclusions and provides insights from the whole testing and fine-tuning process**.

2. Approach

The current Chapter describes the overall approach that we followed to test the ROBIN Toolbox in real-life settings across our target regions and fine-tune the Toolbox and its constituent tools, building on feedback.

In order to develop an effective toolbox the ROBIN consortium used a multi-layered approach to validate it. The ROBIN consortium carried out two rounds of testing (called “alpha” and “beta” testing) during which each regional node carried out various support and validation actions. In the frame of these support/validation actions, project partners presented the Toolbox and used its different components with local stakeholders. Whereas alpha testing focused on partner regions, beta testing included external regions. In the beta testing, there were two main opportunities for participation of external regions: the Open Call (see Section 2.3) and stakeholder engagement events organized by the regional nodes.

Figure 1 below shows the 6-steps approach used to test and fine-tune the Toolbox.

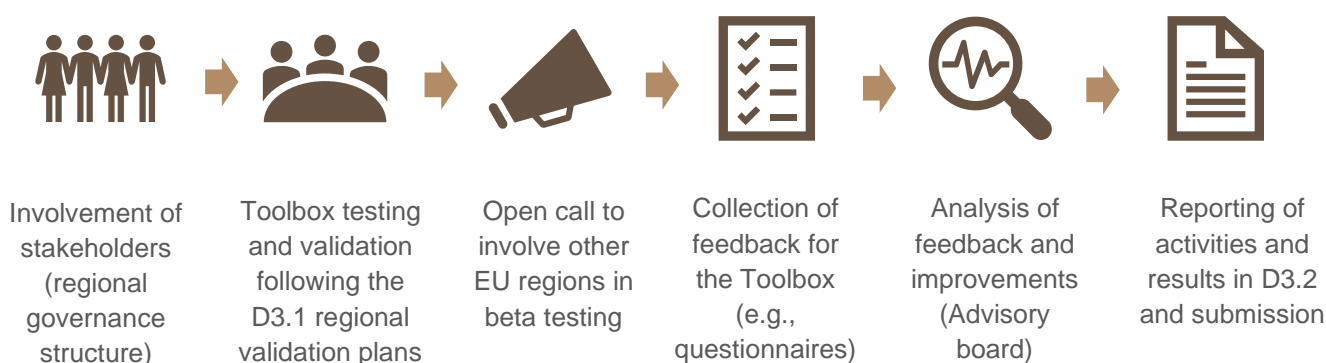


Figure 1: Steps for Toolbox testing and fine-tuning

Our approach consisted of 6 key steps, where all partners worked collaboratively on the following:

Step 1 – Involvement of stakeholders: Between March 2024 and March 2025, regional nodes activated the circular bioeconomy governance structures they had designed earlier in the project, engaged the MARC members and other stakeholders and operated the alpha and beta testing teams. In addition, 18 external regions participated in workshops and feedback sessions, contributing to further improving the Toolbox and fostering cross-regional learning. Engagement strategies varied but consistently emphasised collaboration, co-creation, and strategic communication.

Step 2 – Toolbox testing and validation: The five regional nodes implemented a wide range of support and validation actions, including at least 10 support actions (SA) per region and several validation activities to test ROBIN Toolbox components (**Section 3 Actions for Toolbox Testing and Validation** provides a detailed summary of all actions). Regional nodes also organised two main stakeholder engagement events per region — one during alpha testing and one during beta testing — often combining them with validation actions. These efforts, supported by regular coordination, strategic communication, and collaboration with other initiatives, ensured broad participation and meaningful feedback to improve the Toolbox' usability and regional impact.

Step 3 – Open call: To attract interest in beta testing, the ROBIN project launched an Open Call for regional authorities from the European Union (EU) and hosted two interactive online testing workshops in December 2024 and January 2025. A targeted communication campaign supported outreach, and 9 external cities and regions explored the ROBIN Toolbox, shared feedback, and discussed local bioeconomy strategies. Feedback was highly positive, with many regions expressing interest in using the tools to co-create and scale up regional bioeconomy policies.

Step 4 – Collection of feedback: After each validation and support action, feedback was collected. For each testing round, S2i prepared two feedback tools: one internal questionnaire to be filled by project partners and one questionnaire for external stakeholders.

Step 5 – Analysis of feedback and improvements: S2i analysed all feedback received and shared it with tool owners, i.e. partners responsible for toolbox components who then updated their respective tool/toolbox component and documented the improvements carried out after each testing phase. See Section 4 for feedback and improvements after alpha testing and Section 5 for beta testing.

Step 6 – Reporting of activities in D3.2: This document (D3.2) provides a detailed explanation and synthesis of the approach, activities and results.

2.1 Involvement of stakeholders

This section provides detailed information about the involvement of stakeholders, with a focus on regional authorities and the private sector.

Starting in March 2024, regional nodes set up and operated the circular bioeconomy governance structure for their respective regions. Concretely, they engaged the MARC members and other stakeholders that formed their alpha and beta testing teams and familiarized them with the work to be done in their region. In most cases, one organization (typically the regional authority) acted as the central node within the administration team, coordinating activities, facilitating meetings, and managing the team affairs to ensure a coherent strategy and direction. In more detail:

1. In Andalusia, the testing teams included the Administration Team (12 members), the Alpha Testing Team (50 regional stakeholders), and the Beta Testing Team (3 external regions). The regional circular bioeconomy governance structure was led by the ROBIN partners CTA, CAP and IFA, while the MARC members had a key role in communicating the project messages and invitation to the bioeconomy stakeholders in the region, significantly contributing to achieving the targets for sufficient public engagement.
2. The Region of Central Macedonia involved 19 people into its governance structure and engaged with over 100 stakeholders from various bioeconomy sectors during the alpha and beta testing phases. Stakeholders were selected through targeted invites to co-creation workshops, and continuous participation was ensured through regular updates and communication strategies. Key stakeholders from research institutions and industry associations were highly engaged.
3. In Baden-Württemberg, the Administration Team (2 members) involved more than 60 stakeholders in their support and validation actions. Key regional stakeholders were successfully involved. Stakeholders included MARC members, companies, public authorities, business support organizations, and higher education institutions. 3 external regions were included in the Beta Testing Team.

4. In the Žilina region, the regional node set up its governance structure with 16 people, including the MARC members and other stakeholders. All contributed to conduct testing activities, involving 36 stakeholders from the Žilina region and four other Slovak regions in a workshop. Stakeholders were engaged through various workshops and meetings, and the Slovak Administration team also participated in youth and public events to promote awareness.
5. The Southern Region engaged with over 120 stakeholders in the Irish bioeconomy during the alpha and beta testing. Stakeholders were selected from existing contacts in research, academia, industry, advocacy, and policymaking, and additional stakeholders were recruited through communications strategies and social media. MARC members and other stakeholders actively working on research, advocacy, and policymaking were particularly engaged.

Each regional node actively engaged external partners in validation activities during Beta testing. External regions were contacted to participate in workshops, knowledge-sharing sessions, testing and feedback sessions of various ROBIN tools. The purpose was to involve at least 10 external regional authorities (KPI-2) with the aim to improve the Toolbox and foster cross-regional learning. This was successfully achieved since **18 external regions and cities were involved**. In more detail:

1. In Andalusia, 3 external regions – Catalonia, Castilla y León, and Madrid – were involved in the beta-testing phase. These regions participated in the presentation and testing of the ROBIN Toolbox, providing positive feedback and expressing interest in its applicability and relevance to their work. The engagement was strong, with participants valuing the opportunity for coordination and exchange of experiences.
2. The Region of Central Macedonia engaged with four other regions: the Region of Central Greece, the Region of Thessaly, the Region of Western Macedonia, and the Region of Western Greece. Stakeholders from these regions provided input on the ROBIN tools, emphasizing the need for individualized policy support mechanisms aligned with regional strategic development goals.
3. In Baden-Württemberg, representatives from the Podravje region (Slovenia), Hessen (Germany), and North-Rhine-Westphalia (Germany) participated in the second stakeholder engagement workshop. They received information on the ROBIN project and its Toolbox, tested the Policy Monitoring System, and provided feedback. Their participation was active and constructive. This workshop helped raise awareness about different existing tools and methods supporting the elaboration and implementation of bioeconomy strategies, supported mutual learning and networking between stakeholders.
4. In Žilina, four further Slovak regions were involved in the support and validation actions: Banská Bystrica region, Trenčín region, Prešov region, and Nitra region. Representatives from the Banská Bystrica and Trenčín regions presented their bioeconomy development and successful pilot projects. The second stakeholder engagement workshop facilitated the exchange of best practices and knowledge among the participating regions.
5. In the Southern Region of Ireland all three regional assemblies (Southern Regional Assembly – SRA), Northern and Western Regional Assembly, Eastern and Midland Regional Assembly) participated in the support and validation actions. They assisted with testing and provided feedback on various elements of the ROBIN Toolbox. The feedback was largely positive, with one stakeholder intending to use the Canvas tool in upcoming workshops.

The ROBIN consortium particularly aimed to encourage the participation of the private sector. The level of private sector engagement differed across regions, reflecting local industry dynamics and resource availability. In more detail:

1. In Andalusia, private companies were most actively involved in validation workshops for the ROBIN Knowledge Platform, the Circular Bioeconomy Governance Model Canvas, and the Support Actions Portfolio, although some firms participated less due to resource constraints.
2. In Central Macedonia, companies in biogas, agri-food, and smart farming tested ROBIN tools and emphasized the importance of regulatory stability and financial incentives for investment in bioeconomy initiatives. The private sector in Central Macedonia showed keen interest in ROBIN, particularly within the renewable energy and agri-food industries. Additionally, under Support Action 6, a business model was developed, guiding three stakeholders in enhancing environmental performance based on the principles of circularity and bioeconomy: [*InCommOn*](#), [*Kafsimo*](#), [*Babylon cultural center*](#) and [*Act 4 Energy*](#).
3. In Baden-Württemberg, key companies participated from sectors including fertilizer, bio-based packaging, and vertical farming technologies (e.g. Agro Energie Hohenlohe GmbH, OutNature GmbH, and Vertical Farm Tech GmbH) playing an instrumental role in testing the Circular Bioeconomy Governance Model Canvas, thereby providing critical feedback.
4. In Žilina, private sector participation spanned industries including wood processing, agriculture, waste management, and bioenergy, with regional analyses highlighting the need for stronger governmental support and better coordination.
5. In the Southern Region, the Renewable Gas Forum Ireland and Gas Networks Ireland actively participated in validation actions, providing insights into policy barriers and investment challenges in the biomethane sector.

2.2 Toolbox Testing and Validation

Support Actions

Regional nodes implemented a set of support actions to validate the Support Actions Portfolio, contribute to the development of regional strategies and generate real impact for their regions. In particular, following KPI-6, they implemented at least 10 support actions in each region. The list of actions, along with a detailed description of their approach and outcomes, is provided in Section 3.1.

Support Actions (SA) refer to initiatives, measures, or interventions designed to address identified needs, challenges, or opportunities within the ROBIN regions. They were of three kinds: (i) analysis measures, (ii) social measures and (iii) technical measures, and they involved research on funding mechanisms, stakeholder engagement strategies, educational programs, or other targeted efforts to promote circular bioeconomy.

The support actions to be implemented by each region had been decided earlier in the project in D3.1. A key criterion considered when selecting them was to utilise and integrate opportunities in the local bio-based economies. These opportunities were identified and reported in the SWOT analysis of D1.3 “Circular Bioeconomy Governance Profiles of ROBIN Regions” (SWOT stands for Strengths, Weaknesses, Opportunities, Threats).

The ROBIN project incorporated into the support actions it implemented at least 23 opportunities for a quicker bioeconomy transition, which went beyond the target of 10-15 (KPI-7). More information

on these opportunities is provided within the description of the work performed for every support action in Section 3.1. Indicative examples include SA2 and SA3 from Andalusia, which addressed social awareness weaknesses and leveraged regional strengths in human capital and innovation, advancing the Andalusian Circular Bioeconomy Strategy. In the Region of Central Macedonia (RCM), SA2 utilized local organic waste for biogas production, encouraging collaboration and supporting the regional Circular Bioeconomy Governance Model. In Baden-Württemberg, SA2 provided input for the updating the Sustainable Bioeconomy Strategy by identifying implementation challenges and proposing actionable solutions. In Žilina, SA5 capitalized on EU and local funding opportunities identified in the SWOT, while SA10 supported energy self-sufficiency. In the Southern Region, SA1 contributed to the bioeconomy knowledge bank, and SA8 helped overcome funding barriers, fostering bioeconomy development.

QPL as Work Package (WP) 3 leader set up monthly meetings to coordinate all this work. In these meetings, regional nodes presented the work done in the previous weeks and what they planned to implement in the following month. They also reported any issues they had faced and exchanged opinions with the other partners to come up with solutions. In some cases, regional nodes also set up meetings every one or two weeks to allocate and coordinate their work in their region.

In parallel, as proper communication was essential for the successful implementation of support actions involving external stakeholders, regional nodes mobilised their social media accounts to communicate any events and directly contacted their networks. They also asked WR (responsible for communication and dissemination activities) and S2I (responsible for clustering activities) to share any social media posts to spread the word about regional events.

Additionally, S2I shared information about regional events with the CCRI and the Rural Bioeconomy Alliance to reach a broader audience and engage with a community of committed circular economy stakeholders. Finally, regional nodes often disseminated the results of any analysis measures through the project website or the Zenodo platform.

Validation Actions

Regional nodes implemented a set of validation actions to test the ROBIN tools and all the other Toolbox components. Each regional node implemented at least 4-6 validation actions. These actions included the organisation of institutional meetings, stakeholder events, surveys and discussions. The list of actions, along with a detailed description of their approach and outcomes, is provided in Section 3.2.

Validation Actions (VA) refer to a set of actions designed by regional nodes to validate the Toolbox components and gather feedback to suggest improvements. The Validation Actions focused on validating the ROBIN Toolbox components specifically, i.e. i) the ROBIN knowledge platform; ii) the ROBIN Tools (Circular Bioeconomy Governance Model Canvas - CBGMC, Policy Monitoring System - PMS and Environmental Protection Planning tool - EPPT) and iii) the ROBIN Support Actions Portfolio (SAP).

The implementation of validation actions across regional nodes proceeded as planned in D3.1, with each partner selecting a tailored set of actions to test the ROBIN tools and toolbox components. During the Beta testing, regional nodes involved representatives from at least two additional EU regional authorities to broaden the feedback pool and foster dissemination of the Toolbox' impact. Additionally, regional nodes used social media and collaborated with other regional initiatives to enhance the visibility and participation in their events. The results of the validation actions were collected and reported according to the established timeline.

Stakeholder engagement events

In parallel to support and validation actions, each regional node organized two stakeholder engagement events: one during the Alpha testing and a second one during the Beta testing. The second stakeholder engagement events were aligned with the regional workshops from Task 4.2. MARC members of all partner regions were invited to these workshops and helped communicating the events to a broader audience of bioeconomy stakeholders, significantly contributing to achieving a sufficient public engagement. Additionally, they provided insightful feedback for further improving the Toolbox.

In addition to the above-mentioned stakeholder engagement events, ROBIN partners often organized additional events. In such cases, regional nodes established synergies with other regional initiatives to share the costs of organizing the event and increase stakeholder participation.

Also, regional nodes sought synergies within ROBIN by combining their main stakeholder engagement events with their VA. For this, the event descriptions and overall event reporting are provided together with the description of the VA in Section 3.2.

The first main stakeholder engagement events (Alpha testing) took place:

- In Andalusia on 21 March 2024, with 17 participants (see VA1 description),
- In Central Macedonia on 29 May 2024, with 21 participants (see VA3),
- In Baden-Württemberg on 18 July 2024, with 13 participants (see VA1),
- In Žilina on 28 May 2024, with 16 participants (see VA1),
- In the Southern Region on 25 June 2024, with 14 participants (see VA3).

The Beta testing expanded to include a wider range of regional authorities beyond the consortium. This phase aimed to provide additional feedback and ensure the Toolbox' adaptability and usability. the second main stakeholder engagement events took place:

- In Andalusia on 13 March 2025, with 27 participants (see VA4 description),
- In Central Macedonia on 27 February 2025, with 50 participants (see VA5),
- In Baden-Württemberg on 6 February 2025, with 16 participants (see VA9),
- In Žilina on 4 December 2024, with 36 participants (see VA5),
- In Southern Region on 5 December 2024, with 28 participants (see VA5).

The engagement of diverse regional stakeholders throughout both phases ensured that the Toolbox accurately addressed the needs of different regional governance models and bioeconomy strategies. Ultimately, these actions helped enhance the Toolbox' usability, setting the stage for its broader application in future circular bioeconomy governance initiatives.

2.3 Open Call

To attract additional interest, ROBIN released an open call for EU regional authorities that wished to participate in beta testing and organized two online testing workshops for them. This initiative aimed to provide early access to the ROBIN tools and methodologies designed to enhance bioeconomy policy implementation. During the workshops, participants explored the Toolbox, asked questions and shared their feedback.

First, a mini communication campaign was launched to ensure that we received adequate applications for our Open Call. Specifically, our project partner WR integrated an application form

into the project website, explicitly mentioning the benefits that a participating region would gain. Then, it promoted the Open Call through the project social media accounts, while all partners reposted it to increase the announcement outreach. At the same time, in the mutual learning workshop in Stuttgart on 9 October 2024, we presented the Open Call specifications and asked representatives of other projects to share the application form with any regional authorities they worked with or had access to. Finally, S2I communicated the Open Call to the projects we were synergising with for the same purpose.

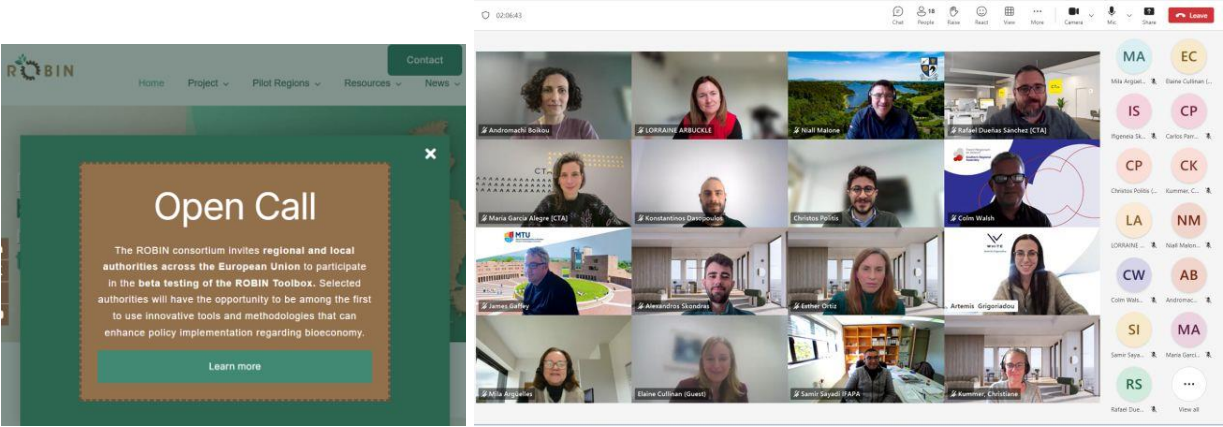


Figure 2: (a)The Open Call banner as shared on the project website, (b)Screenshot from the 2nd workshop

The workshops were held on 12 December 2024 and 16 January 2025. Participants had the flexibility to choose the date that best suited their schedule. Each workshop lasted a maximum of 2 hours and followed a structured agenda (Figure 3). During the hands-on session, participants were divided into breakout rooms, where they could explore the parts of the Toolbox that interested them most, with the support of consortium partners who also attended to moderate the workshop. Participants also had the opportunity to network with peers from across the EU, exchange best practices, and explore potential collaborations to advance bioeconomy policies within their respective regions.



AGENDA – Beta Testing Workshop

Start time: 11.00 CET
Location: Online. Join [here](#). Meeting ID: 385 349 347 580, Passcode: GusV57

Time	Topic
11.00 – 11.10	Welcome <i>Tour de table and brief project presentation</i>
11.10 – 11.40	Toolbox presentation <i>Presentation of the key elements, functionalities and tools</i>
11.40 – 12.00	Networking break
12.00 – 12.40	Hands-on session <i>Participants are invited to use parts of the toolbox they liked the most in breakout rooms with the support of our consortium partners</i>

Figure 3: Agenda of the beta testing workshop

There were 9 workshop participants from various regional authorities and organizations. Among others, representatives from the following organizations participated: the Regional Council of Pays de la Loire from France, the County Councils of Monaghan, Galway, Cork, Roscommon and Tipperary from Ireland, the Skive Municipality from Denmark, Teagasc (i.e. Agriculture and Food Development Authority in Ireland) and the Covenant of Mayors EU (i.e. a European co-operation movement involving local and regional authorities).

The feedback from the workshops highlighted an overall high level of engagement and interest in the ROBIN Toolbox. Several participants, including stakeholders from Denmark and France, expressed interest in exploring the tools further, especially in the context of local bioeconomy governance. Several participants highlighted that while local municipalities are engaged in energy and health-related policies, there is no cohesive strategy for bioeconomy initiatives, and businesses are not yet aligned to work together effectively. Thus, the potential of the ROBIN Toolbox as a useful co-creation tool for future initiatives was acknowledged. Consortium partners who participated in the workshops provided insights into the practical use of the ROBIN Toolbox, with examples from all regional nodes validating its application. This encouraged participants to view the Toolbox as a flexible starting point for bioeconomy policy development, particularly for regions less experienced in this area. The overall sentiment was positive, with many attendees appreciating the Toolbox' adaptability and expressing interest in using it for future workshops to co-create bioeconomy strategies and governance models. Several participants showed specific interest in facilitating a workshop for local stakeholders and further exploring how the Circular Bioeconomy Model Canvas could be applied to their regional context. At the same time, there was a recognition that further alignment and scaling of initiatives are needed at the local and regional levels.

2.4 Feedback collection on the Toolbox

To optimally collect data from the validation of the ROBIN Toolbox, standardized feedback tools were developed by Task leader S2i in cooperation with the tool owners (AUTH, QPL, MTU, CTA).

For the alpha testing phase two such feedback tools were employed: "ROBIN Internal Toolbox Validation Tool" and a "Collection of validation questions for stakeholders".

- The **Internal validation tool** was an online questionnaire that all partners were required to fill in after completing one of their Validation Actions. It contained a total of 37 questions ordered in 4 main sections: i) General questions, ii) User experience & functionality, iii) Relevance & Quality and iv) Impact. This tool allowed for a standardized collection of feedback that could later be analysed in detail. A total of 55 questionnaires were collected during alpha testing and analysed by S2i. The results of this analysis are listed in Section 4 of this document.
- The **Collection of validation questions for stakeholders** was a repository of 22 questions that partners were encouraged to share with external stakeholders participating in the validation actions. This repository allowed partners to design individual questionnaires targeted at the specific validation action stakeholders were participating in and gave them control over the mode of delivery (online or on paper, in English or local language, etc.).

For the beta testing phase the feedback tools were re-evaluated:

- The **Internal Validation Tool** was shortened since several of the questions were considered sufficiently evaluated. The new version contained a total of 22 questions and was again shared with partners in an online format. Partners were required to fill in the tool after each validation action performed.

- Since stakeholder feedback (also from external regions) was of heightened interest during beta testing it was decided to replace the “Collection of validation questions for stakeholders” with a standardized online questionnaire that would be easier to distribute and analyse. The **Feedback questionnaire** contained 12 questions and partners were encouraged to share it with all stakeholders participating in beta testing activities.

S2i also prepared reporting templates for tool owners to document the update of their toolbox components.

2.5 Analysis of feedback and improvements

Since Sections 4 and 5 are devoted to the analysis of feedback and the related improvements, suffice to say here that S2i analyzed all collected feedback from regional nodes (administration teams), stakeholders from partner regions and external regions (alpha and beta testing teams) and presented the results to:

- Tool owners (after Alpha & Beta testing)
- ROBIN consortium (after Alpha testing)
- Advisory Board (after Alpha testing)
- MARC Members (after Alpha testing)

In its analyses, S2i identified areas of improvements. Individual tool owners – in close cooperation with Task Leader S2i and AUTH as responsible partner for the digital Toolbox – prepared suggestions to address these areas and further recommendations and recorded the changes carried out.

Advisory Board Validation Workshop

After Alpha testing and subsequent analysis of the results, a Validation workshop was organized on 26 September 2024 to evaluate progress, gather further feedback, and discuss future improvements. The workshop was organized online and addressed the usability and effectiveness of the tools developed in the frame of the ROBIN project through presentations, feedback, and open discussions with 31 participants from the ROBIN consortium, the ROBIN Advisory Board, and the ROBIN MARC members.

The agenda contained three presentations:

1. **Overview of the ROBIN Toolbox:** Presentation by Nadja Schlichenmaier (S2i), covering the Toolbox and its individual components, their function and applicability.
2. **Alpha Testing Methodology:** Presentation by Nadja Schlichenmaier (S2i) providing an overview of the methodology applied for alpha testing and data collection, as well as the actions carried out in the different regions and the stakeholders involved.
3. **Alpha Testing Results:** Presentation by Nadja Schlichenmaier (S2i) showing a detailed analysis of all feedbacks gathered during alpha testing for each Toolbox component of including strengths, areas for improvement, and suggestions for enhancing user experience.

Each presentation was followed by a discussion and the main outcomes are as follows:

- **Successes:**
The alpha testing phase was broadly successful, with positive reception regarding user experience and functionality.
- **Focus Areas for Improvement:**
 - Enhanced user guidelines and practical examples.
 - Improved user-friendliness, including video tutorials and simplified navigation.

- Integration of tools into existing regional and transformative strategies.
- **Future Outlook:**
Continued efforts to engage diverse stakeholders, including civil society, and a focus on adaptable and synergistic bioeconomy tools to drive sustainable regional development.

The results from the discussion were taken into account during the first update of the Toolbox.

The next Section (**3. Actions for Toolbox Testing and Validation**) compiles all support and validation actions performed by each regional node.

3. Actions for Toolbox Testing and Validation

3.1. Support Actions


This section provides a list of support actions implemented in each ROBIN region, along with a detailed description of their approach and outcomes.

3.1.1. Andalusia (ES)

The following Support Actions took place in Andalusia (Table 1). More information about each support action is provided below.


Table 1: Support Actions in Andalusia

	Support Action	Milestone (M) or key result (R)	Month of completion
1	<u>Identification of key stakeholders for regional bioeconomy development</u>	Database	M30 February 2025
2	<u>Awareness raising about circular bioeconomy potential as study field and job career among the youth</u>	Events	M30 February 2025
3	<u>Networking activities among all relevant regional, national and international stakeholders</u>	20 stakeholders	M28 December 2024
4	<u>Regional situation diagnosis</u>	Report	M28 December 2024
5	<u>Alignment of the regional bioeconomy strategy with regional strategies and legislation</u>	Report	M30 February 2025
6	<u>Proposal to update some measures of the Andalusian Circular Bioeconomy Strategy</u>	Report	M30 February 2025
7	<u>Identification of bioeconomy research centers at the regional level</u>	Database	M30 February 2025
8	<u>Identification of possible sources of funds and an analysis of funding opportunities for the development of the regional bioeconomy</u>	Report	M28 December 2024
9	<u>Development of awareness plan about circular bioeconomy</u>	Report	M30 December 2024
10	<u>Benchmarking analysis of the potential structure of a circular bioeconomy node at regional level</u>	Report	M31 March 2025

	Support Action 1
	Identification of key stakeholders for regional bioeconomy development
<p>The availability of a repository of regional entities with key stakeholders of the quadruple helix will facilitate the implementation of the actions of the Andalusian Circular Bioeconomy Strategy. In</p>	

addition, they can be considered to be part of the future node of circular bioeconomy node. This repository is a living document that will serve as a basis for the regional government and can be updated after the end of the ROBIN project.

The objective of SA1, completed on 06 February 2025, was to identify key stakeholders for regional bioeconomy development in Andalusia to facilitate value chain construction and the creation of a market for bio-based products. Stakeholders include those who participated as speakers at events like the Circular Bioeconomy Forum (Seville, November 2023) and Cajamar Bioeconomy Day (April 2024), along with entities from the Andalusian MARC, success stories from the Circular Economy Observatory, and frequent collaborators with CAP and IFA. The key outcome is a structured repository of 50 stakeholders from the quadruple helix model (public, private, academic, and civil sectors), with consideration for productive sector and territorial representativeness. This repository will support the implementation of the Andalusian Circular Bioeconomy Strategy and serve as a living document for future updates, supporting the region's bioeconomy node even after the ROBIN project concludes.

	<p>Support Action 2</p> <p>Awareness raising about circular bioeconomy potential as study field and job career among youth and students</p>
<p>This support action was implemented through the celebration of four events to raise awareness among young people, students and society: IFA organised a dynamic session where agricultural sustainability practices in the field of bioeconomy were developed. There was a session where high-impact research projects such as ROBIN and RECICLAND 2.0. were presented (Demonstration and Information Activities for Managing Solid Waste from Protected Horticulture).</p> <p>CAP held a bioeconomy awareness day as part of the Open Government Week to present its initiatives and projects aimed at young people and society. CAP participated in the training course "Entrepreneurship and Innovation for the Valorisation of Agricultural Biomass" at the University of Almeria, presenting bioeconomy initiatives and projects, including ROBIN. The events were conceived and designed with inspiration from the ROBIN portfolio of support actions.</p> <p>CTA, in collaboration with Andalucía Emprende, the Regulatory Council of the Designation of Origin Poniente de Granada, IFA and CAP; organised a competition for innovative ideas on olive bioeconomy, called 'Express Ideas Competition: Let's undertake in the olive grove!', within the framework of the SCALE-UP project.</p> <p>The details of each of these events are described below:</p> <p>On 18 December 2023, IFA organised the dynamic session at its Mojonera centre in Almeria. It targeted 46 vocational students in agriculture, forestry and horticulture with the aim of stimulating interest and promoting career opportunities in the circular bioeconomy. The initiative highlighted sustainable agricultural practices and projects such as ROBIN and RECICLAND 2.0.</p> <p>On 13 June 2024, CAP hosted the Bioeconomy Awareness Day in Seville, presenting bioeconomy initiatives and bioproducts to 30 people.</p> <p>On 9 July 2024, CAP participated in the above-mentioned training course at the University of Almeria, presenting its bioeconomy initiatives and projects to 25 students.</p> <p>On 19 November 2024, the event "Express Ideas Competition: Let's undertake in the olive grove!" brought together more than 80 agricultural vocational training students from the Federico García</p>	

Lorca secondary school in Churriana de la Vega (Granada), who were able to work on creating innovative ideas to make use of olive residues or by-products. ROBIN project and Andalusian Circular Bioeconomy Strategy were presented as examples of good governance models and practices.

The support action aimed to inform young people and students about the potential of the circular bioeconomy as a subject of study and possible career. Three events were organised to raise awareness among students, young people and citizens.

The Andalusian SWOT analysis identified as a weakness the lack of social awareness about the circular bioeconomy and its implications, as well as the insufficient promotion of products and services derived from circular bioeconomy activities. The implementation of this support action has addressed and improved this weakness. In addition, the Andalusian Circular Bioeconomy Strategy (ACBS) includes measures to raise awareness among citizens, and this support action has effectively promoted the regional vision of the ACBS. It has initiated a trend in the region, encouraging the organisation of similar events in the future.



More info

<https://robin-project.eu/ifapa-organises-awareness-sessions-on-the-circular-bioeconomy/>

<https://www.bioeconomiaandalucia.es/noticias/la-estrategia-andaluza-de-bioeconomia-una-oportunidad-para-el-territorio-del-olivar/>



Support Action 3

Networking activities among all relevant regional, national and international stakeholders

This support action was carried out through a series of key events involving stakeholders vital to the development of the Andalusian circular bioeconomy. These initiatives aimed to foster synergies and international cooperation, particularly with Central American regions. CAP, in collaboration with IFA and JRC (Joint Research Centre), organized the Circular Bioeconomy Forum, which united stakeholders from the quadruple helix at regional, national, European, and Central American levels. Other significant events included CAP and IFA's participation in Bioeconomy Day by the Grupo Cajamar Foundation, as well as the conference on "Challenges of the Bioeconomy in Andalusia and Spain." Additionally, CAP, IFA, and CTA contributed to the conference on "Bioeconomy in the Olive Sector as a Lever for Economic and Social Transformation" under the SCALE-UP project, and shared their experiences through the INTERCOONECTA project with Central American regions.

This support action offered a platform for participants to exchange experiences and network with stakeholders from various regions. On 21 November 2023 CTA participated in the Circular Bioeconomy Forum in Seville jointly organised by CAP and IFA, attracting over 350 participants

both in person and online. On 23 April 2023, CAP and IFA took part in the Bioeconomy Day, bringing together over a hundred stakeholders. On 14 May 2023, they participated in the "Challenges of the Bioeconomy in Andalusia and Spain" conference in Almería, with more than 50 attendees. The SCALE-UP event in Linares on 6 June 2024, gathered more than 80 participants. As part of the INTERCOONECTA project, CAP and IFA have engaged with stakeholders across eight Central American countries through online sessions since 2022. This support action has bolstered Andalusia's strengths in innovation, knowledge, and technological capacity related to the circular bioeconomy, reinforcing the regional vision outlined in the Andalusian Circular Bioeconomy Strategy (ACBS) and promoting future events in the region.

The Andalusian SWOT analysis identifies knowledge, experience, human capital and technological capacity as the main regional strengths in the bioeconomy sector - elements that have been strengthened by this action. In addition, the ACBS includes actions to promote cooperation and synergies between key actors. This support action has helped to promote the regional vision of the ACBS. It is creating a trend in the region to organise similar events in the future.



More info

<https://robin-project.eu/more-than-350-participants-at-the-circular-bioeconomy-forum-organised-by-andalusia/>



Support Action 4

Regional situation diagnosis

The primary goal of this action was to update the diagnosis of the bioeconomy landscape in Andalusia. To achieve this, several key actions were undertaken, including identifying high-potential sectors and industries, updating biomass resource data, conducting a SWOT analysis, and pinpointing challenges and barriers hindering bioeconomic development. Additionally, the existing policy framework was reviewed and updated. This process relied on extensive desk research, involving the collection and analysis of documents, reports, statistical data, and technical studies from sources such as government agencies, scientific literature, and stakeholder consultations.

The main deliverable of this initiative was a comprehensive report, structured to provide a detailed overview of Andalusia's bioeconomy. It covered key areas such as biomass resources in various sectors (agriculture, fisheries, forestry, and livestock), a regional SWOT analysis, challenges and barriers to circular bioeconomy development, the regulatory framework, and conclusions. Given its target audience, the report was produced in Spanish to ensure accessibility and relevance for regional stakeholders.

This action directly addressed a priority identified by project partners and members of the Andalusian MARC during co-creation workshops under Task 2.1, which aimed to strengthen the sector through the establishment of a regional circular bioeconomy node. By updating the regional diagnosis, this initiative provides crucial insights into growth opportunities and development pathways for the bioeconomy sector. Additionally, the potential for broader dissemination of the findings is being explored to maximize their impact, extend their applicability beyond the project, and contribute to wider policy and strategic planning efforts.



Support Action 5

Alignment of the regional bioeconomy strategy with regional strategies and legislation

This action, completed on 06 February 2025, aimed to analyse regional strategies and legislation in which the circular bioeconomy could play a significant role. A comprehensive review was conducted on various regional strategies to assess their objectives, targets, and alignment with key elements of the Andalusian Circular Bioeconomy Strategy (ACBS). In this way, the following documents were analysed:

- Andalusian Plan for the Competitiveness of the Agri-Food Sector. 2020-2022.
- Circular Economy Law of Andalusia. 2023.
- First Andalusian Strategy for the olive grove sector.
- First Strategic Plan for Greenhouse Fruit and Vegetables in Andalusia. Horizon 2030.
- Smart Specialisation Strategy for the Sustainability of Andalusia 2021-2027, S4Andalusia.
- Andalusian Environmental Framework Strategy (under development)
- First Strategic Plan for the Common Agricultural Policy.
- Agri-environmental measures applied to the agricultural sector.
- First Strategy for the Andalusian Agri-food Industry (under development).

The outcome of this action was a structured repository highlighting references to the ACBS and the circular bioeconomy in these regional strategies. This reinforced the ACBS as a central driver for sustainable development in Andalusia. By promoting the principles and objectives of the ACBS, the review emphasizes its importance in regional policy, serving as a key catalyst for social, economic, and territorial development. Additionally, the insights gained provide valuable input for future revisions of the ACBS or the creation of new policies and actions in the region.



Support Action 6

Proposal to update some measures of the Andalusian Circular Bioeconomy Strategy


This action, completed on 5 March 2025, aimed to review and update the measures of the Andalusian Circular Bioeconomy Strategy (ACBS) in light of current regulations and the evolving regional context. The ACBS, approved in 2018 with a framework until 2030, required an evaluation to ensure its measures aligned with the current regional situation. A repository has been prepared to facilitate this process:


- Review existing policies.
- Identify new regional sectoral plans and strategies.
- Update some measures of the Andalusian Circular Bioeconomy Strategy according to the new Andalusian plans and strategies.

As a main result of this support action, a well-structured repository has included the reviewing and updating process of all the measures of the Andalusian Circular Bioeconomy Strategy for the framework 2025-2030. In the repository, the measures of the strategic lines and the instrumental programmes have been reviewed according to the current regional legislation and policies and addressed to the agri-food value chain.

This support action strengthens the development and implementation of the Andalusian Circular Bioeconomy Strategy (ACBS). All the detailed information analysed will be published by the *Junta de Andalucía* in a document entitled "Action Plan for the Circular Bioeconomy in the Agri-food Value Chain 2030", in accordance with the Andalusian Government's guidelines for the approval and publication of official public documents.

This will provide a working framework for the next few years (2025-2030) to implement the Andalusian Circular Bioeconomy Strategy, which is focused on the agri-food value chain. The implementation of the ACBS is expected to generate positive environmental, social, economic and territorial impacts across Andalusia.


	Support Action 7
	<p data-bbox="354 1093 1214 1126">Identification of bioeconomy research centers at the regional level</p> <p data-bbox="164 1155 1428 1263">This action, completed on 27 February 2025, involved conducting an in-depth search of websites from key institutions involved in bioeconomy activities in Andalusia, resulting in an Excel database that compiles critical infrastructure and research groups for the regional bioeconomy.</p> <p data-bbox="164 1288 1428 1585">The database is divided into two main categories: a. singular infrastructure, which includes specialized facilities such as experimental farms, pilot plants, and biological resources; and b. research groups, which rely on these infrastructures for advanced studies in bioeconomy-related fields. The database contains four sheets in Spanish: "Bioeconomía," which details 115 singular infrastructures across agriculture, agrifood, food, livestock, aquaculture, and biotechnology, and "Research groups," which lists 567 research groups involved in or with potential for bioeconomy research. The database provides a comprehensive and accessible overview of Andalusia's bioeconomy resources.</p> <p data-bbox="164 1612 1428 1794">This support action not only helps identify existing infrastructures and expertise, reducing duplication and costs, but also fosters public-private collaboration by facilitating connections with relevant institutions. Ultimately, the database supports strategic actions to strengthen Andalusia's bioeconomy ecosystem, addressing challenges such as innovation diffusion, technology transfer, and cross-sector collaboration.</p>

	Support Action 8
	<p data-bbox="354 1942 1272 2011">Identification of possible sources of funding and an analysis of funding opportunities for the development of the regional bioeconomy</p>

The objective of this action was the identification of potential sources of funding and an analysis of financing opportunities for the development of the regional bioeconomy in Andalusia as a key regional tool to help identify the financial resources available to potentially support the implementation process of activities linked to the circular bioeconomy at regional level. For this purpose, a diversified funding portfolio was performed, including (1) programs of public funding at regional, national and European level for circular bioeconomy initiatives and projects, and (2) sources of private funding, including potential investors, for the development of the circular bioeconomy in the region. CTA developed a first comprehensive version of the funding portfolio that was reviewed by CAP and IFA.

The main outcome of this support action was a diversified funding portfolio in the form of a repository including the following information: (1) name of the funding/financial program, (2) scope, (3) sector, (4) funding agency, (5) description, (6) funding scheme, (7) minimum budget, (8) maximum budget, (9) type of beneficiaries, (10) type of activity funded, (11) deadline for submission and (12) website. A total of 49 records were included, covering funding/financial opportunities at regional, national and European level. Considering the main target audience of this resource, the repository was performed in Spanish.

This Support Action is directly addressing the regional vision of Andalusia included in the Regional Action Plan as some of the “Challenges to the potential creation of a circular bioeconomy node in the agrifood value chain” to be overcome are linked to financial aspects one of the main weaknesses identified in the the regional SWOT analysis in the co-creation event under T2.1. as “insufficiently flexible financing instruments for technology-based companies” or “difficulties in financing the transition from prototype to commercial scale-up of bioproducts”. The creation of this comprehensive repository aims at offering the Andalusian Circular Bioeconomy Ecosystem a complete and comprehensive one-stop shop gathering all the available funding opportunities.

	Support Action 9
	<p>Development of awareness plan about circular bioeconomy</p> <p>This action was performed based on a co-creation methodology with the regional project partners, MARC members and other relevant regional experts. CTA, CAP and IFA developed some preliminary work that was presented during the ROBIN Toolbox Validation Action nº1 of Andalusia, held in Málaga (Andalusia) on the 21 March 2024. This topic was used for the validation of the (1) Knowledge Platform for strategical inspiration, (2) Support Actions Portfolio for operational inspiration (focused on potential activities to be included in the CANVAS) and (3) CBGMC. CTA led the event, but CAP and IFA supported CTA both in the event preparation (including review of presentations and materials) and during the event celebration. They contributed as regional experts in the bioeconomy but also communication fields. After the event where all the discussions and information retrieved, CTA developed a first comprehensive draft of the report that was reviewed by CAP and IFA.</p> <p>The main outcome is a comprehensive report with key elements to foster bioeconomy awareness in Andalusia, mainly aimed at civil society as target audience, including key elements from an adapted model canvas based on ROBIN CBGMC, including the following main areas: (1) value proposition, (2) actions, (3) key alliances, (4) needed resources, (5) useful infrastructures, (6) target audiences segmentation, (7) key messages, (8) costs structure/requested budget, (9) available financial sources, (10) channels, (11) regional development requirements and (12) expected results. As part of the co-creation process during the ROBIN Toolbox Validation Action</p>

nº1 of Andalusia held in Málaga (Andalusia) on the 21 March 2024, 17 MARC and regional experts were involved as part of the alpha testing team. Considering the main target audience of this resource, the report was written in Spanish.

This support action is directly addressing the regional vision of Andalusia included in the Regional Action Plan: “Strengthening of regional tools and plans for the promotion and dissemination of the circular bioeconomy in Andalusia”, addressing one of the key elements included in the Andalusian Circular Bioeconomy Strategy (ACBS). The information retrieved during the workshop and included in the report could pave the way for strengthening communication strategies in the regions towards this target audience. In doing so, the action will contribute to mitigating one of the weaknesses identified with the MARC members when building the regional SWOT analysis in the co-creation event under T2.1., namely “social ignorance of what the circular bioeconomy means and implies, as well as deficient promotion of products and services derived from activities associated with the circular bioeconomy”.



More info

<https://robin-project.eu/robins-andalusian-team-held-its-first-robins-toolbox-validation-session-in-transfiere-2024/>



Support Action 10

Benchmarking analysis of the potential structure of a circular bioeconomy node at regional level

This action aimed to analyze the necessary steps and gather critical insights for establishing a circular bioeconomy node in Andalusia. A benchmarking analysis of similar platforms and governance models, such as bioeconomy hubs, provided inspiration for structuring the potential node. The action followed a co-creation approach, engaging three external regions (Catalonia, Madrid, and Castilla y León) alongside 25 Andalusian MARC members and regional stakeholders. The initiative was conducted as part of a workshop held at the Transfiere Forum in Malaga on 13 March 2025, alongside Validation Action No. 4 (Beta Testing). Representatives from participating regions shared their governance models and experiences in implementing public-private partnerships (PPP). The Circular Bioeconomy Governance Model Canvas (CBMGC) was used as a tool to outline a potential PPP structure for Andalusia’s circular bioeconomy. Following the workshop, CAP and IFA compiled all gathered insights into a repository, which was later reviewed by CTA.

The primary outcome of this action was the creation of a repository outlining potential PPP structures, incorporating governance models from Catalonia, Madrid, and Castilla y León. Additionally, it includes a proposed PPP framework for Andalusia, shaped by workshop

discussions and stakeholder feedback. Key elements in the repository include proposed activities, strategic partnerships, regional vision, expected benefits, and communication strategies.

This initiative aligns with Andalusia's Regional Action Plan and the Andalusian Circular Bioeconomy Strategy (ACBS), particularly in addressing the challenge of establishing a circular bioeconomy node in the agri-food value chain. The insights gathered and documented in the repository offer a foundation for shaping Andalusia's future bioeconomy node, facilitating informed decision-making and fostering stronger collaboration between public and private entities.



More info





<https://robin-project.eu/robin-stakeholder-engagement-workshop-at-transfiere-forum-spain/>

3.1.2. Central Macedonia (EL)

The following Support Actions took place in Central Macedonia (Table 2). More information about each support action is provided below.

Table 2: Support Actions in Central Macedonia

	Support Action	Milestone (M) or key result (R)	Month of completion
1	<u>Networking activities among relevant regional stakeholders</u>	(M) Workshop	M21 May 2024
2	<u>Food waste in terms of analysis of biomass resources and potential</u>	(R) Report	M24 August 2024
3	<u>Development of regional economy observatory</u>	(R) Report	M30 February 2025
4	<u>Identification of bioeconomy good practices at regional level</u>	(R) Report	M23 July 2024
5	<u>Identification of bioeconomy research infrastructures</u>	(R) Report	M30 February 2025
6	<u>Business support and social entrepreneurship in the bioeconomy</u>	(R) Report	M24 August 2024
7	<u>Development of communication material for local authorities</u>	(R) Material	M30 February 2025
8	<u>Stakeholder engagement: local authorities</u>	(M) Workshop	M24 September 2024
9	<u>Stakeholder engagement: academia</u>	(M) Workshop	M22 June 2024
10	<u>Development of a regional bioeconomy cluster</u>	(M) Workshop	M30 February 2025

	Support Action 1 Networking activities among relevant regional stakeholders
<p>The "Careers and Opportunities in the Bioeconomy Sector" satellite event, organized by Q-PLAN, took place within the context of the Bioeconomy Changemakers Festival at the Ok!Thess innovation hub in Thessaloniki on 14 March 2024. The event was crafted to provide students and young professionals with valuable insights into starting a career in the bioeconomy sector in Central Macedonia. Drawing inspiration from the ROBIN Support Action Portfolio, Q-PLAN collaborated with two other EU-funded projects, <i>GenB</i> and <i>BioGov.net</i>, to bring this initiative to life. The event was organized with support from the European Commission and featured a mix of informative sessions and motivational storytelling from successful professionals and entrepreneurs in the Greek bioeconomy sector.</p> <p>The event attracted 59 participants, comprising a diverse group including undergraduate students, postgraduates, researchers, policymakers, entrepreneurs, and private sector employees. The audience was predominantly female (70%) with 30% male attendees. Various awareness-raising activities were carried out, including email invitations, direct networking, and extensive social media campaigns on platforms such as Q-PLAN, GenB, BioGov.net, and ROBIN. Speakers also played a key role in promoting the event, while the career offices of local universities were informed. Event materials such as social media banners, posters, and the event program helped spread awareness and increase participation.</p> <p>The event was regarded as a valuable experience, especially because of the emphasis on storytelling, knowledge sharing, and the diversity of speakers. It highlighted the strong network of actors within the Greek bioeconomy ecosystem, emphasizing the need for continued collaboration to foster sector growth and international competitiveness. Despite the available infrastructure for bioeconomy education and career opportunities, a key takeaway was the limited awareness among young people regarding the potential for skills development and career paths in this field. The event successfully addressed this gap by spreading awareness and offering an excellent platform for networking, idea exchange, and exploring future collaborations.</p>	
	
More info	https://robin-project.eu/bioeconomy-changemakers-festival-thessaloniki-edition-event/
	Support Action 2 Food waste in terms of analysis of biomass resources and potential

This action was conducted by the Department of Industry, Energy, and Natural Resources of the Region of Central Macedonia. Over a six-month period, from February to August 2024, the team focused on collecting vital data regarding waste streams and biogas production capacities. They established collaboration with Regional Authorities, particularly the Departments of Industry, Energy, and Natural Resources in all seven Regional Units, to analyze the types of organic waste generated by local food industries. Concurrently, biogas plants were contacted to gather information on various inputs. The report synthesizes these findings, revealing the current state of biomass resources while emphasizing the limitations of the data collected. It underscores the importance of ongoing data collection and analysis to refine strategies for optimizing biogas potential and ensuring adaptations to shifts in production and waste generation - a proactive approach essential for enhancing sustainability in Central Macedonia.

The key output of the support action is the report titled “Analysis of Data Acquired by Regional Units & Biogas Plants in the Region of Central Macedonia Regarding Biogas Production and Waste Utilization.” This 6-page report consolidates vital data provided by the seven Departments of Industry, Energy, and Natural Resources across the Regional Units of Central Macedonia. In total 2 persons, the Head of the department of Industry, Energy and Natural Resources and one employee of the same department (2 Chemical Engineers in total) have been working on the analysis of the data provided by the 7 departments of RCM, with data concerning 35 food-related industries and 3 major biogas plants regarding their organic waste inputs. This comprehensive report marks a critical step in understanding and optimizing biomass resources in the region.

This action significantly advances the objectives outlined in the validation plan by enhancing the understanding of biomass resources in Central Macedonia. It aligns with the SWOT analysis (D2.1) by capitalizing on regional opportunities for biogas production, leveraging organic waste from local food industries. This action supports the regional vision for a Circular Bioeconomy Governance Model as described in D2.1 “ROBIN Regional Governance Models”, by fostering collaboration between authorities and industries, contributing to sustainable resource management. Moreover, it drives positive environmental impacts by reducing waste and promoting renewable energy, alongside economic benefits from biogas development. The initiative also enhances territorial cohesion, reinforcing Central Macedonia’s role as a leader in circular bioeconomy practices. Continued data collection is key to maximizing these impacts.



Support Action 3

Development of regional economy observatory

This action aimed in launching a Circular Bioeconomy Observatory as part of the ROBIN program to address food waste. This observatory focuses on monitoring, analyzing, and tackling food waste in the region. The implementation phase has involved collecting data from the Regional Units regarding large food processing and manufacturing facilities and creating a comprehensive record of biogas production units. This data will be further integrated into an online platform accessible to citizens, engineers, and business owners. Furthermore, RCM has been holding a series of meetings to define the governance structure, operational framework, and strategic objectives for the observatory. The ROBIN Toolbox has played a key role in guiding data collection and stakeholder engagement, with regional partners expressing strong support for the initiative.

The primary outcome of this initiative is the creation of the Food Waste Observatory platform, which will be hosted on the official RCM website. The platform will provide detailed data on food

waste management and biogas production from various Regional Units and biogas production units. This will enhance RCM's visibility and facilitate collaboration with external partners. Moreover, the platform will serve as a valuable resource for the business community, including consulting engineers and industry professionals, by offering information and insights on food waste management and biogas production opportunities within the region.

The Food Waste Observatory significantly strengthens RCM's capacity to monitor and manage food waste by making crucial data accessible to stakeholders. This initiative will improve decision-making processes by consolidating information from local authorities and industry players, ultimately promoting more effective waste management strategies. In the long term, the Observatory will help businesses in the food sector operate more efficiently and sustainably, providing targeted support to industry stakeholders. Additionally, the project has the potential to foster better resource utilization across the region, creating a foundation for long-lasting improvements in food waste management and circular bioeconomy practices.



Support Action 4

Identification of bioeconomy good practices at regional level

This support action was carried out in four key steps: first, previous findings from the ROBIN Project were reviewed. Next, relevant practices were identified by analyzing these findings and selecting those that best align with the regional context of Central Macedonia. The selected practices were then compiled and organized into a concise report. Finally, the report was shared with industry actors in Central Macedonia to provide them with actionable insights and inspiration for their transition to a circular bioeconomy.

Through this support action, three key good bioeconomy practices were identified, offering guidance to actors in Central Macedonia as they move from linear to circular bioeconomy operations. Additionally, the analysis highlighted growth potential in four key areas for the region. These findings were summarized in a 15-page report.

The work done in the context of this action equips industry actors in Central Macedonia with the knowledge and tools needed for their transition to a circular bioeconomy. This action contributes to the region's long-term vision of developing a Bioeconomy Cluster, fostering collaboration and networking among stakeholders, and driving business success. It also serves as a valuable resource for policymakers, helping guide their efforts in navigating the transition to a circular bioeconomy.



Support Action 5

Identification of bioeconomy research infrastructures

This action, completed on 19 February 2025, was carried out in four key steps. First, a thorough analysis of bioeconomy research infrastructures in Central Macedonia was conducted. Next, the most relevant infrastructures were identified and selected based on their alignment with the action's objectives. These selected infrastructures were then organized, and a concise report was drafted, outlining their details. Finally, the report was disseminated to industry actors in Central

Macedonia, showcasing the region's advanced infrastructures and expertise, thus promoting the transition toward a bioeconomy-driven future and sustainable economic growth.

The main output of this support action was the identification of two major bioeconomy research infrastructures: CERTH's iBO and AUTH's KEAGRO. The report emphasizes the strengths of these institutions and their potential for collaboration with key stakeholders, including industry players, government bodies, and local communities. It also highlights the growth opportunities associated with these infrastructures, identifies potential research areas to accelerate the bioeconomy transition, and offers recommendations for further development. This information is compiled in a 50-page report.

This action provides a roadmap for stakeholders by mapping and evaluating key infrastructures, facilitating informed decision-making and regional planning for a sustainable bioeconomy. The report serves as a foundational document for the development of a bioeconomy cluster in Central Macedonia, guiding the integration of CERTH's iBO and AUTH's KEAGRO into the region's cohesive bioeconomy strategy.



Support Action 6

Business support and social entrepreneurship in the bioeconomy

This support action was dedicated in developing business models to set sustainability principles in the beneficiaries' overall business operations with the aim of improving their environmental performance. The key steps that were followed were to complete the basic Business Model Canvas elements and also to add new ones that are aligned with the sustainability targets. Therefore, dedicated environmental interventions were suggested along with a plan for implementation. For the elaboration of the support action, valuable insights and material were received from the ROBIN Toolbox, mostly Regional Governance Models, Good Governance Practices, Circular Bioeconomy Model Canvas, Environmental Protection Planning tool, etc.

The main key outputs are the four reports of the support services which have been sent for verification to the beneficiary and will be kept in the project repository in pdf version. The current documents represent a business model in 6-11 pages with approximately 6-10 stakeholders involved in the proposed business activities that improve the environmental performance according to the principles of circularity and bioeconomy.

The particular business models entail an analysis of the environmental and social risks along with the dedicated mitigations measures required to tackle all these issues. Therefore, the focus of the business models is not only to structure a proper business case that targets only financial

profitability but also to consider and demonstrate environmental and social benefits as an addition to the economic ones.

The current support action contributes to the development of circular bioeconomy with the:

- Proper structure of business case to be aligned with sustainability principles
- Environmental and social dimensions to be included as core aspects of business
- Implementation of a composter for the treatment of particular waste and the compost production as bioproduct
- Usage of recycled bins for particular waste (glass, paper, plastic, etc.)
- Development of a regional waste management plan
- Development of training programs dedicated to sustainability, circularity, etc.



Support Action 7

Development of communication material for local authorities

This action involved several key steps to develop communication materials for local authorities and policymakers under the ROBIN project. Initially, RCM participated in a focus group organized by the South-East European Research Centre (SEERC) as part of the DIGI Step Project. The focus was on creating communication materials that provide practical skills on sustainability. RCM maintained ongoing communication with SEERC for feedback and experience exchange. The working group then met with stakeholders to gather input on the content of the materials, which were further refined through local stakeholder group meetings. RCM then edited, reviewed, and designed the materials, contracting printing services to produce physical copies for distribution at workshops, such as Beta Testing and the Final Event.

The main objective of the communication materials was to make complex scientific findings accessible and actionable for local authorities and policymakers. These materials aimed to guide the integration of sustainability and resilience into local policies, promote knowledge-sharing, and strengthen the decision-making capacity of policymakers. As a result, a series of leaflets were developed, which have been sent for verification and will be stored in the project repository in PDF format for future reference.

The impact of these materials is significant, as they help local authorities better understand the benefits of nature-based solutions and promote the integration of sustainable land management practices. The materials also foster stronger collaboration between local governments and environmental organizations, encouraging greater involvement of policymakers in project activities and decisions. To ensure the long-term success of the project, it is recommended to regularly update and expand these materials, incorporating feedback and utilizing digital platforms for wider dissemination. This ongoing communication strategy will help maintain the ROBIN project's impact and support its goals.



Support Action 8

Stakeholder engagement: local authorities

The Region of Central Macedonia (RCM), in collaboration with the Regional Development Fund of Central Macedonia (RDF) and the Organisation for Economic Co-operation and Development (OECD), organized a three-day workshop-dialogue from July 3-5, 2024, as part of the OECD Programme on the Circular Economy in Cities and Regions and the Circular Cities and Regions Initiative (CCRI). This event, held in the new hall of the Regional Council, aimed to engage key stakeholders, including local, regional, and governmental representatives, universities, businesses, and non-profit organizations, to discuss the implementation of the circular economy in the region. The OECD’s circular economy program involves 10 cities and regions, including Central Macedonia, as case studies to assess and promote the transition to a circular economy.

The OECD mission in Thessaloniki focused on gathering both quantitative and qualitative data through detailed questionnaires that explored environmental, socio-economic, and institutional trends, challenges, and governance frameworks related to circular economy practices. The draft study is expected by October 2024, with the final report scheduled for completion in February 2025. A central event organized by the OECD in April 2025 will present the outcomes of all participating cities and regions. The study will provide valuable insights for advancing the circular economy in Central Macedonia and will be shared with stakeholders for feedback.

The CCRI initiative plays a pivotal role in promoting the transition to the circular economy by supporting cities and regions in creating new business opportunities, reducing waste, and fostering sustainable development. By focusing on governance frameworks and the conditions necessary for a circular economy, the OECD program facilitates the exchange of best practices and experiences across regions. The initiative’s alignment with the European Union’s Circular Economy Action Plan 2020 (CEAP) underscores its significance in accelerating the transition to a circular economy, with special emphasis on sectors like industrial symbiosis, bioeconomy, circular construction, and resource management.



Support Action 9

Stakeholder engagement: academia

For the implementation of this support action, AUTH organized the event titled “Stakeholders engagement event: Academia”. The event took place at the Research and Dissemination Center (KEDEA) in Thessaloniki, on 29 May 2024. In this event, the needs and challenges of the Region of Central Macedonia regarding the implementation of circular bioeconomy in the region were discussed, and opportunities and means to strengthen cooperation between the academic community and the Region of Central Macedonia to promote the circular bioeconomy were explored. AUTH presented the ROBIN project to stakeholders from academia and other groups, and RCM presented the framework of the region of Central Macedonia. AUTH followed up with a hands-on presentation of the ROBIN Toolbox. Specific focus was given to the parts that concerned the Bioeconomy Governance Model Canvas as well as the Support Action Portfolio and how these two ROBIN tools assisted the region in searching and choosing its support actions. A session was

followed during which AUTH inquired the stakeholders regarding the regional bioeconomy status, notable needs and challenges in their region and finally a fruitful discussion between the academia stakeholders and the regional stakeholders took place.

The event was attended by 21 participants, representing diverse profiles such as members of the scientific community, policy makers and industry members. The audience was composed of 9 female and 12 male attendees. Promotion of the event included a mix of email invitations, direct networking as well as engaging AUTH’s media offices for the dissemination of the event. Finally, posters for the event and flyers were created and an agenda for the event was developed.

The primary goal of this action was to foster collaboration and knowledge exchange in Central Macedonia and local academic entities. By engaging with universities and the scientific community, the action’s aim was to bring academia, policy makers and industry together to facilitate mutual learning but also to identify areas of potential collaboration and contribution between academia and the bioeconomy cluster. For that reason, AUTH dedicated a big portion of the event to explaining the vision of the ROBIN project and by utilizing specific questions, AUTH was able to identify topics and requests from academia, elaborate on topics that are missing in the implementation of the bioeconomy, and discuss the potential contribution of academia to the proposed bioeconomy cluster. From the gathered answers, it was evident that the scientific community actively participates in research and innovation programs and is quite informed on the bioeconomy strategies of the region. It was shown that the scientific community is actively seeking collaboration between academia and the regional stakeholders. The academia stakeholders believed that this collaboration could create positive impacts in the region both at a level of knowledge transfer and exchange of good practices between the region and academia, as well as financial support for programs that have to do with regional bioeconomy in the region and the creation of new business opportunities. The biggest challenge in implementing this collaboration is that it requires a more openness level from the region and the universities themselves and an enhancement of local regional models and policies as well as direct communication between the stakeholders. Most of the academic stakeholders were enthusiastic on the prospect of a creation of the regional node’s regional vision (creation of a bioeconomy cluster for all stakeholders of the region) and would be willing to participate and collaborate in the development and the support of this regional vision.

More info

<https://labgeo.plandevol.auth.gr/robin-stakeholders-engagement-event-academia-in-thessaloniki-greece/>



Support Action 10

Development of a regional bioeconomy cluster

This action elaborated a Regional Bioeconomy Cluster Development Plan, which was officially presented during the ROBIN project’s Beta Testing Workshop on February 27, 2025, at the Regional Council Hall in Central Macedonia, Thessaloniki. The goal was to discuss the creation of a regional bioeconomy cluster that fosters collaboration among businesses, research institutions, and policymakers.

The main milestone was the presentation of the Development Plan, which outlined the cluster’s structure, governance models (including self-governing or lead organization models), and strategic objectives focused on innovation, circular bioeconomy practices, and policy recommendations. It

also proposed funding sources, such as EU programs like Horizon Europe and the CBE Partnership, as well as private sector involvement. Over 20 participants from academia, industry, and government attended the event, contributing to the discussion about the cluster.

This support action plays a crucial role in creating a unified bioeconomy ecosystem in Central Macedonia by mapping regional stakeholders and promoting cross-sector collaboration. The impact includes environmental benefits through sustainable resource management, economic growth through bioeconomy-focused businesses, and social gains by enhancing collaboration between academia, public authorities, and the private sector.



More info

<https://qplan-intl.gr/news/robin-project-beta-testing-workshop-in-central-macedonia/>


3.1.3. Baden-Württemberg (DE)


The following Support Actions took place in Baden-Württemberg (Table 3). More information about each support action is provided below.

Table 3: Support Actions in Baden-Württemberg

	Support Action	Milestone (M) or key result (R)	Month of completion
1	<u>Identification of previous topics in the implementation of the bioeconomy</u>	Report	M27 November 2024
2	<u>Identification of gaps in the implementation of the bioeconomy</u>	Report	M20 April 2024
3	<u>Creation of more matchmaking opportunities between stakeholders</u>	Meeting	M30 February 2025
4	<u>Define target groups in the bioeconomy sector</u>	target group identified	M19 March 2024
5	<u>Identification of gaps in the education sector related to the bioeconomy</u>	Report	M30 February 2025
6	<u>Identification of gaps in the communication material for civil society</u>	Report	M28 December 2024
7	<u>Inform civil society about bioeconomy</u>	Report	M30 February 2025
8	<u>Identification of gaps in funding schemes related to the bioeconomy</u>	Report	M23 July 2024
9	<u>Thematic exchange with other federal states of Germany</u>	Collaboration plan	M23 July 2024

10	<i>Mutual exchange on tools for improving governance structures</i>	Report	M27 November 2024
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	Support Action 1
	Identification of previous topics in the implementation of the bioeconomy
<p>This support action involved a detailed analysis comparing the original 2019 “Sustainable Bioeconomy Strategy” and the updated 2024 version, with the goal of identifying successfully implemented measures, ongoing initiatives, and new additions. The analysis, conducted by S2i, was compiled into a 19-page report, which can serve as a valuable resource for regions looking to establish or enhance their own bioeconomy frameworks.</p> <p>Both strategies follow a similar structure, defining principles, objectives, and an action plan. The 2019 strategy focused on sustainable development, reducing fossil fuel dependency, and integrating bio-based solutions to enhance regional value creation and environmental protection. The updated 2024 strategy builds on these goals and expands to include support for innovative product development, circular carbon use, and municipality-driven local implementations.</p> <p>Key updates in the 2024 strategy include expanded goals supporting global biological transformation and innovation, enhanced principles promoting carbon storage, circular systems, and sustainable product development, and new measures to improve regulatory frameworks, foster stakeholder cooperation, and scale up promising technologies. The strategy also strengthens networks and clusters to promote the dissemination of sustainable solutions.</p> <p>These strategic updates aim to position Baden-Württemberg as a leader in sustainable, circular bioeconomy development, facilitating cross-sector collaboration and promoting practical, innovative solutions for ecological and societal challenges.</p>	

	Support Action 2
	Identification of gaps in the implementation of the bioeconomy
<p>This support action focused on identifying gaps in the implementation of the bioeconomy in Baden-Württemberg through a workshop using the Circular Bioeconomy Governance Model Canvas (CBGMC). Ten participants and four moderators (from BIOPRO and S2i) worked in two sessions: one on value propositions and improvements in bioeconomy implementation, and another on identifying support actions for future strategic developments in Baden-Württemberg and Europe (for further details, please refer to D2.1).</p> <p>The workshop identified key barriers and challenges to sustainable bioeconomy implementation in Baden-Württemberg, which were categorized into five groups. Additionally, six actions to address these challenges were developed. The results of this process are summarized in a 10-page report and detailed in D2.1.</p>	

This Support Action supported the development of the updated Sustainable Bioeconomy Strategy for Baden-Württemberg by highlighting the obstacles to implementation and proposing actionable solutions.



Support Action 3

Creation of more matchmaking opportunities between stakeholders

This action focused on enhancing matchmaking opportunities among stakeholders in the bioeconomy sector. The first step involved utilizing the Support Action Portfolio to identify existing measures related to matchmaking and networking, resulting in the identification of five relevant initiatives. The second step involved desk research to create a database of bioeconomy networks, initiatives, and clusters in Baden-Württemberg. This was followed by discussions with network and cluster leaders to explore additional matchmaking opportunities, with the goal of identifying a new area that could benefit from the creation of a new cluster or network.

The key milestone of this action was the development of a comprehensive databank listing existing bioeconomy initiatives and clusters in Baden-Württemberg, accompanied by a report that summarizes the findings. While the action aimed to support the implementation of the Sustainable Bioeconomy Strategy for Baden-Württemberg, particularly in the area of "Network and Cluster initiatives" (M7), its impact was limited, as outlined in the final report. Nonetheless, the gathered data provides valuable insights for future efforts in creating new matchmaking opportunities within the bioeconomy sector.



Table 1: Overview of networks, clusters, initiatives and projects in the field of bioeconomy in Baden-Württemberg

Type	Name	Topic/Area	Focus	Organizers	Link
Cluster Initiatives	Bioeconomy Cluster in the Rhine-Neckar Metropolitan Region	Bioeconomy, innovation support	Strengthening bioeconomy through regional cooperation and innovation support	Metropolregion Neckar GmbH	https://bioeconomie.baden-wuerttemberg.de/Lde/Startseite/ClusterInitiative
Specialized Initiatives	NATURALFiber BW	Natural fibers, sustainable materials	Integration of natural fibers into regional value chains	Allianz Faserbasierte Werkstoffe Baden-Württemberg e.V. (AFBW)	https://bioeconomie.baden-wuerttemberg.de/Lde/Startseite/Bildungs-+und+Fachinitiativen
	Specialized Initiative on Phytopharmaceuticals and Valuable Plant Ingredients	Phytopharmaceuticals, plant-based ingredients	Promotion of plant-based ingredients in pharmaceuticals and industry	BIOPRO Baden-Württemberg GmbH	https://www.biopro.de/projekte/bereich-gesundheitsindustrie/fachinitiativen-phytopharmakawerfgebende-pflanzeninhaltsstoffe
	PFBau	Biobased construction, sustainable architecture	Development and application of biobased building materials	Technologieregion Karlsruhe GmbH	https://bioeconomie.baden-wuerttemberg.de/Lde/Startseite/Bildungs-+und+Fachinitiativen
	EAT-PROTEIN	Alternative proteins, food innovation	Research on alternative protein sources for nutrition and industry	Universität Hohenheim	https://bioeconomie.baden-wuerttemberg.de/Lde/Startseite/Bildungs-+und+Fachinitiativen




Support Action 4

Define target groups in the bioeconomy sector

The work on this support action was divided into three main steps: 1) Identifying the target groups already included in the Baden-Württemberg Bioeconomy Strategy; 2) Using the Knowledge Platform to identify additional target groups; and 3) Preparing a summary report.

S2i compared the target groups from the Baden-Württemberg strategy with those identified in 20 governance models on the Knowledge Platform. As a result, four new target groups were identified, and the findings, along with the methodology used, were documented in a 14-page report.

This action supported the development of the updated Sustainable Bioeconomy Strategy for Baden-Württemberg by identifying additional target groups for inclusion.




Support Action 5

Identification of gaps in the education sector related to the bioeconomy

This action focused on identifying gaps in the education sector related to the bioeconomy in Baden-Württemberg, which was carried out in two steps. First, desk research was conducted to develop a comprehensive database, followed by an exchange with experts and stakeholders to gather further insights. This process led to the identification of four key areas for intervention: 1) academic education, 2) vocational education, 3) general education and awareness-raising, and 4) regional collaboration and policy alignment. For each of these areas, specific actions were proposed to address the gaps, with the results compiled in the final 15 page report.

The impact of this action directly supports the implementation of the updated Sustainable Bioeconomy Strategy for Baden-Württemberg, particularly Action Area 1, which focuses on creating a supporting framework for the bioeconomy, including the qualification and training of skilled professionals. The identified gaps and suggested actions align with and can contribute to three specific measures of the strategy: M9 (Competence Centre for applied bioeconomy in rural areas), M11 (Enhancing knowledge transfer for strengthening companies), and M12 (Strengthening bioeconomy competence in vocational training and education). These recommendations will help shape the region's bioeconomy education framework and drive future growth.



1. Current state of the education sector

Baden-Württemberg's circular bioeconomy strategy puts a strong emphasis on Research and Development. A quick search of the *Forschungsnetzwerk* of the German state for bioeconomy related projects funded in Baden-Württemberg over the last 10 years (2015-2025) yields 357 entries with a volume of 135 Mio €, a strong majority of them funded by the Federal Ministry of Education and Research (*Bundesministerium für Bildung und Forschung - BMBF*). This is of course just a part of the funds that went into Research and Development projects in the bioeconomy sector, not including projects funded by the EU, the federal state of Baden-Württemberg and its departments, etc. For a more complete overview of all projects currently happening in the *bioeconomy* sector, jointly coordinated by the Ministry of the Environment, Climate Protection and the Energy Sector and the Ministry of Food, Rural Affairs and Consumer Protection can be referred to¹. Successful research and development talent is a key factor which makes the education sector crucial for sustainable development of bioeconomy in Baden-Württemberg.

On first glance the education sector of Baden-Württemberg is well-positioned to support the bioeconomy, with a diverse network of institutions including universities, research centres, and vocational schools. The *Forschungsnetzwerk* gives an overview of different institutions that cover bioeconomy listing a total of 147 institutions (see Table 1 below).

Institution Type	Count
Universities	87
Universities of Applied Science	16
Research institutes	21
Departmental Research	13
Total	147

Table 1: Overview of different research institutes covering bioeconomy in Baden-Württemberg


Furthermore, Baden-Württemberg offers several vocational programmes offering educational pathways towards professions in the bioeconomy sector as well as dedicated "biotechnology secondary schools" offering students a general education with a specific focus on biotechnology. This diverse landscape ensures that educational opportunities are offered to people at different stages of their career.


¹ <https://www.forschungsnetzwerk.de/en/bioeconomy>

² <https://www.forschungsnetzwerk.de/en/bioeconomy>

³ <https://www.forschungsnetzwerk.de/en/bioeconomy>

⁴ <https://www.forschungsnetzwerk.de/en/bioeconomy>

	<div>Support Actions 6 & 7</div> <div>Identifying Gaps in the communication material for civil society and Enhancing Communication for Civil Society</div>
	<p>These support actions aimed to assess and improve communication strategies related to the bioeconomy in Baden-Württemberg by identifying gaps and engaging with civil society. The process was carried out in two key phases. First, desk research was conducted to develop a comprehensive database of existing communication materials, identify relevant stakeholders, and prepare structured interviews. In the second phase, exchanges with MARC members, regional representatives, and other stakeholders were held to evaluate the effectiveness of current materials and identify areas for improvement. Given the strong thematic overlap, both actions were merged to streamline efforts and ensure a more cohesive approach. The gathered insights were synthesized into a single report, validated using the ROBIN internal Toolbox, ensuring that the recommendations align with the region's bioeconomy strategy.</p> <p>The merged assessment identified four critical gaps in bioeconomy communication: accessibility, awareness, engagement and interactivity, and relevance to everyday life. To address these gaps, targeted actions were proposed, covering improvements in public outreach, engagement strategies, and content adaptation to better connect with civil society. These findings and recommendations were consolidated into a final report (SA6_Report_final.pdf), providing a structured roadmap for enhancing bioeconomy-related communication.</p> <p>The outcomes of these actions directly support the implementation of the <u>updated Sustainable Bioeconomy Strategy for Baden-Württemberg</u>, particularly contributing to Measure 13 (Bioeconomy information and education campaign) and Measure 17 (Consumer-oriented product and process innovations along the food value chain). The insights gathered will help refine communication strategies, making bioeconomy-related information more accessible, engaging, and relevant for the general public. This, in turn, will strengthen public awareness and involvement in sustainable bioeconomic initiatives.</p> <div data-bbox="534 1373 1045 1727"><p>2. Areas for improvement</p><p>From our reports and meetings with experts as well as recommendations of civil society we identified four main areas of improvement and actions to be taken:</p><p>Area 1 – Accessibility</p><p>The communication material should be further improved or rather be more accessible with an easy-to-understand message.</p><ul style="list-style-type: none">• Documents should not assume prior knowledge about sustainability and circular economy• Use plain language to explain bioeconomy concepts without technical jargon• Bring on board specialist editors or translators to increase key texts (especially in official websites)• Provide ROBIN-style summaries tailored to target groups• Use more infographics<p>Area 2 – Awareness</p><p>In order to further increase public awareness:</p><ul style="list-style-type: none">• The communication material, especially educational resources, should be supported by additional communication measures: radio spots, social media, or adverts• Use Popular Communication Channels (e.g. Instagram, Facebook, LinkedIn, Twitter) to reach out and engage youth<p>Area 3 – Engagement & Interactivity</p><p>Develop more the interactivity of products:</p><ul style="list-style-type: none">• Incorporate more interactive features (e.g. online)• Provide more spaces for public engagement and knowledge exchange (e.g. events or discussion boards)• Facilitate and use interrelated, no active social media channels and toolboxes• Use more formats such as Podcasts & Webinars that are engaging for the public<p>Area 4 – Relevance to everyday life</p><p>The communication material should increase its focus on everyday applications</p></div>

	<div>Support Action 8</div> <div>Identification of gaps in funding schemes related to the bioeconomy</div>
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To identify gaps in funding schemes related to the bioeconomy S2i analyzed the results of the WP2 workshop and developed a workshop concept and a survey to collect information from companies working on bioeconomy projects in Baden-Württemberg. The workshop started with a presentation of the ROBIN project and its Toolbox followed by a presentation of the [ShapingBio](#) project and their work on funding in the bioeconomy. After a break the results of the survey were presented, and the participants (10) and moderators (2) started into the working sessions:

- **Session 1:** Open group discussion on the strengths and weaknesses of the funding landscape in Baden-Württemberg
- **Session 2:** Snowball brainstorming session – collection of ideas to improve the access to funding for bioeconomy projects and innovations
- **Session 3:** Ranking of ideas according to How, Now, Wow Matrix
- **Session 4:** Development of the two most popular ideas using the CBGMC

This support action directly serves our objective of supporting the implementation of the updates Sustainable Bioeconomy Strategy for Baden-Württemberg by giving stakeholders from both policy (a representative of the Ministry for Rural Development introduced the strategy) and the business community to come together and develop strategies for improving the access to and effectiveness of funding in the bioeconomy.



Support Action 9

Thematic exchange with other federal states of Germany

This action aimed to foster the exchange of information, experience, and knowledge between stakeholders from various regions of Germany and Slovenia. S2i developed a workshop concept that included both theoretical and practical components. The theoretical part focused on tools and methods for developing, implementing, and monitoring bioeconomy strategies, including the ROBIN Toolbox and PMS. The applied part allowed regions to a. share their concrete experiences in using these tools and methods (Session 1); b. Exchange of experience on the preparation process of bioeconomy strategies in urban & rural areas (Session 2); and c. Exchange on the monitoring and implementation of bioeconomy strategies (Session 3).

The workshop, held on 06 February 2025 in Stuttgart, Germany, was attended by 16 stakeholders from academia, public administration, policy, and civil society. A key outcome of this exchange was the strengthened collaboration and knowledge sharing among stakeholders, creating a coalition of committed parties to promote bioeconomy efforts at regional, national, and European levels. This action directly contributes to support representatives from different (German) regions to exchange information, share experiences and learn from each other. It helped strengthen ties

between the stakeholders and support a coalition of the committed dedicated to promote bioeconomy in Baden-Württemberg, in Germany and in Europe.



More info [LinkedIn Post](#)



Support Action 10

Mutual exchange on tools for improving governance structures

S2i designed and organized a workshop to facilitate the exchange of knowledge, experiences, and best practices among stakeholders from different regions of Germany and Slovenia. The workshop aimed to strengthen collaboration and enhance understanding of bioeconomy strategy development, implementation, and monitoring. It was structured into three key sessions:

- Exchange on tools and methods – Discussion on existing frameworks such as the ROBIN Toolbox and PMS for developing, implementing, and tracking bioeconomy strategies.
- Strategy preparation in urban and rural contexts – Stakeholders shared experiences and approaches in crafting bioeconomy strategies tailored to different regional needs.
- A focused discussion on effective methods to track progress and ensure successful execution of bioeconomy strategies.

The workshop combined theoretical insights with practical case studies, offering participants hands-on learning opportunities from regions that had successfully applied the presented tools and methodologies.

The workshop took place on 6 February 2025, in Stuttgart, Germany, and was attended by 16 stakeholders from academia, public administration, and civil society. To extend the reach of the event, key insights and outcomes were shared via LinkedIn posts by S2i and ROBIN, and a detailed report was produced, summarizing key discussions and takeaways.

This action played a crucial role in fostering collaboration among German federal states, reinforcing ties between stakeholders, and creating a foundation for sustained knowledge exchange. By enabling regional representatives to share best practices and lessons learned, the initiative contributed to building a coalition of committed actors dedicated to advancing bioeconomy in Baden-Württemberg, Germany, and Europe. The strengthened network and shared insights will help guide future bioeconomy initiatives, ensuring more effective strategy development and implementation.


3.1.4. Žilina Region (SK)

The following Support Actions took place in Žilina Region (Table 4). More information about each support action is provided below.

Table 4: Support Actions in Žilina Region

	Support Action	Milestone (M) or key result (R)	Month of completion
1	<u>Identification of biomass sources availability and potential</u>	Report	M22 June 2024
2	<u>Identification of key actors in the region - project promoters - change agents</u>	Report	M22 June 2024
3	<u>Analyse the current priorities, needs and activities of Local Action Groups</u>	Report	M22 June 2024
4	<u>Identifying examples of good and bad practice from Slovakia</u>	Report	M22 June 2024
5	<u>Analysis of funding opportunities to finance measures</u>	Report	M22 June 2024
6	<u>Communication, involvement, developing relationships with actors</u>	Workshop	M21 May 2024
7	<u>Developing a plan for pilot actions and their implementation</u>	Report	M22 June 2024
8	<u>Definition of needs focusing on capacity building in the region in specific areas</u>	Report	M22 June 2024
9	<u>Implementation of awareness raising and education activities</u>	Workshop	M26 October 2024
10	<u>Validation of the Policy Monitoring Tool and the Environmental Protection Tool</u>	Report	M23 July 2024

An expert-led analysis titled “Regional Analysis of the Development of Bioeconomy in the Žilina Region” was designed for the needs of the implementation of the support actions 1-8. The analysis provided a comprehensive evaluation of the potential and challenges in advancing bioeconomy within the Žilina Region. Given that the region lacks a defined bioeconomy strategy, the aim was to generate a robust data-driven foundation for future decisions. A team of Slovak bioeconomy experts, working closely with PED and ZSK, conducted the research over several months, gathering valuable insights across various aspects of bioeconomy development. The analysis comprised detailed studies in several key areas, including biomass sources, key actors, local action groups (LAGs), funding opportunities, capacity building, and examples of good and bad practices, as well as recommendations for pilot actions and are described in detail in below sections. These areas were explored through targeted workshops and internal discussions with regional stakeholders, validating the data and refining the recommendations.

	Support Action 1
	Identification of biomass sources availability and potential
<p>The identification of biomass sources and their potential in the Žilina Region was an essential part of the expert analysis. The findings revealed that while the region has significant biomass resources, these are currently underutilized due to a lack of coordination and management. The</p>	

analysis highlighted the need for a structured approach to maximize the use of biomass, particularly within the framework of a circular bioeconomy.

In addition to the primary report, the findings were validated through two key workshops: the “Development of Bioeconomy in the Žilina Region” held on 28 May 2024 involving 16 key stakeholders in the region, and an internal workshop with the MARC members on 4 July 2024 which took place online. These events allowed stakeholders to provide feedback on how to improve biomass management practices.

The action helped define the biomass landscape in the region and outlined clear steps for more efficient biomass utilization. By promoting a circular bioeconomy, it emphasized the importance of coordinated land use and biomass management systems. Additionally, it supported the regional vision of bioeconomy by proposing environmental and economic strategies for better biomass utilization, thereby contributing to the region’s long-term sustainability goals.



More info <https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/>



Support Action 2


Identification of key actors in the region - project promoters - change agents


This action aimed to identify and map key actors within the bioeconomy sector in the Žilina Region. The analysis identified primary stakeholders, including businesses, research institutions, and local authorities, and assessed their roles in fostering bioeconomy development. However, it also revealed that while these actors exist, they often operate in silos, with limited coordination or support from the regional administration. The findings stressed the importance of fostering collaboration and providing logistical and administrative support to these actors.

The Support Action No 2 was supported by the Validation Action 1 which was carried out in the form of the Workshop titled "Development of Bioeconomy in the Žilina Region". The event was organized by PED and ZSK, it took place at the premises of the Žilina Self-Governing Region on 28 May 2024 and welcomed 16 key stakeholders in the region, encouraging the development of strategies to improve collaboration across different bioeconomy actors.

By mapping the key players in the bioeconomy landscape, the analysis offered valuable insights into how to strengthen networks and enhance cooperation. The action contributed to the long-term regional goals by promoting better collaboration among stakeholders, which is essential for advancing bioeconomy initiatives. It also proposed specific steps for building a more integrated and supportive ecosystem that would allow actors to work more effectively together, driving innovation and regional growth.

More info	https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/
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	Support Action 3
	Analyse the current priorities, needs and activities of Local Action Groups
<p>This analysis focused on understanding the activities and challenges of Local Action Groups (LAGs) in the Žilina Region, particularly in relation to bioeconomy development. LAGs are essential for community-based bioeconomy initiatives, yet they face significant challenges, including a lack of support from higher-level authorities and limited coordination between groups. The analysis identified the need for a central body to coordinate the activities of LAGs and ensure that their efforts are aligned with regional bioeconomy goals.</p> <p>The findings were validated through the workshops held on 28 May 2024 involving 16 key stakeholders in the region, and an internal workshop with the MARC members on 4 July 2024 which took place online. During the process, LAG representatives provided feedback on the proposed recommendations for improving LAG coordination and capacity.</p> <p>The action outlined key priorities and needs for LAGs, emphasizing the importance of regional support for local groups. It promoted the regional vision by fostering greater collaboration among LAGs, which is crucial for building local capacity in bioeconomy development. The proposed steps for better coordination and capacity building aim to empower LAGs and enhance their impact on regional development, ultimately contributing to the broader goals of a sustainable bioeconomy in the region.</p>	
More info	https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/

	Support Action 4
	Identifying examples of good and bad practice from Slovakia
<p>This action involved identifying successful and unsuccessful bioeconomy initiatives in Slovakia, providing insights into what works and what doesn't. The analysis found that many of the most successful bioeconomy projects in Slovakia stemmed from local initiatives, often involving smaller communities or businesses rather than large-scale governmental programs. These local projects were found to be more adaptable and easier to replicate, offering valuable lessons for bioeconomy development in Žilina Region.</p> <p>The findings were discussed in two workshops, one on 28 May 2024 involving 16 key stakeholders in the region, and an internal workshop with the MARC members on 4 July 2024 which took place online, where regional stakeholders highlighted the importance of learning from local successes and failures.</p> <p>The action successfully mapped examples of both good and bad practices, offering the region practical lessons on how to structure and scale bioeconomy projects. The identification of local initiatives as key drivers of change aligned with the regional vision of promoting decentralized, community-driven bioeconomy activities. By supporting the development of local networks and</p>	

value chains, this action provided clear guidelines for future bioeconomy projects and fostered greater collaboration at the grassroots level.

More info

<https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/>



Support Action 5

Analysis of funding opportunities to finance measures

The analysis of funding opportunities focused on identifying potential financial sources to support bioeconomy projects in the Žilina Region. The study revealed that while there are several funding sources, public information about these opportunities remains limited. A key recommendation was the decentralization of funding, ensuring that local and regional funds play a more prominent role in supporting bioeconomy initiatives, rather than relying solely on national sources.

This action was validated through workshops held on 28 May 2024 involving 16 key stakeholders in the region, and an internal workshop with the MARC members on 4 July 2024 which took place online. Stakeholders discussed the importance of accessible and transparent funding options for bioeconomy projects and identified a clear roadmap for financing bioeconomy initiatives, with an emphasis on decentralizing financial resources to empower regional and local actors.

This action grasped the opportunities identified in the SWOT analysis of our regional nodes since it outlined the possibility of drawing the EU funds as well as local funds, and promoted the regional vision of our CBGM model since it defined the funding possibilities. By focusing on both EU and local funding mechanisms, the analysis helped stakeholders better understand how to secure funding for their bioeconomy projects. The proposed steps are expected to stimulate investment in projects that create jobs and promote environmental sustainability, further advancing the region's bioeconomy.

More info

<https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/>



Support Action 6

Communication, involvement, developing relationships with actors

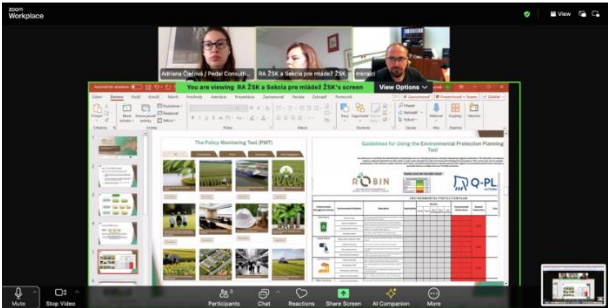
This action focused on improving communication and building relationships with key bioeconomy stakeholders in the Žilina Region. The primary platform for this was the “Development of Bioeconomy in the Žilina Region” workshop, which facilitated discussions between regional stakeholders on the opportunities and challenges in advancing bioeconomy. The event also served as a means of gathering feedback from stakeholders, particularly regarding the Robin Toolbox and the overall regional bioeconomy strategy.

This support action was also supported by the Validation Action 2 which was the Internal Workshop with the MARC members of the Žilina region, and by the Validation Action 2 which was the Internal Workshop with the MARC members of the Žilina region. The workshops on 28 May and 4 July 2024 played an essential role in fostering new relationships and strengthening existing ones, ensuring that stakeholders remained engaged throughout the process. New contacts and

relationships with the actors in the region were established and the relationships with the existing contacts were strengthened.

The action successfully improved stakeholder engagement, promoting better communication and cooperation across the bioeconomy sector in the Žilina Region. The workshops helped define the steps needed to build a more collaborative environment, aligning stakeholders with the region's long-term bioeconomy goals. The outcomes outlined the main steps and activities which need to be performed in both, short-term and long-term levels, in order to improve the collaboration among the stakeholders and promoted the regional vision of our CBGM model since it defined the capacity and collaboration development at the regional level.

By fostering stronger relationships, this action contributed to the overall capacity and collaboration development necessary for driving the bioeconomy forward.



More info <https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/>



Support Action 7

Developing a plan for pilot actions and their implementation


This action involved the development of a plan for pilot actions aimed at testing and scaling bioeconomy initiatives in the Žilina Region. The analysis identified the need for strong support from regional authorities, particularly in terms of logistical and administrative backing. The focus was on identifying regional “drivers of change” within the administration who could champion bioeconomy initiatives and provide the necessary support for pilot projects. Discussions during the validation workshops emphasized the importance of pilot projects in demonstrating the viability of bioeconomy concepts and building momentum for broader adoption.

The event was organized by PED and ZSK, it took place at the premises of the Žilina Self-Governing Region on 28 May 2024 and welcomed 16 key stakeholders in the region. The feedback from the stakeholders in the form of questionnaire was gathered on-site. This support action was also supported by the Validation Action 2 which was the Internal Workshop with the MARC members of the Žilina region, organized by PED in collaboration with ZSK. The event took place online via Zoom on 4 July 2024.

This action provided a clear framework for initiating and supporting pilot projects that would test bioeconomy concepts in the region. By proposing steps to ensure the successful implementation of these projects, the analysis contributed to the broader regional bioeconomy strategy. The development of pilot actions will not only help demonstrate the potential of bioeconomy but also provide a model for scaling these initiatives across the region.

More info <https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/>

	Support Action 8
	Definition of needs focusing on capacity building in the region in specific areas
<p>This action aimed to identify the key areas where capacity building was needed to support the development of bioeconomy in the Žilina Region. The analysis highlighted education and pilot projects as the most effective means of building capacity in the region. Stakeholders expressed the need for more targeted education programs in bioeconomy and the development of pilot projects to showcase best practices. These efforts are seen as critical to ensuring that local actors have the knowledge and resources to participate effectively in the bioeconomy. The analysis outlined the main steps which need to be performed to create a system of cooperation of regional actors, advance education activities and initiate pilot projects, thus supporting the capacity building in the region.</p> <p>The Support Action No 8 was supported by the Validation Action 1 which was carried out in the form of the Workshop titled "Development of Bioeconomy in the Žilina Region". The event was organized by PED and ZSK, it took place at the premises of the Žilina Self-Governing Region on 28 May 2024 and welcomed 16 key stakeholders in the region. The feedback from the stakeholders in the form of questionnaire was gathered on-site. The Support Action No 8 was also supported by the Validation Action 2 which was the Internal Workshop with the MARC members of the Žilina region, organized by PED in collaboration with ZSK. The event took place online via Zoom on 4 July 2024.</p> <p>This action identified the key needs for capacity building, particularly in education and pilot project development. The analysis proposed specific steps to improve collaboration among regional actors, advance education on bioeconomy topics, and initiate pilot projects. These efforts will contribute to the region's long-term bioeconomy strategy by equipping stakeholders with the necessary skills and knowledge to drive sustainable development.</p> <div data-bbox="392 1301 1198 1637">   </div>	
More info	https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/

	Support Action 9
	Implementation of awareness raising and education activities
<p>The ROBIN Slovak team, consisting of PED and ZSK members, actively engaged in a series of awareness-raising and education activities throughout Slovakia to promote the concept of circular bioeconomy. These activities took place across various regions and targeted diverse groups,</p>	

including youth, the general public, and professionals from multiple sectors. Key events included the "Family Day" in Námestovo (Northern Slovakia), the "Education Day for Schools 'Žilina Green Region'" at Budatínsky Castle in Žilina (Northern Slovakia), the "Innovation MeetUp Bioeconomy" Conference in Lučenec (Southern Slovakia), the "BioConnect" Conference in Banská Bystrica (Central Slovakia), the "Forum of Rural Parliament" in Žilina (Northern Slovakia), the 10th Annual Slovak Biogas Association Conference "The Future of Slovak Biogas 2024" in Zvolen (Central Slovakia), among others. These events offered an opportunity for the team to present key information about the circular bioeconomy and the ROBIN project, fostering greater awareness among various audiences. They distributed promotional materials, including ROBIN leaflets, and showcased the ROBIN roll-up to enhance visibility and understanding of bioeconomy principles.

The events were organized by PED within other projects, ZSK within their regional activities, and by external partners who invited PED and ZSK to participate. The milestones of this Support Action included the educational outreach and dissemination of knowledge to a wide range of stakeholders, including youth (secondary and grammar school students, university students), educators, public officials, innovators, business leaders, and representatives of public authorities and NGOs. The outreach activities targeted multiple regions across Slovakia—Northern, Southern, and Central Slovakia—ensuring a comprehensive geographic and demographic reach. This broad engagement helped raise awareness and build stronger relationships with stakeholders, particularly in the Žilina region, while creating a collaborative atmosphere for further bioeconomy development.

The impact and potential of this action was significant, as the awareness activities fostered the development of relationships with key stakeholders across Slovakia, enhancing the bioeconomy's visibility and collaboration within the region. These efforts directly contributed to building a more collaborative environment for bioeconomy development in the region, strengthening the foundation for future growth. Additionally, the outreach efforts were supported by the implementation of other validation actions (No. 1-5), further reinforcing the potential for widespread education on bioeconomy concepts. The success of these events and activities is expected to have lasting effects on promoting bioeconomy in Slovakia and beyond.



More info

<https://www.vipa.sk/xiii-forum-vidieka-2024-inteligentne-vidiecke-komunity-v-digitalnej-ere-buducnost-rozvoja-vidieka-na-slovensku>

<https://www.zilinskazupa.sk/sk/aktuality/aktuality/prvy-krajsky-environmentalny-festival-stredne-skoly-za-zeleny-kraj-prilakal-do-budatinskeho-parku-stovky-studentov.html>

https://www.carina-project.eu/carina_at_the_slovak_biogas_association_conference_2024/

<https://robin-project.eu/robin-project-was-presented-at-the-innovation-meetup-bioeconomy-in-slovakia/>

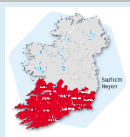
	<div>Support Action 10</div> <div>Validation of the Policy Monitoring Tool and the Environmental Protection Tool</div>
<p>The validation of the Policy Monitoring Tool and the Environmental Protection Tool in the Žilina Region took place in the form of a meeting with Mr. Matúš Krajčí, the Director of the Department of Regional Development of the Žilina Self-Governing Region. The meeting, held online via Zoom on 22 July 2024, was organized by ZSK and PED. During the meeting, ZSK presented the ROBIN Toolbox and its two components—the Policy Monitoring System (PMS) and the Environmental Protection Tool—to Mr. Krajčí. Following the presentation, a discussion was held to outline the next steps. Mr. Krajčí expressed his recognition of the potential of the ROBIN Toolbox and indicated that he would actively seek out municipalities that might pilot the Toolbox. This discussion marked a significant milestone as the Director showed a strong interest in the tools, suggesting that there was potential for long-term use and adaptation in the region.</p> <p>This action also involved the Internal Function and Content Validation Workshop (Validation Action 3), where both the Policy Monitoring Tool and Environmental Protection Tool were tested internally by representatives from the regional nodes. This workshop, held online via Zoom on 8 July 2024, included two PED members and one ZSK member. The internal validation allowed for thorough testing and feedback to refine the tools, ensuring they met the needs of regional stakeholders.</p> <p>The impact and further potential of Support Action No. 10 are significant. The combination of the VA4 meeting and the VA3 internal validation ensured that both Toolbox components were thoroughly tested in the Žilina region. This support action directly contributed to the defined objective by facilitating the validation of these tools and promoting their practical application. Moreover, the action helped leverage the opportunities identified in the regional SWOT analysis, particularly by supporting the adoption of climate change adaptation measures and promoting the transition to a circular economy. This includes focusing on the prevention and minimization of waste generation. Furthermore, the support action advanced the regional vision for the Circular Bioeconomy Governance Model (CBGM), supporting the development of a circular economy and enhancing energy self-sufficiency in the region. By encouraging the use of the Policy Monitoring Tool and the Environmental Protection Tool, SA No. 10 promoted environmentally-friendly practices and supported long-term, sustainable development in the region.</p> 	

3.1.5. Southern Region (IE)

The following Support Actions took place in Southern Regional Assembly (Table 5). More information about each support action is provided below.

Table 5: Support Actions in Southern Region

	Support Action	Milestone (M) or key result (R)	Month of completion
1	<u>Identification of relevant Bioeconomy Stakeholders</u>	Database	M21 May 2024
2	<u>Establish Consultative Board</u>	Workshop	M22 June 2024
3	<u>Engage with Local Authorities</u>	Event	M22 June 2024
4	<u>Bioeconomy Awareness Raising</u>	Event	M30 February 2025
5	<u>Education Mapping</u>	Database	M20 April 2024
6	<u>Highlighting regional Bioeconomy Innovation</u>	Database	M20 April 2024
7	<u>Biomass quantification</u>	Database	M20 April 2024
8	<u>Bioeconomy Funding assist</u>	Report	M30 February 2025
9	<u>Evaluate Governance Structures and policies</u>	Database/Report	M30 February 2025
10	<u>Examination of existing policies, strategies</u>	Database	M23 July 2024



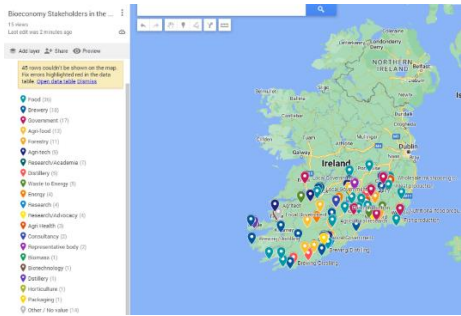
Support Action 1

Identification of relevant Bioeconomy Stakeholders

The Southern Regional Assembly (SRA) undertook a comprehensive mapping of key bioeconomy stakeholders in the southern region of Ireland through a desk-based research process conducted between April and May 2024. This research was heavily informed by the 2023 all-island Biomap Project, created by the Irish Bioeconomy Foundation and Intertrade Ireland. Building on this foundational map, the SRA developed a customized version focused specifically on the southern region using Google My Maps. This effort involved reviewing and updating information on stakeholders identified in the original Biomap, as well as adding new and emerging stakeholders discovered through county-level research across the region. Detailed data, including GPS coordinates and sector-specific descriptors, was compiled into an Excel spreadsheet, which was then organized by industry sector and uploaded to the Google My Maps platform.

As a result of this research, a total of 148 bioeconomy stakeholders were identified and categorized into 21 different industry sectors, ranging from agritech to waste management, energy, research, consultancy, and more. The mapping tool provides a clear and easily searchable graphic representation of these stakeholders, showcasing the diversity, interconnectedness, and regional distribution of bioeconomy actors in southern Ireland. This map serves as an important resource for stakeholders across various sectors, including manufacturers, researchers, policymakers, and public bodies, enabling them to access a more complete and detailed picture of the bioeconomy landscape in the region.

This mapping exercise directly supports the creation of the Southern Region Bioeconomy Regional Action Plan by providing a well-organized, accessible resource that can be referenced for future policy development and strategic planning. The map acts as a crucial data tool for policymakers to evaluate the bioeconomy sector’s health, identify sectoral strengths and gaps, and highlight synergies that could be further developed. It also contributes to the region's bioeconomy knowledge bank, reflecting the progress identified in the regional SWOT analysis. Furthermore, the map serves as a catalyst for engaging stakeholders, promoting collaboration, and driving the development of a cohesive bioeconomy strategy for the Southern Region.



Support Action 2

Establish Consultative Board

In early June 2024, SRA communicated with a range of bioeconomy stakeholders, ROBIN Project stakeholders and ROBIN MARC members, employing a quadruple helix methodology. As the Project has progressed and become more widely publicized through the Irish partner’s direct involvement in the sector and attendance at bioeconomy-related stakeholder events, SRA and MTU have encountered a growing number of stakeholders working in the bioeconomy sphere who are interested in sharing knowledge and expertise and becoming involved with the Project.

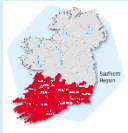
SRA and MTU took the view that our in-person alpha stakeholder event scheduled for 25 June 2024 (which also included validation of the Policy Monitoring Tool) would present an ideal opportunity to invite stakeholders who had a genuine interest in becoming part of our consultative board and in helping to shape a bioeconomy strategy and roadmap for the southern region. The invitation to become a part of our consultative board was made explicit in our invitation to the alpha validation event, and stakeholders were made aware of the level of work and time commitment associated with their membership. At the alpha validation workshop held in Assembly House in Waterford on 25 June 2024, a discussion was facilitated as to the shape and contents of a bioeconomy action plan for the region, who would bear responsibility and ownership of the different elements of such a plan, and how the members of the consultative board could play a constructive role in its development. The draft terms of reference were circulated as an agenda item and stakeholders asked to review and discuss internally in their respective organisations. Representatives of the following organisations were present at the workshop who agreed to become members of the consultative board: Department of Agriculture, Food and Marine, Co-BioEcon, University College Dublin, Irish Bioeconomy Foundation, Tipperary County Council, Gas Networks Ireland, Future Energy Ireland and InformBio Teagasc. With further interest from stakeholders who could not join us on the day but who are interested in joining our consultative board, we have now exceeded our target of 5 board members, which allows us much greater

flexibility to engage with members according to their availability at a given point in the Project when their input will be required.

The establishment of the consultative board means that we now have a team of committed experts from the bioeconomy sector whom the Irish partners in the ROBIN Project can call upon to share with us their knowledge and advice on the direction and development of our regional action plan. As the stakeholders were chosen through careful implementation of the quadruple helix methodology while aiming to ensure a positive gender mix of members, we believe that we have assembled a strong team of experts that will be of tremendous benefit to the Project going forward. Given that the sector in Ireland is small comparatively, many of the stakeholders are already known to and have worked previously with one another on different initiatives. This lends itself greatly to strengthening our ability to work collectively towards developing sectoral clustering and a regional strategy for the bioeconomy in the southern region.

More info

<https://robin-project.eu/robin-workshop-event-held-on-june-25th-2024-at-assembly-house-in-waterford-ireland/>



Support Action 3

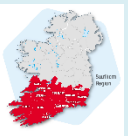
Engage with Local Authorities

The Southern Regional Assembly plays a significant role as the regional tier of government in Ireland in linking local and national policy goals through regional, spatial and economic planning. The Assembly has an oversight role in ensuring that local government development plans align with those of national government, and a representative role in participation in regional economic fora. In relation to the SRA’s role in the ROBIN Project, the key objective was to engage the local authorities in the region in co-creation and co-development of strategic governance policies. This is being achieved by means of regular contact between Assembly and in particular the Climate Action coordinators attached to the local authority. The responsible officers in the local authorities in the southern region have been kept informed of development regarding the work of the Project and invited to take part in co-creation and validation exercises.

In line with the strategic approach as outlined in the Bioeconomy Action Plan 2023-2025, to leverage bioeconomy cluster development, we are achieving progress in this regard through the involvement of representatives from two local authorities on our consultative board representing Limerick City & County Council and Tipperary County Council. Through consistent dialogue and communication with the local authorities, we have achieved buy-in to the goals of the ROBIN Project and established clearer communication channels to make progress on a regional bioeconomy strategy. The local government tier is well placed as a promoter of local enterprise and economic development to support sustainable and circular bioeconomy development at local level, with the support of the Southern Regional Assembly to integrate bioeconomy policy development into the regional and national planning frameworks. Discussions between the Southern Regional Assembly and the relevant government Departments and agencies as to the optimum means by which to advance this are ongoing in this regard. This support action has increased awareness of the bioeconomy as a planning priority area for the Southern Regional Assembly among the local authority sector. We have created clearer linkages between local, regional and national planning strategies.

Notably, as part of the Regional Spatial and Economic Strategy (RSES), which is the roadmap for effective regional government, there are defined regional policy objectives concerning decarbonization and support of various bioeconomy initiatives which are statutorily mandated to be reflected in the local authority Local Economic and Community Plans of the local authorities. This also promotes compliance between the RSES and the Bioeconomy Action Plan at a national level. In addition, the Assembly is involved in the development of a Smart Specialisation Strategy for the region and is centrally involved in UNESCO Learning Region initiatives, both of which will leverage the function of the local authorities to support education and enterprise development for the benefit of bolstering the continued development of the bioeconomy in the region.

	Support Action 4
	Bioeconomy Awareness Raising
<p>This action was completed on 31 January 2025 and aimed to engage communities, cities, and regions in increasing awareness of bioeconomy initiatives. This action aligned with the regional authorities' role in supporting the national Bioeconomy Action Plan 2023-2025. As part of Validation Action 5, a workshop focused on bioeconomy awareness and beta testing of the Knowledge Platform and Circular Bioeconomy Governance Model Canvas took place on 15 October 2024 during Bioeconomy Ireland Week in Waterford. The workshop, organized by SRA and MTU, involved participants being split into groups to provide feedback on aspects of the Circular Bioeconomy Model Canvas and the Policy Monitoring System. Feedback was shared at the end of each session, and participants also had the opportunity to complete a questionnaire on various elements of the tools.</p> <p>A key milestone from this action was the event titled "Towards 2030: Developing a Circular Bioeconomy Governance Model for our Communities, Cities, and Regions," which brought together 28 Irish bioeconomy stakeholders from various sectors, including government, industry, academia, and civil society. The event featured presentations from expert speakers on different bioeconomy aspects, sparking discussions on strategies to improve stakeholder networking and governance cohesion. These discussions provided valuable insights into overcoming obstacles in the development of bioeconomy strategies in Ireland. The event not only facilitated knowledge exchange but also contributed to the validation of the ROBIN project tools, especially the Canvas tool, which participants found beneficial as a planning tool for further advancing bioeconomy development.</p>	
More info	<u>Bioeconomy Ireland Week – Bioeconomy Ireland</u>

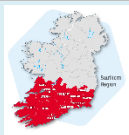
	Support Action 5
	Education Mapping
<p>The educational mapping action focused on identifying bioeconomy courses and mapping educational resources and infrastructure in the Southeast region of Ireland. In January, MTU conducted desk research to identify relevant courses, using a variety of data collection methods such as meetings with educational teams and data analysis tools. This led to the creation of an</p>	

internal database containing course details, such as names, providers, and locations, which were used to develop an educational data map.

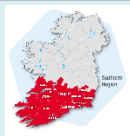
The process included a detailed timeline with key milestones such as contacting educational professionals, preparing presentations, and mapping the data, all scheduled for completion in early 2024. MTU collaborated with IKC3 to facilitate local outreach, data collection, and analysis, while IKC3 helped synthesize findings from the educational database.

The main outcome of this action is a comprehensive report published on 2 April 2024, which includes data on educational resources and recommendations for the region. The report is validated through stakeholder engagement via an online platform and includes key insights into educational gaps, workforce skills, and regional development. This initiative supports the regional Circular Bioeconomy Governance Model by promoting sustainable education, fostering economic growth, and enhancing social inclusion and environmental sustainability.

More info	Bioeconomy strategy chapter with database and map <u>Chapter-SA5 Comparative study on the Bioeconomy courses in Europe and bioeconomy structure event.pdf</u>
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	Support Action 6 Highlighting regional Bioeconomy Innovation
<p>This Support action aimed to identify and map bioeconomy innovations from businesses, research entities, and projects in the Southern region of Ireland. In February, MTU conducted desk research to identify relevant innovations, using various techniques such as website searches, reports, and project databases. This resulted in the creation of an internal database that includes key details about the innovations, such as names, providers, locations, and coordinates, which were used to develop an innovation data map.</p> <p>The action followed a clear timeline with key milestones: data collection starting in January, mapping the data by March, and finalizing the results by March 28, 2024. MTU, in collaboration with internal team members, played a central role in local outreach, data collection, and synthesis, providing expertise in database creation and mapping, as well as offering insights into gaps and recommendations.</p> <p>The main output of the action is a chapter in the working document for a bioeconomy strategy, complemented by a database and map. The chapter, finalized on April 2, 2024, presents key data on regional bioeconomy innovations and will help the SRA identify ongoing bioeconomy activities and key stakeholders for engagement. Indicators of success include the database and the map, which facilitate easier visualization and analysis of regional innovations.</p> <p>This initiative supports the regional Circular Bioeconomy Governance Model by promoting sustainable solutions, resource management, and waste valorization. It fosters innovation, attracts investment and talent, and creates job opportunities, enhancing the region's reputation for sustainability and innovation. Ultimately, it contributes to economic growth, social well-being, and environmental sustainability, positioning the region as a leader in the bioeconomy sector.</p>	
More info	Bioeconomy strategy chapter, database, map

[Chapter_SA6_Bioeconomy Innovation in SR Ireland.pdf](#)



Support Action 7

Biomass quantification

The biomass quantification action aimed to identify and map available biomass resources in the Southern region of Ireland, focusing on cereals, forest and energy crops, and slurry and pasture biomass. In February and March, MTU conducted desk research using various literature sources and reports to compile a biomass feedstock database. The data was then quantified and mapped using QGIS software, detailing biomass quantities and their locations at the county level, which was used to create a biomass arising data map.

The action followed a structured timeline with key steps: data collection starting in January, data summarization in February, and mapping in March, with the final results reviewed by March 28, 2024. MTU, in collaboration with internal team members, led the data collection, analysis, and synthesis, providing expertise in database management and mapping.

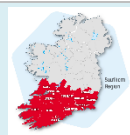
The primary output of the action is a 9-page chapter in the working document for a bioeconomy strategy, finalized on 2 April 2024, which includes a comprehensive database and maps. This chapter presents key data on biomass resources in the region and offers recommendations. It serves as the first summary report of its kind for the SRA, helping to identify biomass opportunities with potential for scaling in the region.

This initiative supports sustainable bioeconomy planning by providing accurate biomass data that can drive economic growth, diversify energy sources, and promote environmental sustainability. It aligns with the regional Circular Bioeconomy Governance Model by optimizing biomass in circular value chains, improving resource efficiency, and fostering territorial development through biomass-based infrastructure and value-added products. Ultimately, it contributes to regional prosperity and sustainability.

More info

Bioeconomy strategy chapter, database, map

[Chapter_SA7_Biomass quantification in Southern Region of Ireland.pdf](#)



Support Action 8

Bioeconomy Funding assist

This action was completed on 29 January 2025 and aimed to explore funding mechanisms and opportunities for bioeconomy research, implementation, and scaling up projects in the southern region of Ireland. The research for this action involved an extensive desk-based review of existing funding opportunities at the EU, national, and regional levels, carried out by the Southern Regional Assembly (SRA). The review highlighted funding streams in which the SRA plays a role, such as Interreg Europe, Interreg North West Europe, and Horizon Europe, and identified underutilized funding streams that could benefit stakeholders. Additionally, a bioeconomy awareness and beta testing workshop was held in Waterford during Bioeconomy Ireland Week in October 2024, where Liz Gavin from NuaFund presented on EU funding opportunities for the Irish bioeconomy.

A key milestone of this action was the creation of a 12-page chapter that will be included in a framework document for the governance of the bioeconomy in the southern region. The research efforts were enhanced by the cooperation of MTU and stakeholders who attended validation workshops of the ROBIN tools. These workshops provided an opportunity to discuss funding mechanisms for the bioeconomy, alongside the validation of the Knowledge Platform and Canvas tools. The support action's implementation has significantly raised awareness of the available funding mechanisms that can help strengthen research, development, and innovation (RD&I) and facilitate the scaling up of bioeconomy projects. It also highlighted the various forms of support the SRA can offer, including assistance with accessing EU funding, finding consortium partners for EU projects, and writing successful project proposals. Through its involvement as a Managing Authority of the ERDF Southern, Eastern, and Midland Regional Programme 2021-2027 and as a contact point for Interreg Europe and Interreg North-West Europe, the SRA is well-positioned to promote this support action and deliver substantial support to researchers and SMEs working in the bioeconomy sector in the southern region.

To this end, the completion of this action and spotlighting of available supports addresses the prominence given to the issue of funding as a barrier to bioeconomy development identified by workshop participants during SWOT analysis in D2.1.

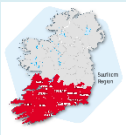


Support Action 9

Evaluate Governance Structures and policies

This action began with relevant research in July 2024 and was completed on 4 February 2025. The Southern Regional Assembly (SRA) reviewed the most suitable governance structures and policies from Deliverables 1.2 and 1.3 to determine the most relevant ones for the Southern Region of Ireland, considering the specific policy, systemic, and legislative factors unique to the Irish context. The Typology Framework and Knowledge Platform were particularly beneficial as resources in guiding the research process.

The key output of this support action was a chapter in a report jointly published by SRA and MTU, which focused on developing an action plan for the bioeconomy in the southern region of Ireland. This action provided valuable insights into effective governance models and practices used in other regions that have successfully developed bioeconomies. These examples will help Irish policymakers replicate or adapt these practices, offering a useful reference to inform and shape bioeconomy policies in the Southern Region, further supporting the region's transition towards a circular bioeconomy.



Support Action 10

Examination of existing policies, strategies

The Southern Regional Assembly (SRA) commenced an in-depth desk-based research project in March 2024, focusing on policies and strategies that influence Ireland’s bioeconomy. This research not only examined existing frameworks but also identified legislative mandates that must be integrated into a forthcoming regional action plan for the bioeconomy in Ireland’s Southern Region. The study was finalized in July 2024, and its findings will be consolidated into a dedicated chapter within the Southern Region’s bioeconomy regional action plan. The methodology involved systematically identifying key (i) policies and (ii) strategies relevant to bioeconomy development, categorizing them in a structured manner, and analyzing them at different governance levels—ranging from the European Union down to national, regional, and local government perspectives.

A significant milestone of this initiative is the publication of a comprehensive chapter within the Southern Region bioeconomy action plan. This chapter, expected to span approximately 15 pages upon final editing, encapsulates the research findings conducted by the SRA. It serves as a crucial reference document, providing an organized and thorough assessment of policies and strategies that shape the region’s bioeconomy landscape.

The research and subsequent publication will function as a key resource for policymakers and practitioners, offering insights into the legislation, regulations, and best practices underpinning each identified strategy and policy. By systematically assessing existing guidelines and recommendations, this study supports the broader objectives of the validation plan and aligns with the Southern Region’s vision for a regional circular bioeconomy. Furthermore, it provides a foundation for evaluating whether current policies are being effectively implemented and highlights opportunities for future improvements in policy development and strategic planning.

3.2. Validation actions


This section provides a list of validation actions implemented in each ROBIN region, along with a detailed description of their approach and outcomes.

3.2.1. Andalusia (ES)

The following validation actions took place in Andalusia (Table 6). More information about each validation action is provided below.

Table 6: Validation actions in Andalusia

	Validation actions	Tools/ functionalities	Validation period	Month of completion
1	<i>Multi-tool validation workshop</i>	Knowledge platform, Support Action Portfolio, CBGMC	Alpha testing	M19 March 2024
2	<i>Policy tool validation workshop</i>	Policy tool	Alpha testing	M22 June 2024
3	<i>Hands-on testing of environmental tool</i>	Environmental Protection Planning (EPP) tool	Alpha testing	M21 May 2024
4	<i>B-team validation workshop</i>	CBGMC	Beta testing	M31 March 2025

	Validation Action 1
	Multi-tool validation workshop
<p>This validation action was planned as a pathway using the three toolbox components sequentially: (1) Knowledge Platform for strategical inspiration, (2) Support Actions Portfolio for operational inspiration (focused on potential activities to be included in the CANVAS) and CBGMC as the key operational tool for the identification of key elements. All the work was done in advance by the regional node (including a prefilling of the CBGMC), to be able to guide the workshop audience properly and efficiently during the 2-hour event. The Knowledge Platform and the Support Actions Portfolio were used online (through the available online version of the ROBIN Toolbox) while the CBGMC was downloaded, prefilled, and presented. CTA led the event, but CAP and IFA supported CTA both in the event preparation (including review of presentations and materials) and during the event celebration, contributing as regional experts in the bioeconomy but also communication fields.</p> <p>This validation workshop was planned as a pathway using the three toolbox components sequentially: (1) Knowledge Platform for strategical inspiration, (2) Support Actions Portfolio for operational inspiration (focused on potential activities to be included in the CANVAS) and CBGMC as the key operational tool for the identification of key elements. All the work was done in advance by the regional node (including a prefilling of the CBGMC), to be able to guide the workshop audience properly and efficiently during the 2-hour event. The Knowledge Platform and the Support Actions Portfolio were used online (through the available online version of the ROBIN Toolbox) while the CBGMC was downloaded, prefilled, and presented. CTA led the event, but CAP and IFA supported CTA both in the event preparation (including review of presentations and materials) and during the event celebration, contributing as regional experts in the bioeconomy but also communication fields.</p> <p>With this workshop, three of the ROBIN Toolbox components were tested with 17 MARC and regional experts (alpha testing level). The event was held as a satellite event in the framework of a national reference event on knowledge transfer and innovation (TRANSFIERE) hosted in Málaga (Andalusia) on the 21 March 2024. The results of the information gathered in the CBGMC were used for the development of a full report on key elements to be considered in the design and</p>	

implementation of an awareness raising campaign towards civil society that the region could use in the future (Regional Support Action nº9).



More info

<https://robin-project.eu/robins-andalusian-team-held-its-first-robins-toolbox-validation-session-in-transfiere-2024/>



Validation Action 2

Policy tool validation workshop

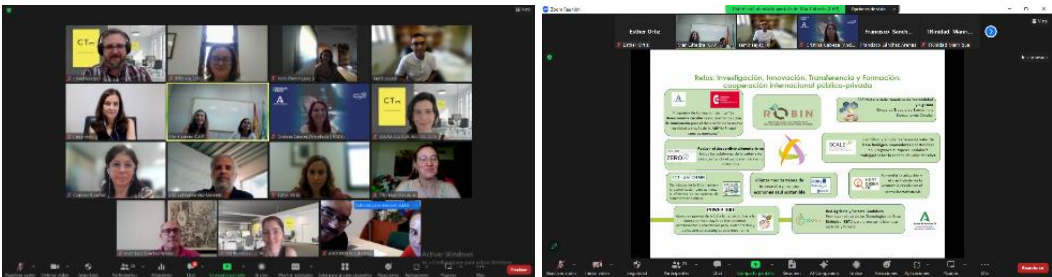
The Policy Monitoring Tool (PMT) was validated through an alpha testing workshop held on 25 June 2024, involving a diverse group of participants from different sectors. The session brought together experts from CAP, IFA, CTA, and Andalusian MARC, all of whom contributed their specific expertise to ensure a comprehensive evaluation.


From CAP, participants included professionals from the Studies and Statistics Service, the Agri-food Innovation and Digitalization Service, and the Prospective Unit of the Agriculture and Fisheries Management Agency of Andalusia. These individuals provided valuable insights on the agricultural and food policy landscape in Andalusia. IFA participants came from fields such as agro-industry, food quality, and agri-food engineering, bringing their knowledge of the sector's technological and economic aspects.

CTA contributed experts from their Consultancy and International Projects departments, who specialize in supporting public administration and developing regional strategies. They also brought in those with experience in developing similar tools and collaborating with other EU regions on tool replication.

Members of the Andalusian MARC, representing the quadruple helix model (agri-food value chain, society, academia, and public administration), ensured that the session reflected a broad range of perspectives.

In total, 33 experts participated, with 29 providing feedback during the alpha testing phase. Their input, collected through a customized feedback form, will be used to refine the PMT for future use and potential replication.





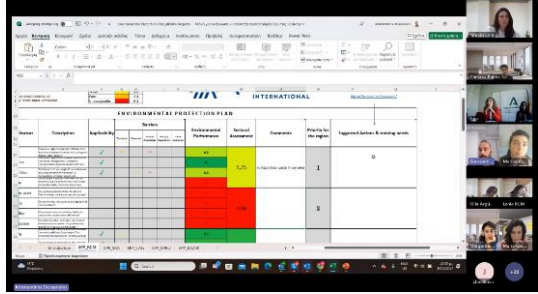

Validation Action 3


Hands-on testing of environmental tool

The Environmental Protection Planning Tool (EPP) underwent alpha testing through a training session organized on 15 May 2024 for a selected team of participants from Andalusian partners (CAP, IFA, CTA), none of whom were directly involved in the ROBIN activities. The session, led by Q-Plan (the tool owner), provided an opportunity for participants to familiarize themselves with the EPP and address any questions or concerns. The training aimed to ensure a multi-actor, multi-sectoral approach by involving experts from various fields.

CAP invited participants from departments such as the Studies and Statistics Service, Agri-food Innovation and Digitalization Service, and the Prospective Unit of the Agriculture and Fisheries Management Agency of Andalusia. IFA contributed experts from agro-industry, food quality, and technology, as well as the Regional Ministry of Sustainability, Environment, and Blue Economy. CTA invited professionals with experience in supporting public administrations, developing regional strategies, and creating similar tools, ensuring that the session included diverse perspectives.

A total of 24 Andalusian experts participated in the alpha testing, including 9 from the administration team and 15 from the testing team. After the session, a customized feedback form was distributed to gather insights, which were forwarded to the ROBIN project team for further improvements. This validation action marked a significant step in refining the EPP, ensuring it aligns with regional needs and can be effectively utilized in future phases.





Validation Action 4

B-team validation workshop

This action took place during a workshop on 13 March 2025, in Malaga, as part of the national TRANSFIERE Forum, a key event on knowledge transfer and innovation. The goal of the workshop was to identify a potential public-private cooperation structure and explore synergies between different Spanish regions using the Circular Bioeconomy Governance Model Canvas (CBGMC). Participants from three external regions—Catalonia, Madrid, and Castilla y León—helped validate the tool, while Andalusian ROBIN MARC members and regional experts provided feedback on a potential public-private partnership structure for Andalusia.

The event featured presentations from representatives of all participating regions, sharing their regional governance models and public-private partnership structures. This allowed for a mutual exchange of learning and experiences. Participants used the CBGMC tool to focus on key areas

such as activities, partnerships, resources, regional vision, and communication channels. The workshop concluded by identifying potential synergies between the regions, which will help inform future collaborative efforts in the circular bioeconomy.

A key milestone of the workshop was the validation of the ROBIN CBGMC tool, with feedback collected from three external regions (beta testing), 9 administration team members, and 16 Andalusian MARC members and regional experts (alpha testing). The information gathered contributes to a repository for benchmarking the potential structure of a circular bioeconomy node at the regional level. A feedback form was also distributed to participants to gather further insights for improving the tool after the beta testing phase.



More info

<https://robin-project.eu/robin-stakeholder-engagement-workshop-at-transfiere-forum-spain/>

3.2.2. Central Macedonia (EL)


The following validation actions took place in Central Macedonia (Table 7). More information about each validation action is provided below.

Table 7: Validation Actions in Central Macedonia

	Validation actions	Tools/ functionalities	Validation period	Month of completion
1	<i>Hands-on testing EPP</i>	Environmental Protection Planning (EPP) tool	Alpha testing	M22 June 2024
2	<i>Hands-on testing PMS</i>	Policy Monitoring System (PMS) tool	Alpha testing	M22 June 2024
3	<i>Alpha Validation Workshop</i>	CBGMC; Support Actions portfolio	Alpha testing	M21 May 2024
4	<i>Alpha Online Survey</i>	Knowledge platform (models & practices); Tools (CBGMC, PMS & EPP); Support Actions portfolio	Alpha testing	M23 July 2024
5	<i>Beta Validation Workshop</i>	CBGMC; Support Actions portfolio	Beta testing	M30 February 2025
6	<i>Beta Online Survey</i>	Knowledge platform (models & practices); Tools (CBGMC, PMS & EPP); Support Actions portfolio	Beta testing	M30 February 2025

Validation Action 1 & 2

	<h3>Hands-on testing EPP and PMS</h3>
<p>The validation of the Environmental Protection Planning (EPP) and Policy Monitoring System (PMS) tools involved collaboration with key environmental stakeholders. Our outreach efforts were successful, leading to a productive meeting on 7 June 2024, with a range of experts from several regional environmental bodies. The meeting included participants from the Solid Waste Management Body of Central Macedonia, the Municipal Water & Sewerage Company of Themi, the Development & Environment Directorates of Thessaloniki and Pieria, the Department of Environmental & Spatial Planning (Decentralized Administration of Macedonia & Thrace), the Directorate of European Programs & Synergies, and the Department of Industry, Energy & Natural Resources. Ten people attended, including the Deputy Regional Governor for Development & Environment.</p> <p>The participating regional entities contributed valuable insights from their respective areas. The Solid Waste Management Body shared expertise in waste management, while the Municipal Water & Sewerage Company provided insights into water management. The Development & Environment Directorates contributed knowledge on regional development, and the Department of Environmental & Spatial Planning offered expertise in solid, air, and water management. The Directorate of European Programs & Synergies facilitated program alignment, and the Department of Industry, Energy & Natural Resources contributed discussions on industrial, energy, and natural resource management.</p> <p>The validation workshop took place at the Central Macedonia Regional Government building, lasting 3.5 hours, and included 10 attendees. The session resulted in positive feedback, with participants expressing support for the tools and offering valuable recommendations for improvement. The successful collaboration and insights gained from the workshop mark a key milestone in refining the tools for future use.</p>	
	

	Validation Action 3
	Alpha Validation Workshop
<p>This Validation action, as part of the "Stakeholder Engagement: Academia" support action, was held on 29 May 2024. Organized by AUTH with support from regional node members, the event aimed to gather feedback from local academic stakeholders, as well as representatives from government, business, and civil society institutions. The workshop focused on presenting the Bioeconomy Governance Model Canvas and the Support Action Portfolio, both developed in earlier phases of the ROBIN project, and sought feedback on their academic robustness and potential to support regional bioeconomy promotion. The event was attended by 21 participants,</p>	

representing diverse profiles such as members of the scientific community, policy makers and industry members. Promotion of the event included a mix of email invitations, direct networking as well as engaging AUTH's media offices for the dissemination of the event. Finally, posters for the event and flyers were created and an agenda for the event was developed. AUTH prepared and presented the toolbox components during the workshop, moderating discussions and ensuring active engagement from the 21 participants. These included 9 female and 12 male attendees from various fields, such as the scientific community, policy-making, and industry. Promotion of the event included email invitations, direct networking, media outreach, and the distribution of posters and flyers to maximize participation. Following the workshop, AUTH distributed an online feedback questionnaire to all participants, analyzing the results to provide insights for refining the tools. The key milestone was the compilation of the findings into a report, which will inform any necessary adjustments to the Bioeconomy Governance Model Canvas and Support Action Portfolio before the beta testing phase. The report was shared with the regional node and task leaders to guide improvements.



More info

<https://labgeo.plandevol.auth.gr/robin-stakeholders-engagement-event-academia-in-thessaloniki-greece/>



Validation Action 4

Alpha Online Survey

This validation Action was conducted to evaluate the usability of the ROBIN toolbox components, including the Knowledge Platform, Bioeconomy Governance Model Canvas, Policy Monitoring System Tool, Environmental Protection Planning Tool, and Support Actions Portfolio. The survey focused on measuring the user experience with the Toolbox through the website. After the Alpha Validation Workshop, AUTH, supported by the regional node, distributed the online survey to local stakeholders, including their teams, MARC members, and workshop participants. The responses were analyzed and shared with the regional node and task leader. The survey gathered input from 26 participants with diverse backgrounds, including regional node teams, MARC members from Central Macedonia, workshop participants, and stakeholders from academia, government, business, and civil society. To ensure wide participation, the survey was promoted through email invitations and direct networking by regional node members. The key milestone of this validation action was the compilation of survey findings into a report, which informed any necessary adjustments to the toolbox components. The feedback gathered guided improvements to the Knowledge Platform, Bioeconomy Governance Model Canvas, Policy Monitoring System Tool, Environmental Protection Planning Tool, and Support Actions Portfolio in preparation for the beta testing phase.

	Validation Action 5
	Beta Validation Workshop
<p>The Beta Testing Validation Workshop was held on 27 February 2025, in Thessaloniki and was organized by the Region of Central Macedonia in collaboration with the Aristotle University of Thessaloniki (AUTH). This action aimed to strengthen regional governance models for Circular Bioeconomy. The event served as a platform to introduce and evaluate the ROBIN Toolbox. The workshop featured a structured agenda, beginning with presentations from key regional representatives, including Dr. Vlachos Nicolaos and Ms. Anthoula Papadopoulou, who provided insights into the significance of Circular Bioeconomy and ROBIN's objectives. Mr. Alexandros Skondras (AUTH) conducted a detailed demonstration of the ROBIN Toolbox, showcasing its core components such as governance models, strategic tools, and policy monitoring mechanisms. The event also included discussions on best practices, stakeholder engagement sessions, and the groundwork for establishing a Regional Bioeconomy Cluster, led by Mr. Christos Politis (Q-PLAN).</p> <p>The workshop successfully brought together stakeholders from five regions—Central Macedonia, Central Greece, Thessaly, Western Macedonia, and Western Greece—along with representatives from academic institutions, municipalities, and research centers. Fifty (50) stakeholders attended the event and engaged in in-depth discussions on best practices, policy integration, and strategic collaborations for enhancing Circular Bioeconomy. A key milestone was the collection of feedback on the ROBIN Toolbox usability, which will be instrumental in refining its functionalities. Additionally, the event fostered interregional cooperation and initiated discussions on the formation of a Regional Bioeconomy Cluster, paving the way for long-term collaboration among key actors in the sector. A detailed summary of the insights gathered during the workshop was compiled into a final report for further development and implementation.</p> <p>The workshop played a crucial role in advancing the Circular Bioeconomy strategy in the Region of Central Macedonia and beyond. By facilitating dialogue among diverse stakeholders, it strengthened regional cooperation and laid the foundation for the sustainable integration of ROBIN's tools into regional governance models. The insights gathered enhanced the Toolbox' effectiveness, ensuring its adaptability to real-world bioeconomic challenges. Moreover, the establishment of a Regional Bioeconomy Cluster represents a significant step towards fostering cross-sector collaboration, innovation, and investment in Circular Bioeconomy initiatives.</p>	
	
More info	https://robin-project.eu/beta-testing-validation-workshop-region-of-central-macedonia/

	Validation Action 6
	Beta Online Survey

This action was completed on 19 March 2025 as part of the ROBIN project's beta testing phase. The survey focused on assessing the usability of the ROBIN toolbox components, including the Knowledge Platform, Bioeconomy Governance Model Canvas, Policy Monitoring System Tool, Environmental Protection Planning Tool, and Support Actions Portfolio. AUTH developed and shared the online survey with local stakeholders, including team members, the external beta testing team, and participants from the Beta Validation Workshop. After collecting responses, AUTH analyzed the results and shared them with the regional node and task leader.



The key milestone for this validation action was the compilation of survey findings in an Excel format, based on feedback from 12 participants representing a variety of sectors, including the scientific community, government, business, and civil society. These findings will inform the final improvements and changes to the ROBIN toolbox components. The survey was promoted through email invitations and direct networking by regional node members, ensuring diverse participation from local stakeholders. The feedback collected helped in the refinement of the tools, enhancing their functionality in the final phases of the project.


3.2.3. *Baden-Württemberg (DE)*


The following validation actions took place in Baden-Württemberg (Table 8). More information about each validation action is provided below.


Table 8: Validation Actions in Baden-Württemberg


	Validation actions	Tools/ functionalities	Validation period	Milestone	Month of completion
1	<i>First Validation Workshop</i>	CBGMC	Alpha testing	Workshop	M23 July 2024
2	<i>First Knowledge Platform Validation</i>	Knowledge Platform	Alpha testing	Report	M20 April 2024
3	<i>Environmental Tool Validation</i>	Environmental Tool	Alpha testing	Survey	M19 March 2024
4	<i>Policy Tool Validation</i>	Policy Tool	Alpha testing	Survey	M22 June 2024
5	<i>First Support Action Portfolio Validation</i>	Support Action Portfolio	Alpha testing	Report	M23 July 2024
6	<i>Second Support Action Portfolio Validation</i>	Support Action Portfolio	Alpha testing	Report	M23 July 2024
7	<i>Second Knowledge Platform Validation</i>	Knowledge Platform	Alpha testing	Report	M24 August 2024
8	<i>Validation Meeting</i>	Support Action Portfolio	Alpha testing	Workshop	M24 August 2024
9	<i>PMS Tool Validation</i>	PMS	Beta testing	Workshop	M30 February 2025

	Validation Action 1
	First Validation Workshop
<p>Validation Action 1 was combined with the implementation of Support Action 8. The Alpha testing for the Circular Bioeconomy Governance Model Canvas (CBGMC) focused on identifying gaps in funding schemes related to the bioeconomy. S2i analyzed the results of the WP2 workshop and developed a concept for a follow-up workshop and survey targeting companies involved in bioeconomy projects in Baden-Württemberg. The workshop included presentations on the ROBIN project and the ShapingBio project's work on bioeconomy funding. Following the presentations, the results of the survey were shared with the 10 participants, who then engaged in several interactive sessions.</p> <p>The workshop consisted of four main sessions: an open group discussion on the strengths and weaknesses of the funding landscape in Baden-Württemberg; a snowball brainstorming session to generate ideas for improving access to funding; a ranking of those ideas using the How, Now, Wow Matrix; and the development of the two most popular ideas using the CBGMC.</p> <p>Key milestones included conducting a survey with 36 companies, receiving 6 responses, and hosting the workshop on 18 July 2024, in Stuttgart with 10 stakeholders from academia, business, policy, and civil society. The event was promoted via LinkedIn posts by S2i and ROBIN, and the results were compiled into a report for further analysis.</p> <div data-bbox="344 1012 1246 1366">  </div>	
More info	https://tinyurl.com/4e2v9m9f

	Validation Action 2
	First Knowledge Platform Validation
<p>The work on this action was structured into three key steps: identifying target groups already included in the Baden-Württemberg Bioeconomy Strategy, using the Knowledge Platform to identify additional target groups, and preparing a summary report. S2i led the process, comparing the target groups from the Baden-Württemberg strategy with those from the 20 governance models included in the Knowledge Platform.</p> <p>As a result, four new target groups were identified. The methodology and findings were compiled into a comprehensive 14-page report summarizing the entire process and its outcomes (see SA4).</p>	

	Validation Action 3 & 4
	Validation of Environmental Protection Planning Tool & Policy Monitoring System Tool
<p>These actions included the validation of the Environmental Protection Planning Tool (EPPT) along with the Policy Monitoring System Tool (PMS).</p> <p>The validation procedure was carried out in three steps:</p> <p>First, a use case was formulated. Next, an internal meeting was held to test the tool's implementation, involving two team members - one familiar with the tool and one who was new to it. Finally, the tool and results were shared with a representative from the Baden-Württemberg Ministry of the Environment for additional feedback.</p> <p>The key milestone of this validation action was the input of all feedback into the ROBIN internal toolbox validation tool, with the final report prepared for further review and analysis.</p>	
More info	<i>ROBIN - Internal Toolbox Validation Tool (office.com)</i>

	Validation Action 5
	First Support Action Portfolio Validation
<p>The validation of the 1st Support Action Portfolio focused on identifying education-related support actions. Five such actions were found, and an action plan was developed for Support Action 5, which aimed at identifying gaps in the education sector related to the bioeconomy.</p> <p>This plan included desk research, database development, surveys, interviews, and report.</p> <p>The key milestone was the preparation of a report based on the experience, with all feedback entered into the ROBIN internal toolbox validation tool.</p>	
More info	<i>Report SA5 final</i>

	Validation Action 6
	Second Support Action Portfolio Validation
<p>The validation of the 2nd Support Action Portfolio focused on identifying gaps in the communication material for civil society in Baden-Württemberg.</p> <p>For this purpose, the ROBIN Support Action Portfolio was screened for all Support Actions relating communication material, bioeconomy awareness raising and civil society. The identified actions were used to develop an action plan for the implementation of the Support Action 6.</p> <p>This plan included desk research, database development, exchange with experts and stakeholders, analysis of results and preparation of a report. This report contains an analysis of the current state of the communication material for civil society as well as recommendations for actions that could further strengthen it.</p>	

We identified 4 main gaps or areas of intervention: 1) accessibility, 2) Awareness, 3) Engagement and interactivity and 4) Relevance to everyday life. For each area, we suggest actions to be taken.

More info [SA6_Report_final.pdf](#)



Validation Action 7

Second Knowledge Platform Validation

The work on this action was structured into three key steps:

Step 1 involved reviewing the platform for Good Practices related to communication materials for civil society, with one relevant practice identified.

Step 2 focused on developing an action plan for SA7, aimed at informing civil society about bioeconomy. This included desk research, updating the database from VA6, identifying regional representatives for exchange, preparing discussion questions, conducting bilateral exchanges, and drafting a report. The findings were merged in the SA6 report.



Validation Action 8

Validation Meeting

The work on this action was structured along the following steps:

Step 1 involved reviewing the portfolio to identify measures related to matchmaking and networking opportunities, with five relevant measures found.


Step 2 focused on developing an action plan for SA3 (Creation of more matchmaking opportunities between stakeholders around the same topic), aimed at creating more matchmaking opportunities between stakeholders on shared topics. This included desk research to create a database of existing bioeconomy networks, initiatives, and clusters in Baden-Württemberg, followed by exchanges with experts to explore further opportunities for matchmaking. Results were synthesized in a database that includes 9 initiatives, 8 networks & clusters and 8 projects.

The final step foresaw the organization or participation in a network meeting with experts on the identified topics. This was not done for the following reasons:

- 1) Our partner BIOPRO, that played a key role in the support of networks in the field of bioeconomy, withdrew from the ROBIN project due to a thematic reorientation (away from bioeconomy). SEZ lacked (personal) contacts and thematic expertise to credibly launch a new network.
- 2) S2i had planned to attend a meeting of the initiative Phytopharmaka or Vertical Farming (under leadership from BIOPRO) but their reconversion led to organizational turmoil so that such meetings could not take place.
- 3) Our analysis as well as exchange with experts confirmed that actors in Baden-Württemberg are already well connected – even without participating in formal networks.

Hence, it is not clear what would be the real added value of creating a new network. On the contrary, waste of time was mentioned as a clear drawback of such idea.

- 4) The existence of specialist events aiming at facilitating networking and knowledge exchange on current bioeconomy topics including the Baden-Württemberg Bioeconomy Congress that is organized every two years as a cross-sector event provide enough occasion to address the identified topics.

	Validation Action 9
	PMS Tool Validation
<p>This action focused on the testing and validation of the Policy Monitoring System (PMS) tool. The implementation process involved several key steps. First, regions with established bioeconomy strategies, including the Podravje region in Slovenia, BioBall in Hessen, and Bayern in Germany, were identified. Additionally, regions in the process of developing strategies, such as BioökonomieREVIER in North-Rhine-Westphalia and the Alb-Danube District in Germany, were also included. Following this, a workshop was organized with relevant stakeholders from these regions to test and validate the PMS tool. This step aimed to gather valuable feedback on the tool's functionality and usability.</p> <p>Once the workshop was conducted, the feedback was carefully analyzed and entered into the ROBIN internal toolbox validation tool, along with the results from a feedback questionnaire distributed to external stakeholders. This comprehensive process provided insights into the tool's effectiveness and areas for improvement.</p>	
More info	https://robin-project.eu/robins-stakeholder-engagement-event-in-baden-wuerttemberg/

3.2.4. Žilina Region (SK)


The following validation actions took place in Žilina Region (Table 9). More information about each validation action is provided below.

Table 9: Validation Actions in Žilina Region

	Validation actions	Tools/ functionalities	Validation period	Milestone	Month of completion
1	<i>First Validation Workshop</i>	Knowledge platform, Support Action Portfolio, CBGMC	Alpha testing	Workshop	M21 May 2024
2	<i>Internal Validation Meeting</i>	Support Action Portfolio	Alpha testing	MARC meeting	M23 July 2024
3	<i>First Function and Content Validation</i>	EPP, PMS	Alpha testing	Internal meeting	M23 July 2024
4	<i>Meeting Žilina Self-governing region representatives</i>	EPP, PMS	Alpha testing	Workshop	M23 July 2024

5	<u>Second Validation Workshop</u>	CBGMC, Support actions portfolio	Beta testing	Workshop	M28 December 2024
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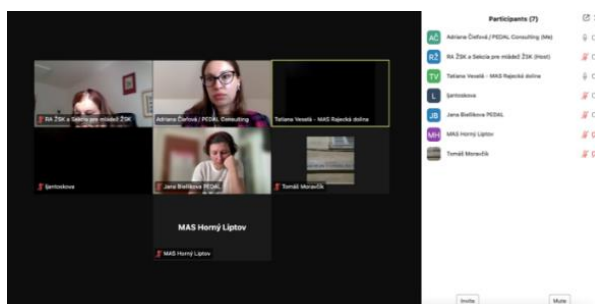
	Validation Action 1
	First Validation Workshop
<p>This validation action included the alpha testing phase for the Support Actions Portfolio. A workshop focused on the "Regional Analysis of the Development of Bioeconomy in the Žilina Region" was conducted. This workshop, organized by PED and ZSK, introduced the ROBIN Toolbox and Support Actions Portfolio, followed by a presentation of the Regional Analysis by experts. The Žilina Region, which lacks a Bioeconomy Strategy and dedicated analysis, used this session to gather relevant data to support informed decision-making. The discussion with stakeholders covered the current opportunities, challenges, and barriers in bioeconomy development.</p> <p>The selection of specific Support Actions from the Portfolio aimed to collect essential data on bioeconomy potential, including biomass sources, key actors, and funding schemes, to guide future decisions on bioeconomy priorities. The workshop was attended by 16 stakeholders, including representatives from the Žilina Self-Governing Region, MARC members, and local clusters, NGOs, and agencies.</p> <p>A key milestone was the distribution of a questionnaire on the ROBIN Toolbox and the Regional Analysis, with 10 participants providing feedback. All respondents agreed that the Analysis could enhance stakeholder involvement in governance model creation, was accurate and up-to-date, and recommended its use to colleagues. This validation action also encompassed Support Actions 1-8, as the presented Analysis addressed most of the region's defined Support Actions.</p>	
	
More info	https://robin-project.eu/development-of-bioeconomy-in-the-zilina-region/

	Validation Action 2
	Internal Validation Meeting
<p>This validation action took place in the context of the alpha testing phase for the Knowledge Platform and Circular Bioeconomy Model Canvas (CBMC). It included an online workshop where the toolbox components were presented and discussed in relation to the "Regional Analysis of the Development of Bioeconomy in the Žilina Region." The workshop, organized by PED and ZSK,</p>	

detailed the functionality of the tools and led a discussion on the findings from the initial validation meeting.

The stakeholders found the toolbox components inspiring and practical, though they requested more detailed descriptions and real-life examples, especially for best practices in the Knowledge Platform (KP) and for using the Circular Bioeconomy Model Canvas (CBMC) in everyday operations. The discussion also covered next steps based on the findings of the Regional Analysis.

The workshop, held on 4 July 2024 via Zoom, was attended by five key MARC members from the Žilina region. The main feedback highlighted the need for more best practices, particularly from nearby regions like Central Europe, and real-world examples of CBMC usage. This validation action also covered Support Actions 1-8, as the Regional Analysis addressed many of the region's bioeconomy development priorities.



Validation Action 3

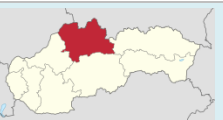
First Function and Content Validation

This validation action took place in the context of the alpha testing phase. The Policy Monitoring Tool and Environmental Protection Tool were validated by the regional nodes, PED and ZSK, in an internal function and content validation session. The goal was to test and understand the tools' functionalities, ensuring the regional nodes could effectively explain their applicability and benefits to stakeholders, especially in preparation for the upcoming Validation Action 4 – the Meeting with the Representative of the Žilina Self-Governing Region.

The regional nodes recognized the tools as valuable for policy planning, data analysis, and structuring activities, ultimately helping to define precise policies. However, they noted the tools' complexity, which could pose challenges for local municipalities with limited staff. To achieve the desired outcomes and facilitate the transition to a circular bioeconomy, local governments would need expertise from external sectors like academia or consulting.

The internal validation took place online via Zoom on 8 July 2024, with 2 PED members and 1 ZSK member participating. This session also incorporated Support Action 10, focused on the validation of the Policy Monitoring Tool and Environmental Protection Tool.

No photos were taken during this internal validation activity.



Validation Action 4

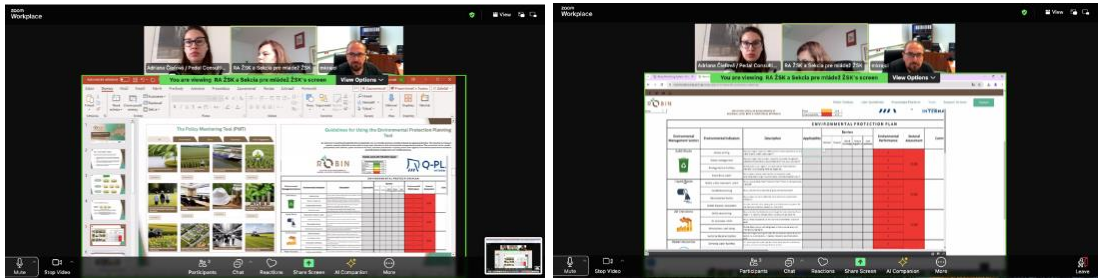
Meeting Žilina Self-governing region representatives

This validation action took place in the context of the alpha testing phase. The ROBIN Toolbox, including the Policy Monitoring Tool (PMT) and Environmental Protection Tool (EPT), was presented to Mr. Matúš Krajčí, the Director of the Department of Regional Development of the Žilina Self-Governing Region. The presentation, led by ZSK and PED, aimed to introduce the tools to municipalities that currently do not use similar systems. The goal was to identify towns or villages willing to test the Toolbox, creating concrete examples that could inspire other municipalities to adopt it.

Following the presentation, a discussion was held to outline the next steps. Mr. Krajčí recognized the potential of the Toolbox and committed to identifying municipalities that would use it on a long-term basis, promoting its broader adoption.

Key feedback included suggestions for the PMT to offer more interactive instructions and for the EPT to be simplified with clearer usage guidelines. These insights will help improve the tools' usability. This validation action also encompassed Support Actions 6 and 10, which focus on building relationships with stakeholders and validating the toolbox components.

The meeting took place online via Zoom on 22 July 2024, marking a significant milestone in the validation process.



Validation Action 5

Second Validation Workshop

The workshop held on 4 December 2024, titled "Together for the Slovak Bioeconomy," was a key validation action for the ROBIN Toolbox, focusing on the Circular Bioeconomy Governance Model Canvas and the Support Actions Portfolio. The event, organized by PED in collaboration with ZSK, took place at the Žilina Self-Governing Region. During the workshop, the updated version of the ROBIN Toolbox, including these two components, was presented, alongside the findings of the "Regional Analysis of the Development of Bioeconomy in the Žilina Region." The workshop featured presentations from two external regions—Banská Bystrica and Trenčín—which highlighted their current bioeconomy development, successful pilot projects, and future plans. In addition, the Mutual Learning Session provided a platform for stakeholders from the Žilina, Prešov, and Nitra regions to exchange best practices and ideas, fostering cooperation for accelerating the transition to circular bioeconomy in Slovakia.

A significant milestone from the workshop was the active participation of 36 stakeholders, representing both the Žilina region and the four external regions, including Banská Bystrica, Trenčín, Prešov, and Nitra. This diverse group contributed valuable insights during the Mutual Learning Session and informal discussions, enriching the exchange of knowledge and collaboration opportunities. The validation action was further supported by the inclusion of Support Actions No 1-8, as the Regional Analysis discussed during the workshop directly covered these

actions. This collaborative event helped to strengthen the regional bioeconomy network and provided concrete steps for advancing circular bioeconomy initiatives in Slovakia.



More info

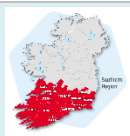
<https://robin-project.eu/together-for-the-slovak-bioeconomy-workshop-zilina-slovakia/>

3.2.5. Southern Region (IE)

The following validation actions took place in Southern Regional Assembly (Table 10). More information about each validation action is provided below.

Table 10: Validation Actions in Southern Region

	Validation actions	Tools/ functionalities	Validation period	Month of completion
1	<i>Consultative Board Meeting</i>	Support Actions Portfolio	Alpha Testing	M20 April 2024
2	<i>Group Meeting 1 – Educational Mapping</i>	Knowledge Platform	Alpha Testing	M20 April 2024
3	<i>Group Meeting 1 - Alpha Stakeholder Event</i>	Environmental Protection Tool	Alpha Testing	M22 June 2024
4	<i>Stakeholder Event</i>	Knowledge Platform, Typology Matrix	Alpha & Beta Testing	M30 February 2025
5	<i>Beta Stakeholder Event</i>	CBGMC / PMT	Beta Testing	M30 February 2025



Validation Action 1

Consultative Board Meeting Support Actions Portfolio/EPP

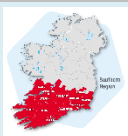
In March 2024, the Southern Regional Assembly (SRA) contacted members of the ROBIN stakeholder consultative group, aligned with quadruple helix principles, to participate in the alpha testing of the ROBIN Toolbox Support Actions Portfolio. The group, composed of senior planning staff from the Southern Regional Assembly, MARC members, and other bioeconomy stakeholders, was provided with background information, a link to the portfolio, and a stakeholder questionnaire to guide the upcoming workshop. The goal was to ensure the workshop focused on key areas for feedback and to allow participants to clarify any questions before the session.

On 15 April 2024, a Teams call was held with six members of the consultative group. After an introduction to the Robin Toolbox and the Support Actions Portfolio, the SRA presented the tools'

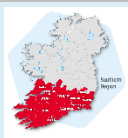
purpose and functionality. Participants shared their feedback during an open discussion, which was recorded and compiled into a report. This report served as the basis for any revisions to the portfolio in preparation for beta testing.

Similarly, in March 2024, the consultative group was invited to participate in the alpha testing of the Environmental Protection Planning Tool, another component of the ROBIN Toolbox. The SRA facilitated a Teams workshop where the tool's purpose was explained, followed by a discussion where participants provided their feedback. Like the Support Actions Portfolio, the results of this session were summarized in a report, which guided the revisions of the Environmental Protection Planning Tool ahead of beta testing.

The key milestone for both components was the compilation of the workshop findings into reports, which informed the necessary updates to both the Support Actions Portfolio and the Environmental Protection Planning Tool in advance of the beta testing phase.

	Validation Action 2
	Knowledge platform
	<p>This validation Action took place in the context of the Alpha testing of the Knowledge Platform and began with an initial planning and data collection by MTU, who contacted the Alpha testing team (IKC3 educational team) on 12 February 2024. A meeting was scheduled for the same day, and the link to the Knowledge Platform was sent out on 16 February 2024, allowing educational professionals to familiarize themselves with the material before the validation meeting. The validation session took place on 20 February 2024, and was attended by two educational professionals from the IKC3 team, who became new MARC members, along with MTU and SRA leaders. During this meeting, 49 identified courses were discussed, and the IKC3 team (educational professionals) added 30 more bioeconomy-related courses to the list.</p> <p>Following the meeting, the educational mapping data was updated, and the map was developed by March 19, 2024. The chapter review and finalization were completed by 26 March 2024, and the final report was completed by 28 March 2024. Regional node partners played essential roles throughout the process: MTU facilitated local outreach and data collection, provided expertise in data analysis, and assisted in identifying gaps, while IKC3 helped synthesize the findings.</p> <p>The key milestone of this support action was the completion of a chapter detailing educational activities in the region, which included a database and map of available courses. The final report, completed on 2 April 2024, was 8 pages long and involved 2 educational experts and 3 team leaders. The validation of the knowledge platform took place via an online Teams meeting, ensuring broader stakeholder engagement. Success indicators include the finalized database and course map, which offer a clear visualization of educational resources and highlight potential gaps.</p>
More info	Chapter of regional Education Activities <i>Chapter-SA5 Comparative study on the Bioeconomy courses in Europe and bioeconomy structure event.pdf</i>

	Validation Action 3
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Alpha Stakeholder Event

This Validation Action took place in the context of the Policy Monitoring Tool alpha testing, and was conducted during a stakeholder event in Waterford, where 14 participants were updated on the progress of the ROBIN Project. The event included a presentation on bioeconomy governance at local, regional, national, and EU levels, setting the stage for discussions on the elements of a bioeconomy regional action plan for southern Ireland. Project partners also introduced research on comparative bioeconomy governance and the tools being developed to support stakeholders in creating a governance roadmap for the bioeconomy.

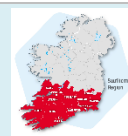
The second part of the workshop focused on gathering feedback on the Policy Monitoring Tool. Participants were divided into two groups and guided through the tool's features and its relevance for developing the bioeconomy regional action plan. Using A3 worksheets, they provided input, which was compiled into a report for the lead partner and used to refine the tool.

The key milestone of this event was successfully bringing together project stakeholders and expanding the network by involving bioeconomy stakeholders previously not connected to the project. In total, 14 stakeholders attended, while eight others, unable to attend in person, expressed interest in continuing to participate in future validation activities. These individuals will be engaged throughout the remainder of the project for alpha and beta testing.



More info

<https://robin-project.eu/robin-workshop-event-held-on-june-25th-2024-at-assembly-house-in-waterford-ireland/>



Validation Action 4

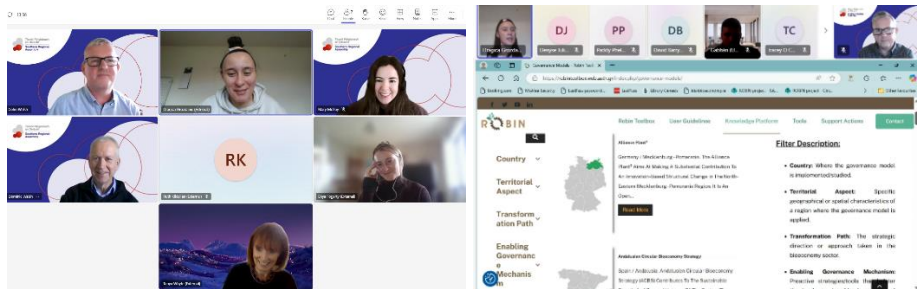
Stakeholder Event - Typology Framework / Knowledge Platform

On 5 December 2024, the Southern Regional Assembly (SRA) and Munster Technological University (MTU) hosted an online beta validation workshop focused on the Typology Matrix and the Knowledge Platform. During the session, participants were introduced to the development process behind both the Typology Framework and the Knowledge Platform, with an emphasis on their practical applications for policymakers. The workshop included a guided walkthrough, hands-on testing, and validation of key aspects such as functionality, usability, and overall performance.

Following the presentations, a dedicated Q&A session allowed for in-depth discussion and feedback. Participants were encouraged to engage with case studies most relevant to the Irish context, fostering a productive and insightful exchange of ideas. The open discussion proved to

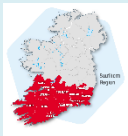
be highly valuable, generating diverse feedback that will directly inform the next steps of the ROBIN Project in the Southern Region of Ireland.

Due to a scheduling conflict on December 5th, representatives from the North-West Regional Assembly and the Eastern and Midland Regional Assembly were unable to participate. To ensure comprehensive input from all regional assembly stakeholders, a follow-up beta testing workshop was organized specifically for regional assembly staff and successfully conducted on 7 February 2025. This additional session ensured that all relevant perspectives were included in the validation process, bringing the beta testing phase to a thorough and well-rounded conclusion.



More info

<https://robin-project.eu/robin-project-beta-validation-workshop-held-in-southern-region-ireland/>



Validation Action 5

Beta Stakeholder Event – Circular Bioeconomy Governance Model Canvas / Policy Monitoring Tool

On 15 October 2024, the Southern Regional Assembly (SRA) and Munster Technological University (MTU) celebrated Bioeconomy Ireland Week 2024 in Assembly House in Waterford, Ireland. The event brought together a panel of expert speakers who delivered presentations on different aspects of bioeconomy from finance to governance. There followed a questions and answer session and discussion that set the scene for a deeper exploration of our themes during our ROBIN Tools validation workshop. The second part of our event focussed on the ROBIN Project. Attendees were given an overview of the Project and an update of Project activities carried out to date by the Irish partners. A validation workshop followed where participants were broken out into groups to discuss and critique questions posed by the workshop moderator into aspects of two tools developed by the Project – the Circular Bioeconomy Model Canvas and the Policy Monitoring System. Collective feedback was presented at the end of each session by each group and separately, participants individually were presented with an opportunity to complete a questionnaire on various elements of each of the tools.

The main outcomes of this validation action were twofold - to promote awareness of the bioeconomy in the region as set out in Support Action number 4 of the southern region validation plan, and to successfully manage and deliver a beta validation workshop concerning two Toolbox resources – namely, the Canvas and the Policy Monitoring System. The event saw the coming together of 28 stakeholders from the bioeconomy in the region as well as representatives from national government departments. The quality of the presentations and the ensuing discussion and ROBIN tool validation workshop were of immense benefit to those in attendance based on feedback received, and a great many new contacts were made through informal networking.

	
More info	https://robin-project.eu/towards-2030-developing-a-circular-bioeconomy-governance-model-for-our-communities-cities-and-regions/

4. Alpha Testing Results

4.1 Overview of alpha testing results

During alpha testing partner regions organized activities to validate ROBIN tools and components and we received 54 internal feedback questionnaires (Andalusia – 9, Central Macedonia – 13, Žilina – 14, Baden-Württemberg – 8, Southern Region – 10).

Toolbox validation questionnaire filled per region

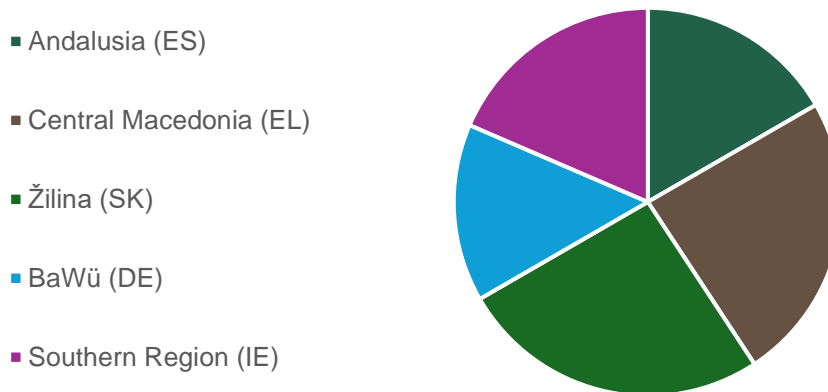


Figure 4: Toolbox validation questionnaires filled per region during alpha testing.

Each component of the Toolbox was validated in at least 8 validation actions (Knowledge Platform KP – 8, Circular Bioeconomy Governance Model Canvas CBGMC – 8, Policy Monitoring System PMS – 8, Environmental Protection Planning Tool EPPT – 10, Support Action Platform SAP – 20).

Validation questionnaire per toolbox component

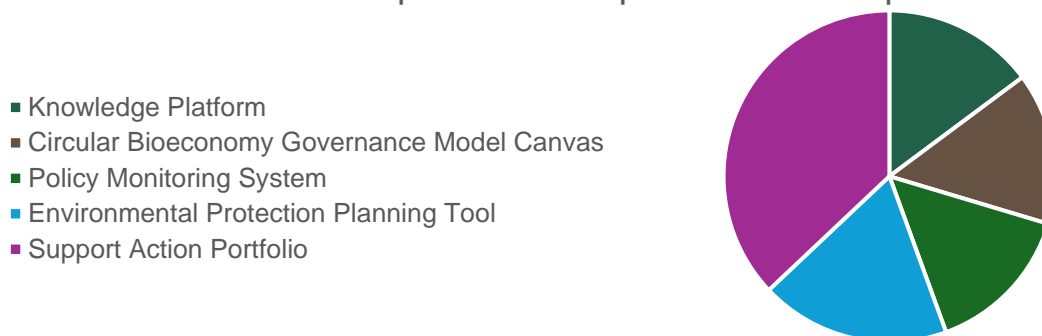


Figure 5: Validation questionnaires filled during alpha testing per component of the toolbox.

All regions managed to involve all four quadruple helix user groups in the validation of the Toolbox. Overall, the Government stakeholders were most strongly represented (33%), followed by Business (22%), Higher Education (22%), Civil Society (19%), and Others (4%).

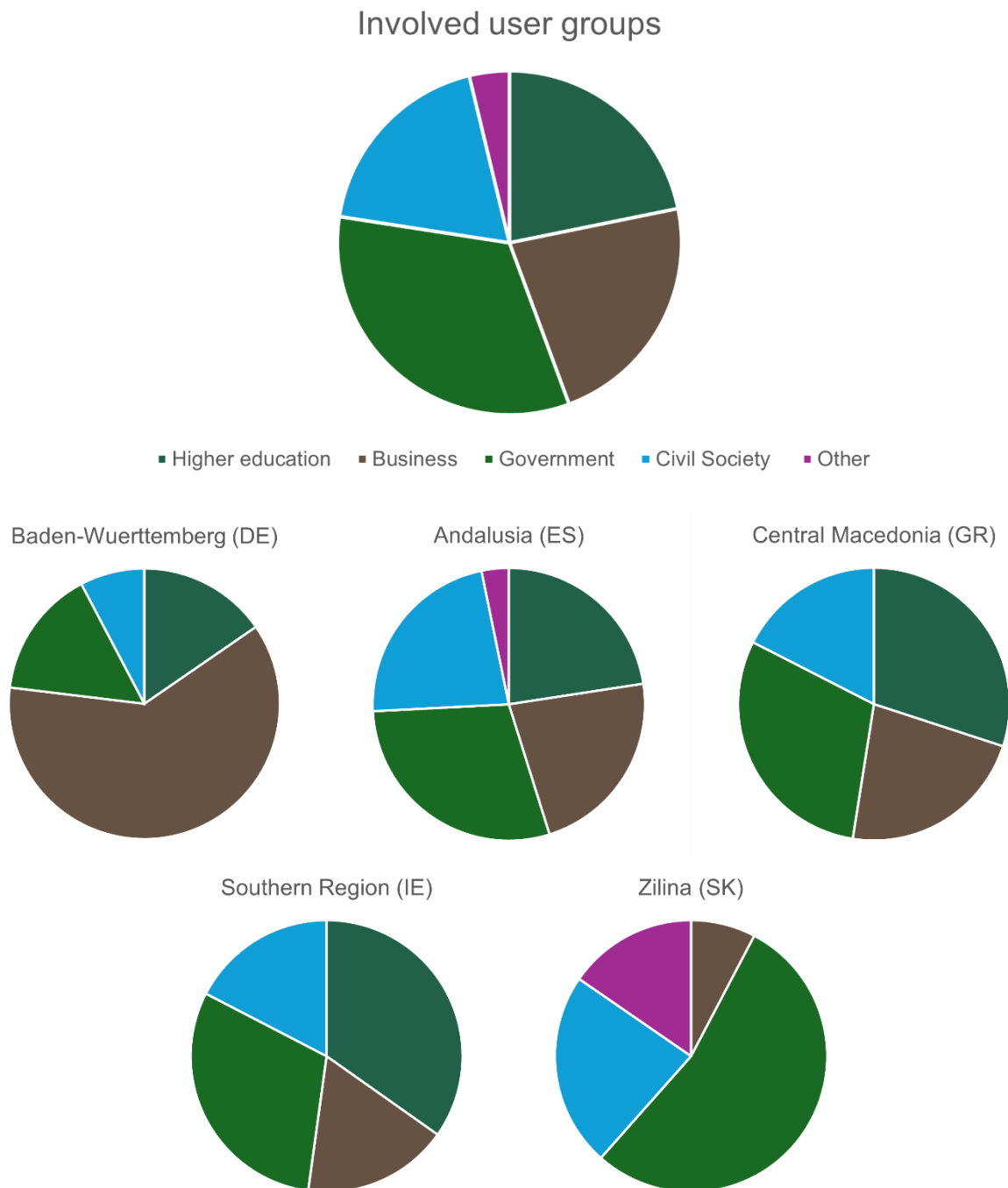


Figure 6: User groups involved in the alpha testing of the ROBIN Toolbox overall and per ROBIN region.

In summary, the ROBIN alpha testing provided a strong dataset allowing the project to draw meaningful conclusions on the performance of the components of its Toolbox and potential areas of improvement. This section provides an overview of the results from alpha testing, the conclusions drawn from them, and the steps taken to address the feedback received. These results were also discussed with the ROBIN advisory board and the ROBIN MARC members in an online validation workshop (see Section 2.5).

4.2 User experience and functionality

To assess the user experience and functionality of the Toolbox partners were asked after every validation action whether i) the design of the Toolbox component tested was user-friendly and intuitive and ii) whether the website was easy to use and navigate.

Overall, in 76% of the responses the **design of the toolbox components** was evaluated positively with the KP receiving 100% positive responses. The PMS was rated lowest with only 50% of the evaluations reporting a positive experience.

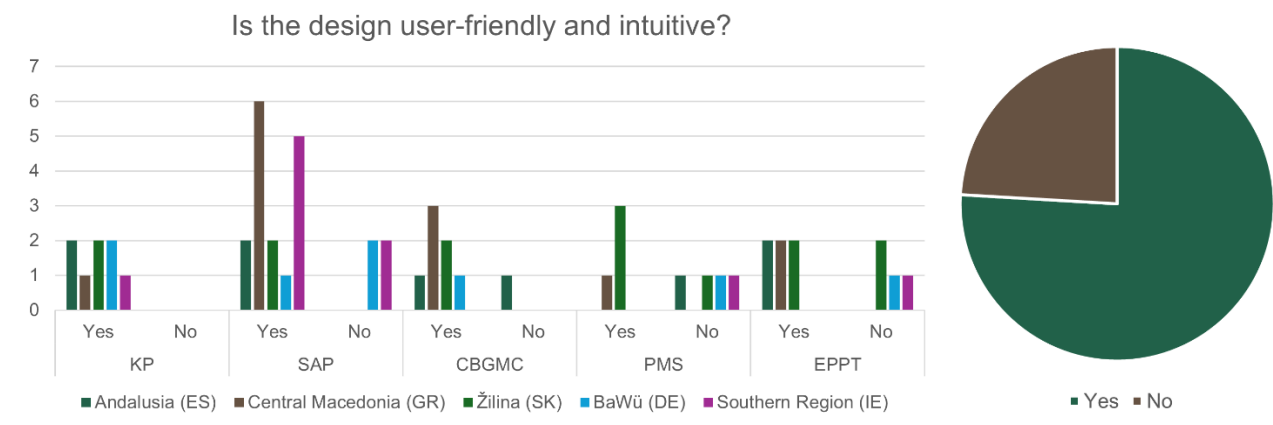


Figure 7: “Is the design of the Toolbox user-friendly and intuitive?”

The left graph shows the responses sorted per region and component of the toolbox. The right graph shows the total ratio of positive and negative responses.

In reaction to a negative rating the project partners were asked to provide an explanation.

The **website** itself received an even better evaluation (regarding whether it was easy to use and navigate) with 94% positive responses with the SAP, the KP and the CBGMC receiving a perfect 100% score. The PMS was again rated lowest with 25% negative ratings.

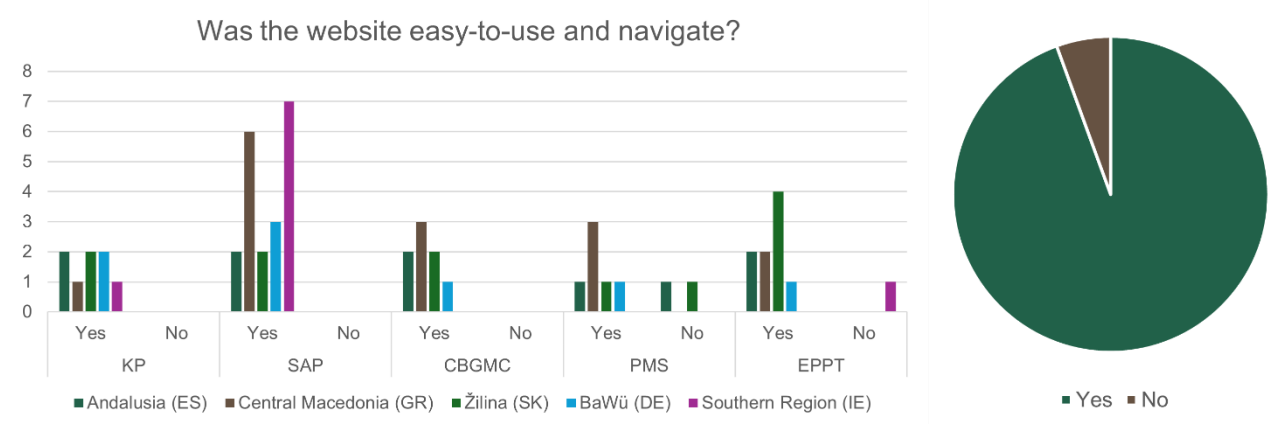


Figure 8: “Was the website easy-to-use and navigate?”

The left graph shows the responses sorted per region and component of the toolbox. The right graph shows the total ratio of positive and negative responses.

In reaction to a negative rating the project partners were asked to provide an explanation, and the responses are summarized below:

Policy Monitoring System:

- The instructions for navigation between the web-based version of the Tool and the Excel spreadsheet should be made clearer, as it is not very easy to find.
- As a policymaker, it would be helpful if the indicators could be modified by end users in order to be able to add or subtract indicators as relevant to conditions in the region. This would be useful as a monitor as policies develop dynamically and progress is made over time, rather than the static designation of 'not applicable'. The addition of a category 'not yet in progress' might be useful, in addition to a column for timescale to implementation.
- The Excel spreadsheet is a very large document containing a huge amount of text, it would be easier to navigate perhaps if the categories could be index tabulated.
- The "user guidance" section should be put in a more visible location on the page.

Environmental Protection Planning Tool

- It is not immediately obvious that a version needed to be downloaded for use with stakeholders.
- The online version contains formatting under the 'Description' heading that could be easier to navigate - the text in some of the questions is cut off and users are required to refer to the text box at the top of the workbook to view the full text.

These results led to the conclusion that the user experience and functionality of the Toolbox was satisfactory and only minor adjustments relating mostly to the downloadable Excel files are necessary.

4.3 Relevance and quality

To assess the relevance and quality of the Toolbox partners were asked after every validation action i) for which user group they would recommend the use of the toolbox components, ii) if any gaps or inaccuracies were identified, and iii) if the Toolbox is relevant and efficient to meet the unique challenges and opportunities of their region.

Since all quadruple helix stakeholders were involved in testing the Toolbox partners were able to form an opinion on which stakeholder group the tools are most suited for. The analysis showed that while the Toolbox can be of interest to all stakeholders partners see it as best suited for governance stakeholders (33%) followed by business stakeholders (24%), higher education stakeholders (21%), civil society (19%) and others (3%).

Recommended user groups

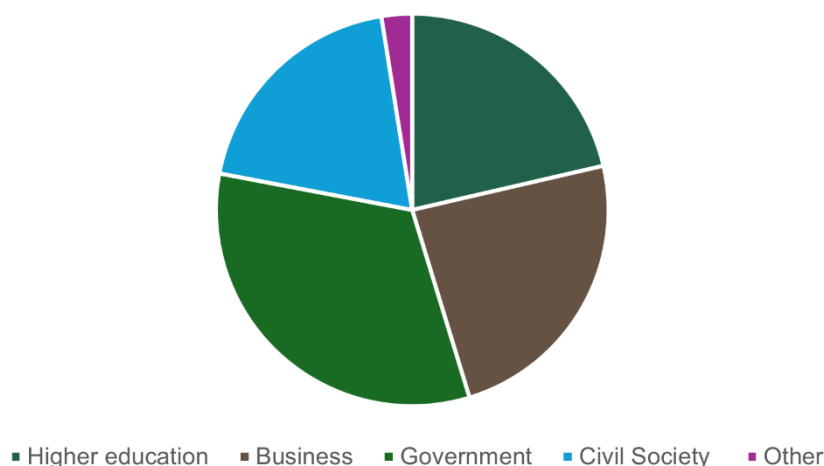


Figure 9: "Based on your experience, for which user groups would you recommend the use of the tools":

Graph shows the ratio of responses from all regions.

In 65% of the analysed validation activities no gaps or inaccuracies were identified. The best rated component of the Toolbox was the SAP with 80% negative responses (no gaps/inaccuracies), and the PMS was the weakest with 62.5% positive responses.

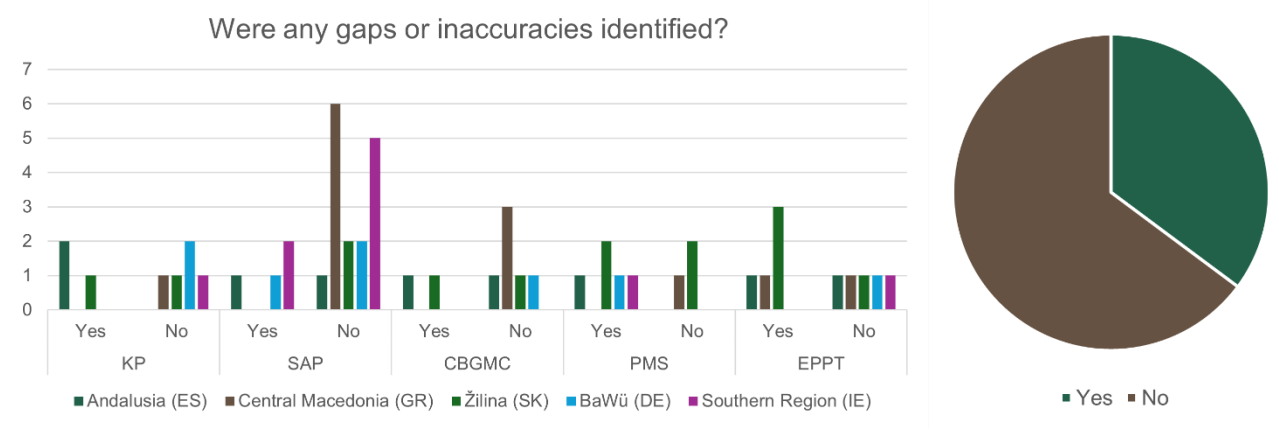


Figure 10: "Were any gaps or inaccuracies identified?"

The left graph shows the responses sorted per region and component of the toolbox. The right graph shows the total ratio of positive and negative responses. When partners indicated that they had identified gaps and inaccuracies they were asked to specify.

Partners rated relevance and efficiency of the Toolbox to meeting the unique challenges and opportunities of their regions very highly with 91% positive feedback. The EPPT was evaluated best and received a perfect score of 100% while the KP received the lowest rating with 75% positive responses.

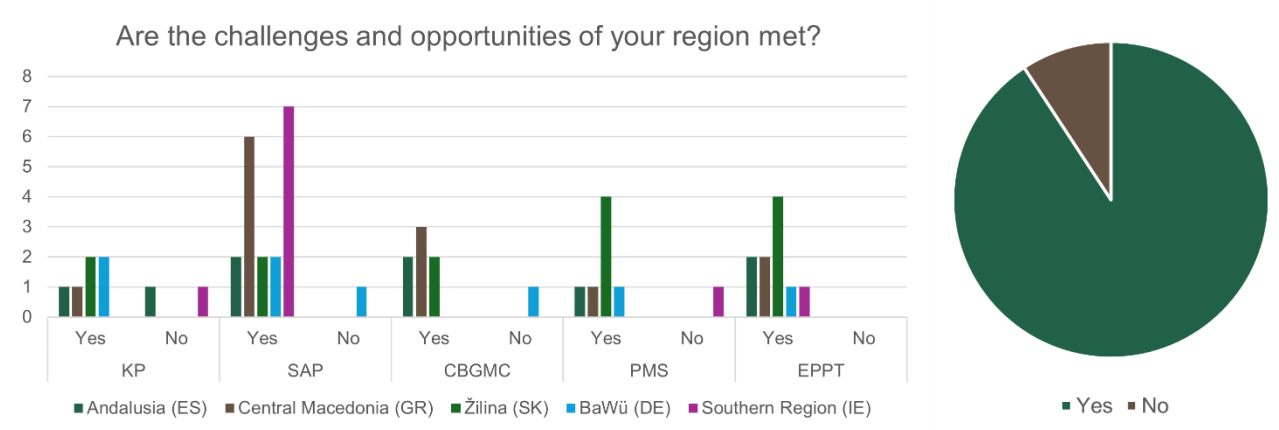


Figure 11: "Is the Toolbox relevant and efficient to meet the unique challenges and opportunities of your region?"

The left graph shows the responses sorted per region and component of the toolbox. The right graph shows the total ratio of positive and negative responses. In reaction to a negative rating the project partners were asked to provide an explanation.

In summary, **the analysis of the overall relevance and quality of the Toolbox led to the conclusion that the Toolbox is very well suited to the targeted stakeholder group (mainly governance) and is highly relevant to meeting the challenges the regions are facing in transitioning to a sustainable circular bioeconomy.** At the end of alpha testing, some adjustments to the contents of the Toolbox needed to be made such as including more information, removing mistakes and resolving unclarities in the descriptions and guidelines.

4.4 Impact

To assess the impact of the Toolbox partners were asked after every validation action i) how relevant the applied toolbox component was for the success of the activity, and ii) how likely the adoption and continued use of the Toolbox is after the project has ended.

The **relevance of the toolbox components for the success of the validation actions varied between regions but was in general evaluated positively** with an overall average of 78.4%. Best evaluated was the PMS (90%) followed by the CBGMC (85%), the EPPT (80%), the KP (70%) and the SAP (67%). These numbers show that the validation actions were in general well designed and suited to the toolbox components. Furthermore, it shows that the Toolbox can add value and support the regions in carrying out support actions towards the establishment of a sustainable circular bioeconomy.

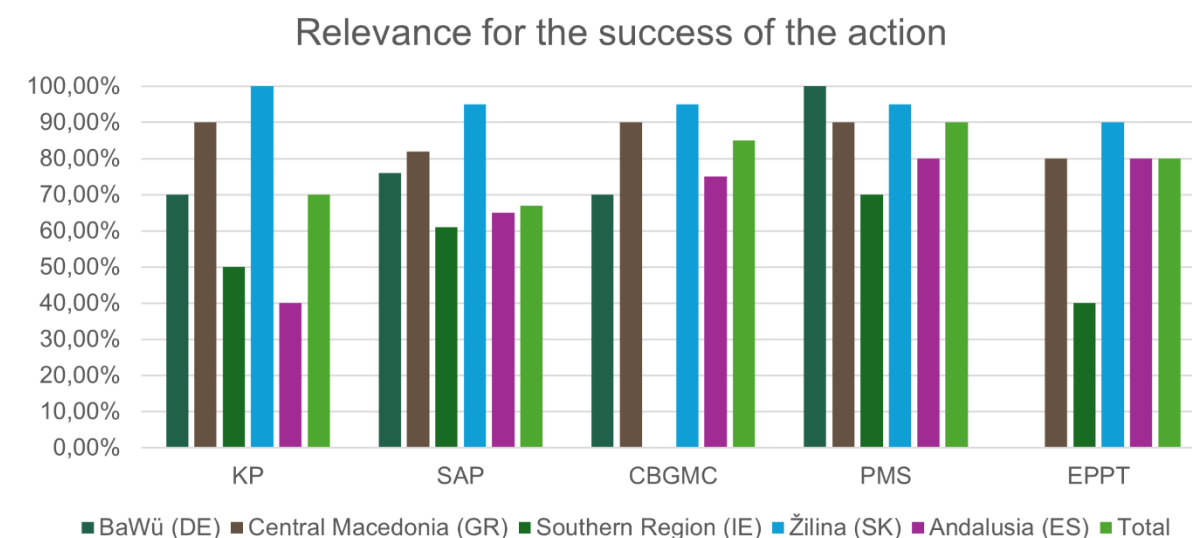


Figure 12: Relevance of the ROBIN tools for the success of the actions carried out during alpha testing

When analysing the responses on the **likelihood of continued adoption and application of the Toolbox** a remarkably similar picture emerged. The likelihood was **in general** pronounced to be **high** with an average of 71.4%. The PMS and CBGMC received the highest score (81%) followed by the EPPT (70%), the KP (64%), and the SAP (61%). Interestingly, there is a **significant connection between the relevance of a toolbox component to the success of activities in a specific region and its likelihood of continued application**.

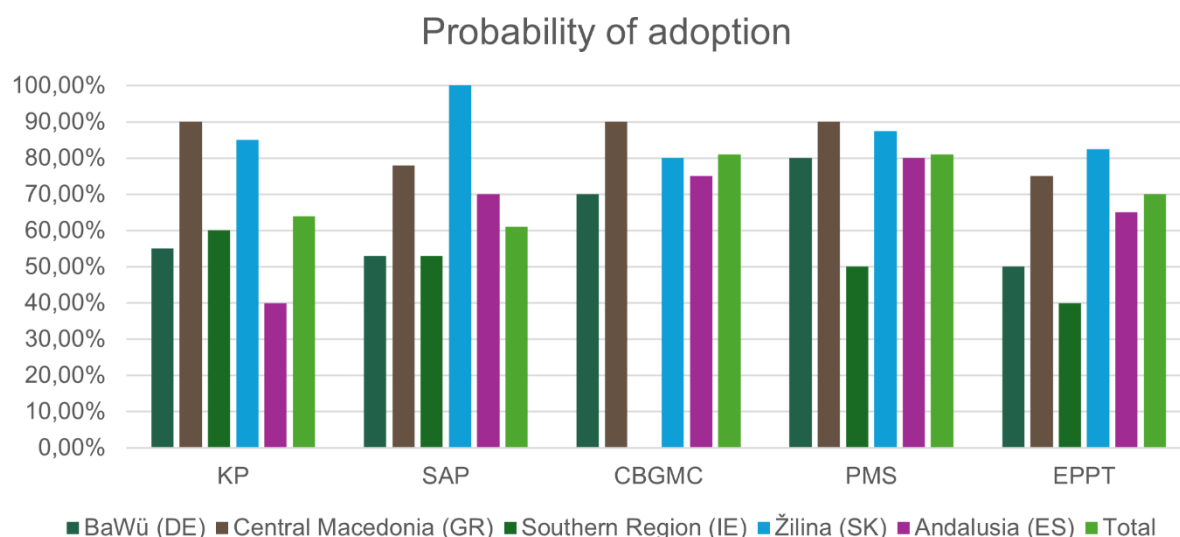


Figure 13: Probability of future adoption of the ROBIN tools after alpha testing

This shows that in general there is a need for the Toolbox as well as a readiness to adopt new tools, however it is important to demonstrate the added value of such tools to stakeholders clearly. When planning beta testing activities as well as implementing the open call for external regions project partners were asked to take this lesson into consideration and ensure that they clearly demonstrate the use of the Toolbox and explain the added value that can be gained by implementing them to ensure its continued impact after the project has ended.

Based on the results of alpha testing and the discussions during the Validation Workshop and the 5th project meeting six main areas of improvement to be considered during the alpha update were identified: 1) Improvement of user guidelines, 2) Short video for demonstrating the use of the tool, 3) Additional content, 4) Adaptability, 5) Filtering options, and 6) Improvement of clarity. All tool owners were asked to consider these points, decide on plans for addressing them, and carry out the necessary changes. Additionally, they were encouraged to add additional areas based on the individual feedback provided. Task leader S2i provided a reporting template to record the progress made.

4.5 Knowledge Platform

4.5.1 Feedback collected and other insights

In addition to answering the general questions on user experience and functionality, relevance and quality, and impact of the knowledge Platform, partners also answered several specific questions.

As the Knowledge Platform is made up of two components: the collection of Governance Models and the collection of Good Governance Practices partners were asked whether they used one or the other or both collections in their validation actions. In the majority of cases (75%) both collections were used, showing that both are of equal interest and relevance.

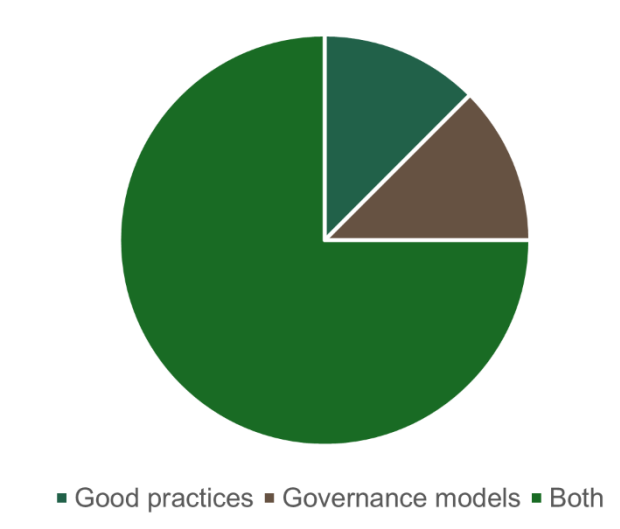


Figure 14: Parts of the Knowledge Platform used during alpha testing

Asked whether they found the information in the tool accurate and up-to-date partners answered in the affirmative in 88% of the cases. However, when asked whether the information on the platform was sufficient in 63% of the cases the answer was that more content should be added. These results show clearly that **while the content provided on the platform is of high quality and interest the platform might be improved by adding additional examples.**

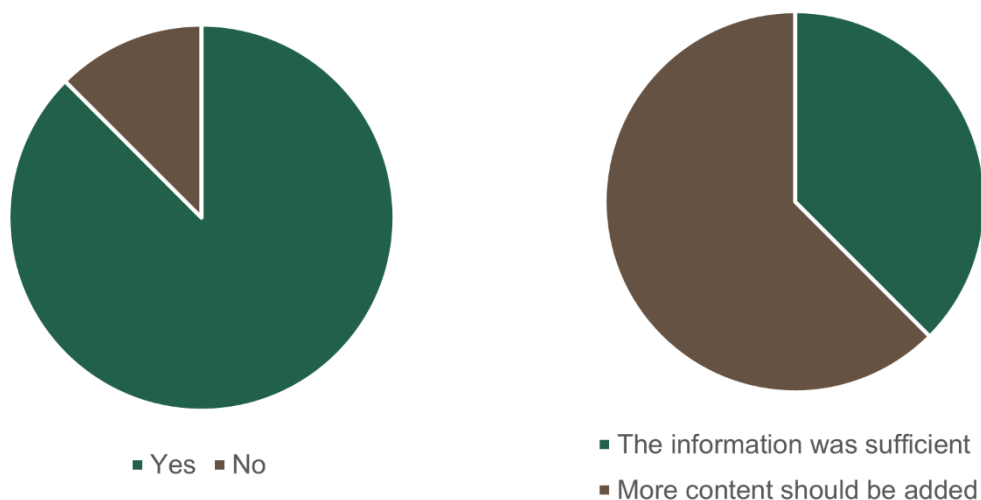


Figure 15: Accuracy and sufficiency of the information provided in the Knowledge Platform

Left graph – Was the information accurate and up-to-date? Right graph – Was the information sufficient?

4.5.2 Updates and improvements

The results were discussed during the Advisory Board Validation Workshop on 26 September 2024 and the 5th ROBIN project meeting on 8 October 2024, and the recommendations were provided to the tool owners AUTH and MTU who were responsible for the update of the Knowledge Platform (the governance models and good practices sections respectively). It resulted from the different discussions that six main areas of improvement should be considered for the update before beta testing: 1) Improvement of user guidelines, 2) Short video for demonstrating the use of the tool, 3) Additional content, 4) Adaptability, 5) Filtering options, and 6) Improvement of clarity.

Below are AUTH's and MTU's implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
Explore the potential of producing a short video introduction into the tool and its use.	After careful consideration we decided to not address this area because we feel that the typology matrix framework guidelines allocated in the support actions section already explains what a short video would do (as a short video would only serve as a commentary guideline and not a dynamic one as this is not a dynamic tool but a knowledge platform).	None
Add more content to the tool/platform/portfolio	Additional Governance Models can be added if needed (Also taking in account a more variable line of countries and not predominantly Germany and Spain as one comment (from Baden-Wurttemberg) pointed out). AUTH's concern is that in this moment governance models amount is 20, whereas good practices amount is 10 – the suggestion would be to only add additional governance models on par with the good practices (i.e. 20 governance models – 20 good practices, 30 governance models – 30 good practices, etc.).	No additional governance models were added (Please see governance models plan for addressing the area for proper amount – As 10 more good practices will be added, bringing the total amount to 20, AUTH and MTU feel that the knowledge platform is well balanced now). In case there is still need of more case studies they can be added after beta testing.

Table 11: Updates and improvements made to the Knowledge Platform (alpha testing)

4.6 Support Action Portfolio

4.6.1 Feedback collected and other insights

In addition to answering the general questions on user experience and functionality, relevance and quality, and impact of the Support Action Portfolio, partners also answered several specific questions.

During alpha testing, the SAP contained 49 support actions that were categorized as i) Regional Analysis Measures, ii) Social Measures, and iii) Technical Measures.

The collected data shows that all three types of measures are equally relevant with 38% of responses rating Social Analysis Measures as most relevant to their action followed by Regional Analysis measures (35%) and Technical Measures (27%).

Out of the 49 support actions in portfolio 36 were applied at least once during alpha testing reflecting a thorough validation of the contents of the portfolio. The two measures most often used were “Stakeholder Engagement: Academia” (6 times) and “Networking Activities Among Relevant Regional Stakeholders” (5 times).

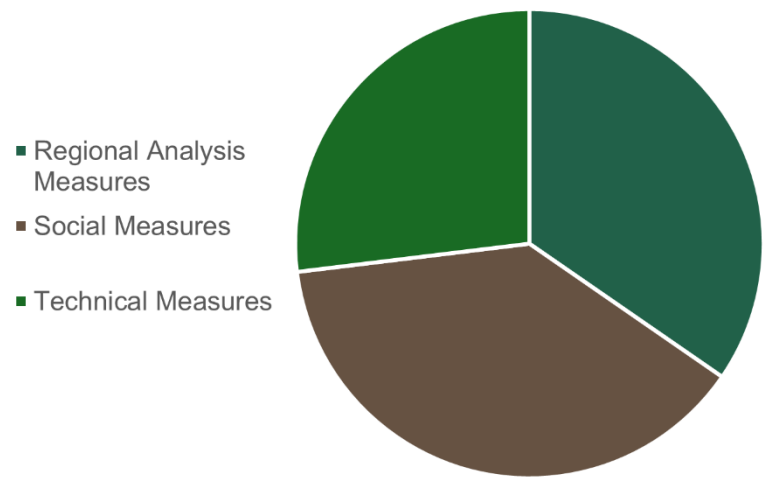


Figure 16: Types of Support Action used during alpha testing

The **quality of the description of the individual support actions was evaluated very positively with 90% of responses** indicating no need for any changes. Furthermore, 95% of responses indicated that the information in the portfolio is sufficient, and no additional content needs to be added.

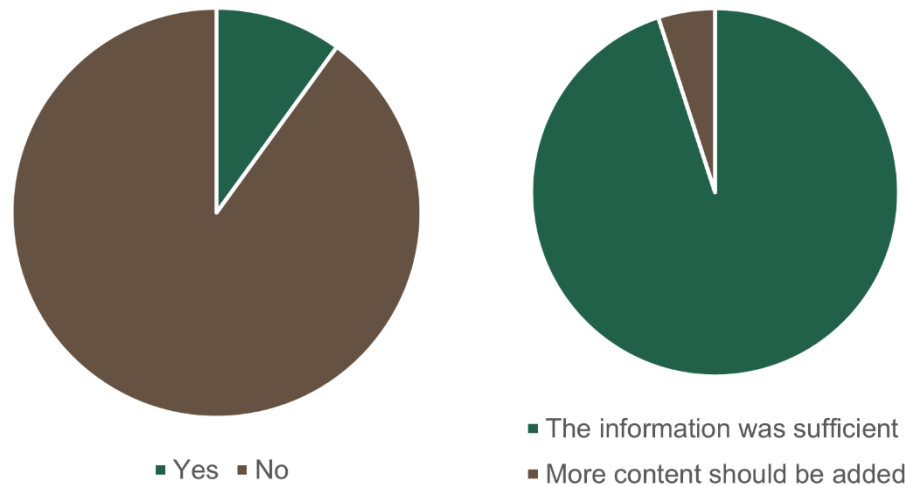


Figure 17: Quality and sufficiency of the information provided in the Support Action Portfolio

The left graph – Should any changes be made to the descriptions of the Support Action? The right graph – Was the information sufficient?

4.6.2 Updates and improvements

The results were discussed during the Alpha Validation Workshop and the 5th ROBIN project meeting, and the recommendations were provided to the tool owner CTA who was responsible for the update of the portfolio.

Below are CTA’s implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
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<p>Improvement of user guidelines</p> <p>(good example: visual user guidelines of the PMS)</p>	<p>Complete the introductory text about the SAP and what it can be used for.</p> <p>Support Actions List</p> <p>Tool with a collection of material and examples for action plans to support regional capacity building, in areas such as raising stakeholder awareness and engagement.</p> <p>As the regional filter has not been included, I would erase the regions image.</p> <p>Spain Andalusia</p> <p>Greece Central Macedonia</p> <p>Germany Baden-Württemberg</p> <p>Ireland Southern Region</p> <p>Slovakia Žilina</p> <p>Improve the display of:</p> <ol style="list-style-type: none"> 1) Filters – With a dedicated space including the description, the categories and the keyword search (separate from the titles of the support actions) <p>Filter Description</p> <p>• Type of Measure: Expresses the specific approach or method employed in the support action based on its nature.</p> <p>Search Here: <input type="text"/> Search</p> <p>Type Of Measure</p> <p>Regional Analysis Measure <input type="radio"/> Analysis Of Business Resources And Potential</p> <p>Social Measures <input type="radio"/> Analysis Of Regional Financing Opportunities Private Initiatives</p> <p>Technical Measures <input type="radio"/> Analysis Of Regional Funding Mechanisms And Instruments (Public Level)</p> <ol style="list-style-type: none"> 2) Support Actions – enlarge the size of the titles and include a colour code per category of measure. 	<p>Website was updated according to the instructions by AUTH</p>
<p>Explore the potential of producing a short video introduction into the tool and its use.</p>	<p>Doable but counting on external support for developing a professional short video.</p>	<p>Since no budget is foreseen for the production of a professional video and changes were already implemented to the design of the portfolio this will be explored again after beta testing.</p>
<p>Make the tool/platform/portfolio more adaptable</p>	<p>Highlight in the toolbox the key word search, as a tool for finding more appropriated content depending on the specific topic of interest. I.e. Communication.</p>	<p>Website was updated according to the instructions by AUTH</p>
<p>Explore additional filtering options</p>	<p>Highlight in the toolbox the key word search, as a tool for finding more appropriated content depending on the specific topic of interest. I.e. Communication.</p>	<p>Website was updated according to the instructions by AUTH</p>
<p>Improve clarity of the content of the tool/platform/portfolio</p>	<p>Implementation Of LCA Tools For Regional Activities Measure: the description is non-aligned with title and duplicating matchmaking one. We suggest to erase this measure</p>	<p>Measure was erased</p>

Table 12: Updates and improvements made to the Support Action Portfolio.

4.7 Circular Bioeconomy Governance Model Canvas

4.7.1 Feedback collected and other insights

In addition to answering the general questions on user experience, functionality, relevance, quality and impact of the CBGMC, partners also answered several specific questions. They were asked to describe for what kind of actions they would recommend the use of the tool based on the experiences gained during alpha testing. This information was shared with the consortium and was included in the validation actions in beta testing to ensure that they are well suited to the tool and can demonstrate its usefulness to the involved stakeholders.

In response to the question of whether the provided guidance on how to use the CBGMC is sufficient, 87% of the responses were positive, indicating that the CBGMC can be easily applied by interested stakeholders.

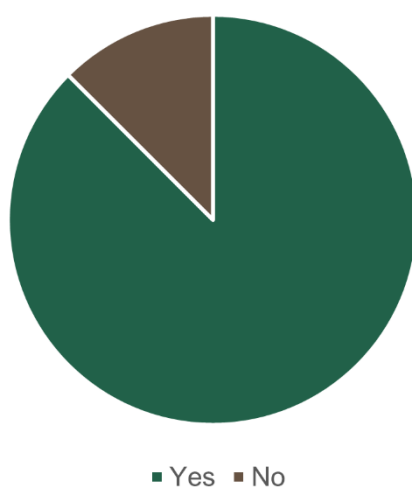


Figure 18: Sufficiency of the provided guidance for the Circular Bioeconomy Governance Model Canvas

4.7.2 Updates and improvements

The results and recommendations were discussed during the Alpha Validation Workshop and the 5th ROBIN project meeting.

Below are MTU's implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
Improvement of user guidelines (good example: visual user guidelines of the PMS)	In the guidelines will expand the scope of potential use of canvas beyond creation of governance model. We will add some use cases to the guidance document. We will add some extra guidance notes for moderation within the guidance document. We can some add some questions instead of descriptions (however, we need more clarify on what is meant here).	The guidance document has been updated as described. Changes to the descriptions will be implemented after beta testing if testers still feel it necessary in addition to the new, more detailed guidelines.
Explore the potential of producing a short	We don't feel that this is required.	No video had been produced since the updated guidance

video introduction into the tool and its use.		document already explains the use of the tool in detail.
Add more content to the tool/platform/portfolio	The tool will not be updated, but guidelines will be added to.	Guidelines have been updated
Make the tool/platform/portfolio more adaptable	We have explored the potential of making the tool interactive via digitalization, however, we find this is a bit contrary to the nature of the canvas, which is best utilised in a group in-person setting.	No changes were made.

Table 13: Updates and improvements made to the Circular Bioeconomy Governance Model Canvas (alpha testing)

4.8 Policy Monitoring System

4.8.1 Feedback collected and other insights

In addition to answering the general questions on user experience, functionality, relevance, quality and impact of the PMS, partners also answered several specific questions.

Both the questions “Did you find the PMS helpful?” and “Is the provided guidance on how to use the tool helpful and sufficient?” received 100% positive responses suggesting that the visual user guidelines developed by AUTH can be used as an example to improve the user guidelines of other components of the toolbox.

Partners were furthermore asked to describe for what kind of actions they would recommend the use of the tool based on the experiences gained during alpha testing. This information was shared with the consortium and was included in the validation actions in beta testing to ensure that they are well suited to the tool and can demonstrate its usefulness to the involved stakeholders.

In summary, the PMS performed very well, and the user guidelines were very well received. Most comments focused on the progress tracker, a support tool developed in response to feedback from external experts during the review meeting, which needs to be updated and made more user-friendly and adaptable.

4.8.2 Updates and improvements

The results were discussed during the Alpha Validation Workshop and the 5th ROBIN project meeting, and the recommendations were provided to the tool owner AUTH who was responsible for the update of the PMS.

Below are AUTH’s implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
Make the tool more adaptable	The progress tool, not the PMS, was developed to track policy creation and status; since it relies on the PMS, adding new indicators is currently not	No further additions will be made to the PMT.

	possible. For more details, refer to Answer 1 on baseline data (comment 13) and Deliverable 2.3 for information related to comments 14 and 15, which will be referenced in the instruction section.	
Improve functionality of the PMT's Progress Tool	The proposed improvements will help policymakers track their progress more effectively. In response to comment 2, the workbook's overall percentage is detailed and accounts for the progress of each indicator, rather than merely indicating which indicators have been addressed.	<ul style="list-style-type: none"> - Options for tracking the progress per suggestion have been added (Not Applicable, Applicable but not Initiated, In Progress, Completed) - A separate progress percentage which tracks the progress of each indicator according to the progress of its corresponding suggestions has been set correctly. - A separate download button has been added to the webpage, above the interactive progress tracker excel tool. - Fixed the position of titles to facilitate the tracker's usage. - Two columns which policymakers can select the period based on which the suggestion is tracked have been added.
Improvement of the PMT's Progress Tool usage	Addressing these valid comments will assist policymakers in more easily visualizing their policy integration progress. For comment 15, the relevant information is available in Deliverable 2.3, and we will include this redirection in the instruction section.	<ul style="list-style-type: none"> - A "Traffic Light" system has been added to the workbooks overall progress and to each total progress per indicator percentages.
Content inaccuracies found	The percentage on said indicator is indeed wrong. Regarding comment 2, it is specific enough and will not be split into two.	<ul style="list-style-type: none"> - Metric on indicator corrected.
Improvement of user guidelines and user experience	The comments clearly indicated that the user navigates with difficulty in the tool's webpage. The instructions which we included inside the excel were not accessed. We will make the instructions clearer and restructure the tool's webpage.	<ul style="list-style-type: none"> - Added a separate section in the webpage of the PMT for the progress monitoring progress tool which is preceded by the addition of its instructions since the separate tab on the excel workbook was hard to find. - Added a link to the Deliverable 2.3 within the instructions to assist with the understanding of the timeframe and the knowledge baseline on which the PMS was created.

Table 14: Updates and improvements made to the Policy Monitoring System

4.9 Environmental Protection Planning Tool

4.9.1 Feedback collected and other insights

In addition to answering the general questions on user experience, functionality, relevance, quality and impact of the EPPT, partners also answered several specific questions.

The data analysis showed some **need for additional user instructions** as 40% of responses indicated that additional help from tool owner QPL beyond the provided user guidelines was necessary to apply the tool. In response to the question “Did you spot any indicators that were not easy to understand or that could not easily be assessed?”, 70% of responses came back negative. Partners that responded in the affirmative were asked to identify the problematic indicators and tool owner QPL reacted accordingly by simplifying the descriptions. In 90% of the validation actions performed participants had no trouble accessing the kind of information required to fill in the tool and assess the region’s environmental performance indicating that the involved stakeholders had been adequately selected.

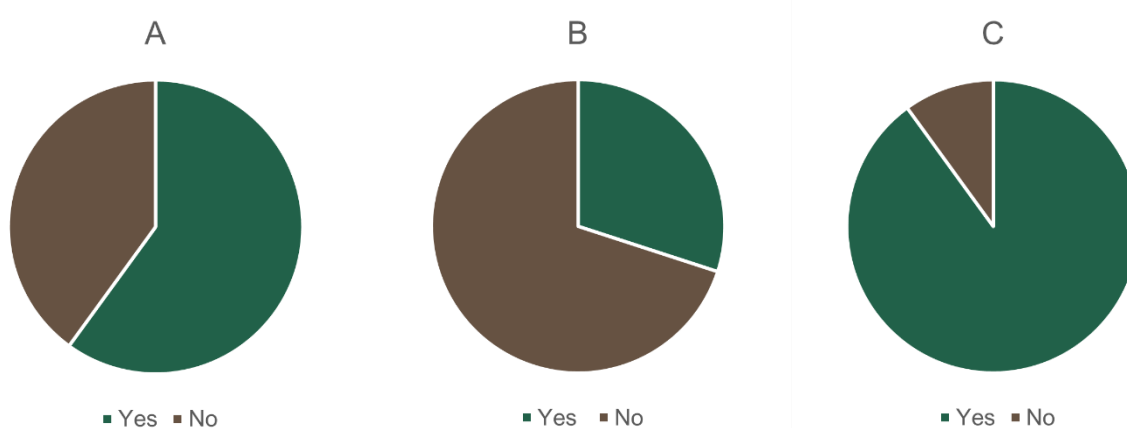


Figure 19: Evaluation of the Environmental Protection Planning Tool

A - Did reading the instructions help you use the tool without additional help from some expert or QPL?

B - Did you spot any indicators that were not easy to understand or that couldn't easily be assessed?

C - Did you easily find the kind of information required to fill in the tool and assess the region's environmental performance?

Partners were furthermore asked to describe for what kind of actions and which type of user group they would recommend the use of the tool based on the experiences gained during alpha testing. This information was shared with the consortium and was included in the validation actions in beta testing to ensure that they are well suited to the tool and can demonstrate its usefulness to the involved stakeholders.

4.9.2 Updates and improvements

The results were discussed during the Alpha Validation Workshop and the 5th ROBIN project meeting, and recommendations were provided to the tool owner QPL who was responsible for the update of the EPPT.

Below are QPL's implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
<p>Improvement of user guidelines</p> <p>(good example: visual user guidelines of the PMS)</p>	<ul style="list-style-type: none"> • Visual user guidelines will be updated to explain step-by-step how to use the tool. • Moderator tips will be included • 2-3 examples of how the tool can be used to support a support action will be provided. • Information about the value and impact of adopting its future use after the project end will be added 	<ul style="list-style-type: none"> • New guidelines have been added and more in particular as the steps that users need to follow in order to complete the tool. You can find them in the first sheet of excel. • Parentheses have been also added clarifying more the above guidelines with examples. • Support actions that EPP tool contributes: <ul style="list-style-type: none"> - Analysis of the barriers for the deployment of the bioeconomy - Design of dedicated capacity building programmes for specific areas at regional level - Design of dedicated monitoring and evaluation tools - Identification of bioeconomy good practices at regional level - Identification of educational offer in bioeconomy at regional level - Implementation of regional bioeconomy strategy analysis - Performance of a regional evaluation system for bioeconomy innovations - Stakeholder engagement • The main value that can be extracted from the tool is to: <ul style="list-style-type: none"> - facilitate discussions among policy makers to establish a baseline of current performance and to set ambitions and plan priorities for the region - Illustrate the progress made in the different indicators - Plan the improvement of the environmental performance - prepare strategic documents and make decisions • The value and the impact of the tool can be found into: <ul style="list-style-type: none"> - stakeholders engagement that is taking place for the decision making at regional level. - Monitoring of environmental initiatives at regional level - the design of new regional policies plans and strategies that include environmental aspects - the prevention and mitigation of adverse effects during the implementation of the circular bioeconomy policy.
<p>Explore the potential of producing a short video introduction into the tool and its use.</p>	<ul style="list-style-type: none"> • A short video introduction into the tool and its use (2 min. max) will be created 	<ul style="list-style-type: none"> • A video will be added with more illustrative guidelines and a demonstration on how to use the tool.
<p>Make the tool/platform/portfolio more adaptable</p>	<ul style="list-style-type: none"> • Tool will be modified so that indicators can be removed or modified, in order to facilitate assessment (?) 	<ul style="list-style-type: none"> • All the indicators are necessary for the assessment of the environmental performance. Indicators that do not exist will be considered as “zero” and the actions will be based on its improvement.

	<ul style="list-style-type: none"> The tool will be modified so that barriers can be weighted according to relevance 	<ul style="list-style-type: none"> Barriers are already weighted into 3 different levels ↑, ↗, →
Explore additional filtering options	<ul style="list-style-type: none"> The tool will be modified to include a filter for distinguishing between rural / urban areas (?) 	<ul style="list-style-type: none"> This tool and in general our project has a regional approach which means that the support actions and the project activities need to cover the whole regional level including urban, peri-urban, rural, forestry, industrial, etc. environments.
Improve clarity of the content of the tool/platform/portfolio	<ul style="list-style-type: none"> We will add some references/benchmark data to define what a level of 1-5 means 	<ul style="list-style-type: none"> Such information has been added in the first sheet of the excel file.

Table 15: Updates and improvements made to the Environmental Protection Planning Tool (alpha testing)

5. Beta Testing Results

5.1 Overview of beta testing results

During beta testing partner regions organized activities to validate ROBIN tools and components and we received 14 feedback questionnaires (Andalusia – 1, Central Macedonia – 6, Žilina – 4, Baden-Württemberg – 1, Southern Region – 2).

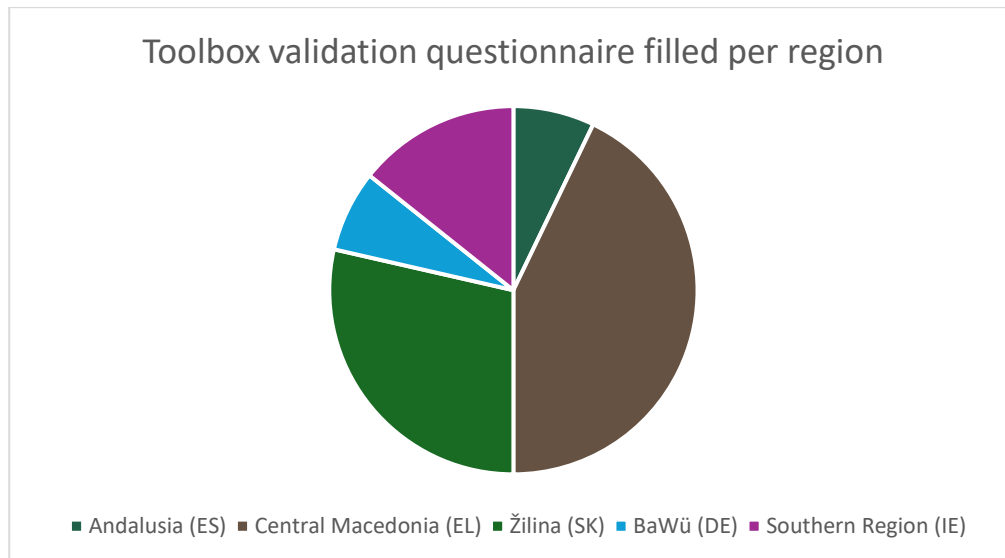


Figure 20: Toolbox validation questionnaires filled per region during beta testing

Each component of the toolbox was validated at least once (Circular Bioeconomy Governance Model Canvas CBGMC – 5, Policy Monitoring System PMS – 3, Support Action Platform SAP – 3, Knowledge Platform KP – 2, Environmental Protection Planning Tool EPPT – 1).

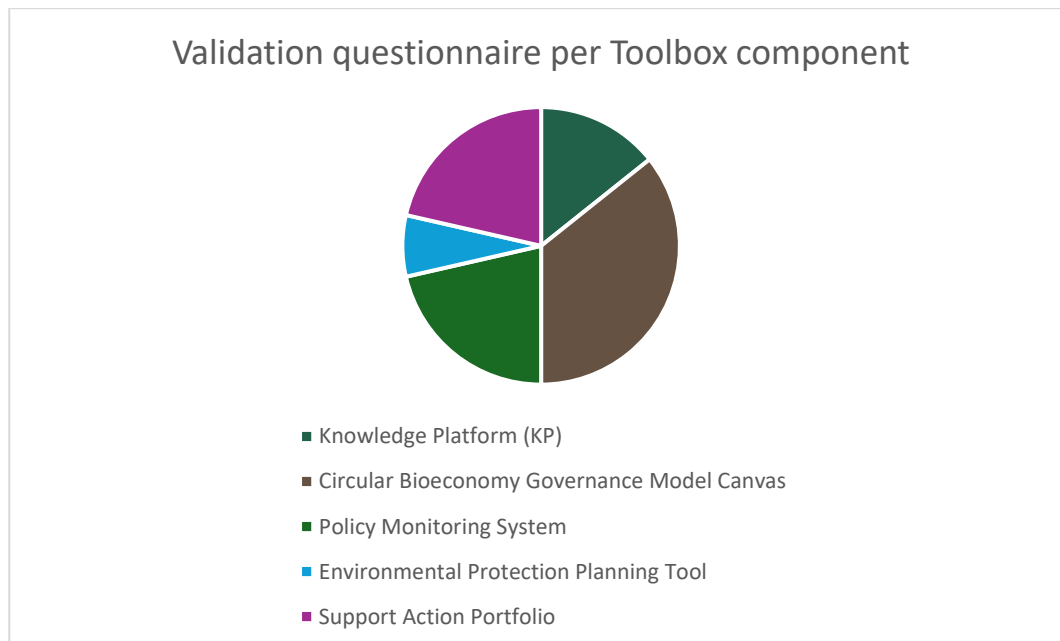


Figure 21: Validation questionnaires filled during beta testing per component of the Toolbox

The regions managed to involve all four quadruple helix user groups in the validation of the Toolbox. Overall, the Government stakeholders were most strongly represented (27%), followed by Business (24%), Civil Society (24%), Higher Education (20%), and Others (MARC members) (4%).

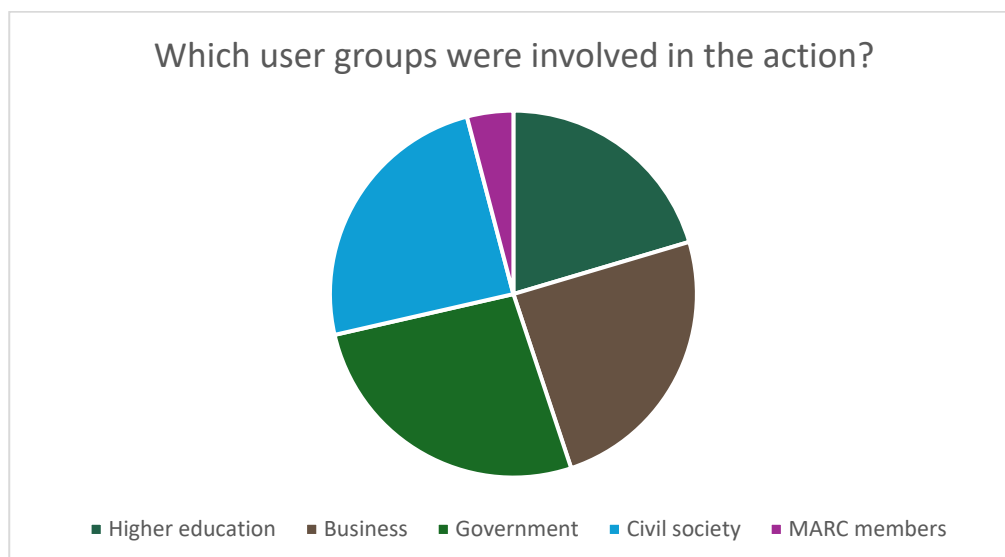


Figure 22: User groups involved in the beta testing of the ROBIN Toolbox overall.

Stakeholders involved in the beta testing were also asked to fill a feedback questionnaire. We received 51 feedback from all user groups: Government stakeholders (19), Higher education and research (14), Business (6) and Civil Society (5) and other (7).

Higher education, business and government stakeholders tested all toolbox components. The two most tested tools by higher education and government were the CBGMC (respectively 7 & 10) and the KP (respectively 5 & 12), whereas for business stakeholders, it was the CBGMC (3), the KP and EPPT (2). All stakeholder types tested the CBGMC.

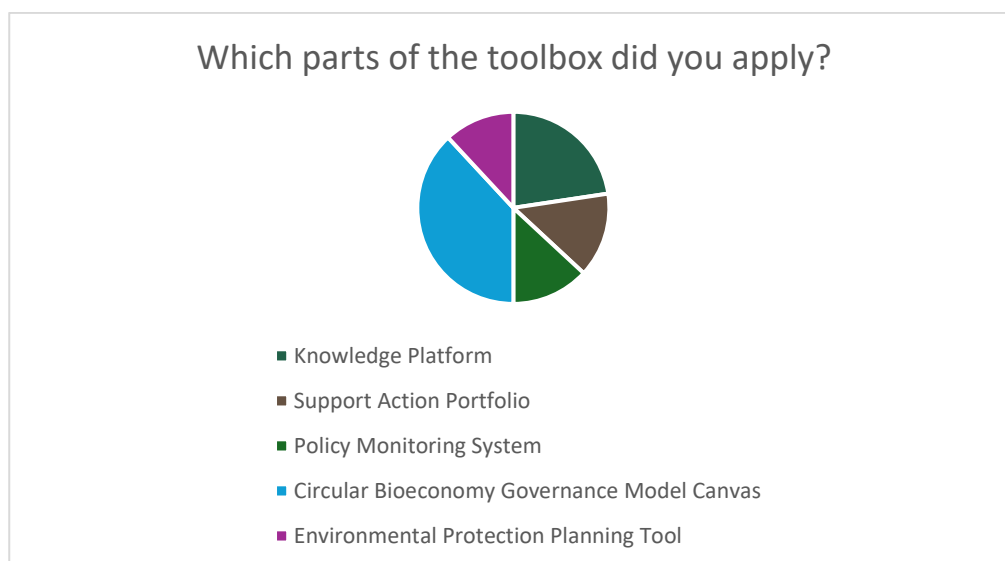


Figure 23: Toolbox components tested by external stakeholders involved in the beta testing

In summary, even though the ROBIN beta testing provided a smaller dataset compared to alpha testing, it nevertheless allowed the project to gather useful input and draw meaningful conclusions on the performance of the components of its toolbox and potential areas of improvement.

As in the previous section on alpha testing results, we will now provide an overview of the results from beta testing, the conclusions drawn from them, and the steps taken to address the feedback received.

5.2 User experience and functionality

In the beta testing, the validation questionnaire for partners did not contain any question about user experience and functionality of the Toolbox (e.g. whether the design of the toolbox components were user-friendly and intuitive) and whether the website was easy to use and navigate since the results from alpha testing were satisfactory. These aspects were only asked to external stakeholders. On average, they found the design and user-friendliness of the toolbox good (7,96) with a highest positive rating from civil society (8,8) and business (8,5) and a lowest rating from others (6,42). As regards the guidance provided on how to use the Toolbox and its component, the vast majority of the stakeholders (94%) found it helpful and sufficient.

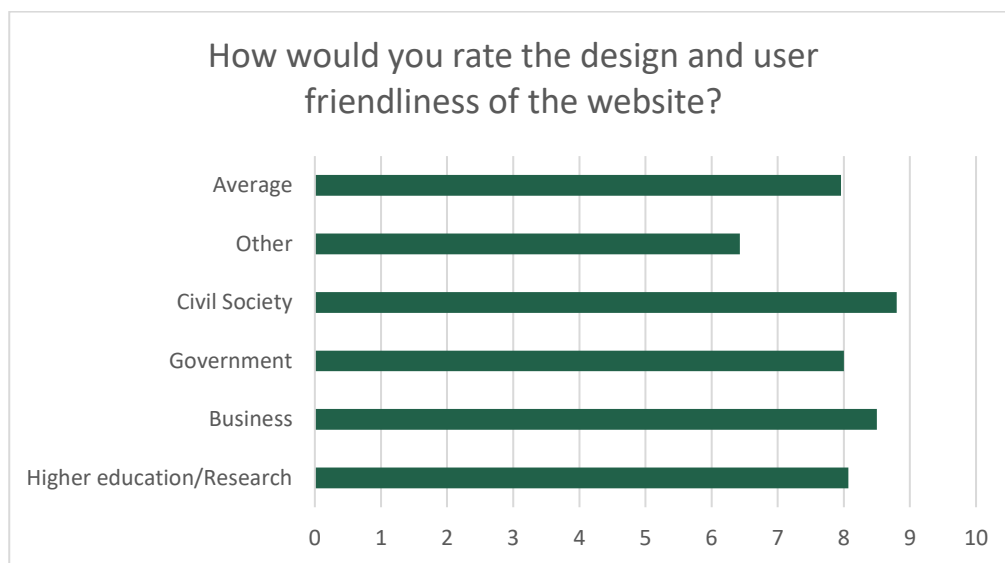


Figure 24: Rating of the design and user friendliness of the Toolbox website by external stakeholders involved in the beta testing

Partners were asked whether they were satisfied with the changes made to the tested toolbox components (EPPT, CBGMC, PMS and its progress tracker) during the update of the Toolbox and all respondents answered positively (100%).

5.3 Relevance and quality

To assess the relevance and quality of the Toolbox partners were asked after every validation action if the toolbox component was relevant and efficient to meet the unique challenges and opportunities of their region. There was in total only one negative rating (PMS). In reaction to a negative rating the project partners were asked to provide an explanation. Here is the explanation: The value chain aspect is missing (PMS).

The stakeholders' assessment provides a similar picture: they rated the Toolbox highly in terms of its quality (8,11), relevance (7,92) and found it helpful (8,7) although some differences could be noticed among the stakeholder types.

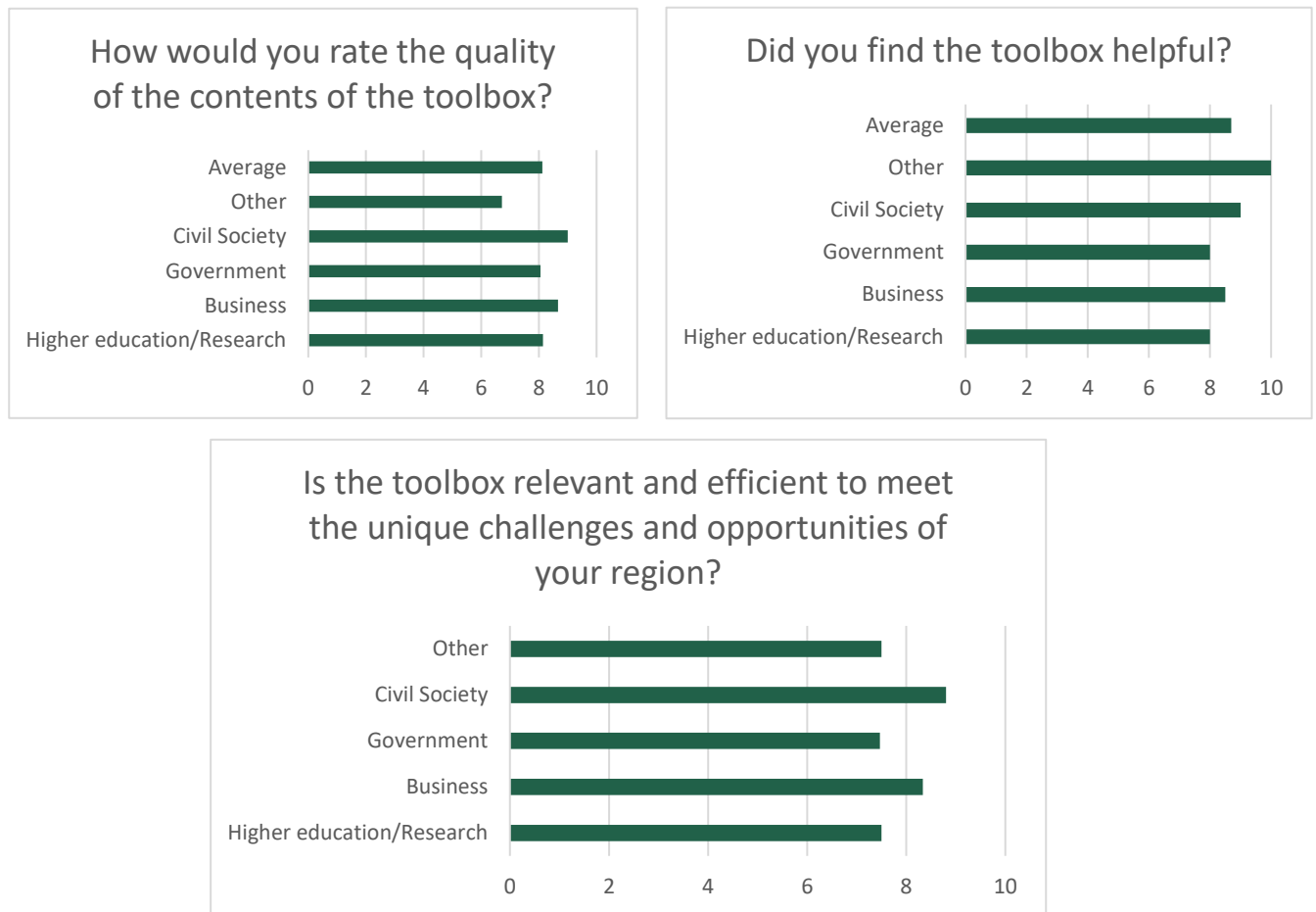


Figure 25: Rating of the quality, relevance and helpfulness of the Toolbox by external stakeholders involved in the beta testing

Stakeholders were also asked about the relevance of the Toolbox for their work and whether they would recommend its use to colleagues, contacts, networks. In terms of work relevance, stakeholders answered with an average of 7,63 with a highest rating from business stakeholders (8,33), followed by civil society (8), higher education and research (7,92) and government (7,63). The lowest rating came from other stakeholders. This is fully understandable since the ROBIN Toolbox has been devised for specific types of stakeholders.

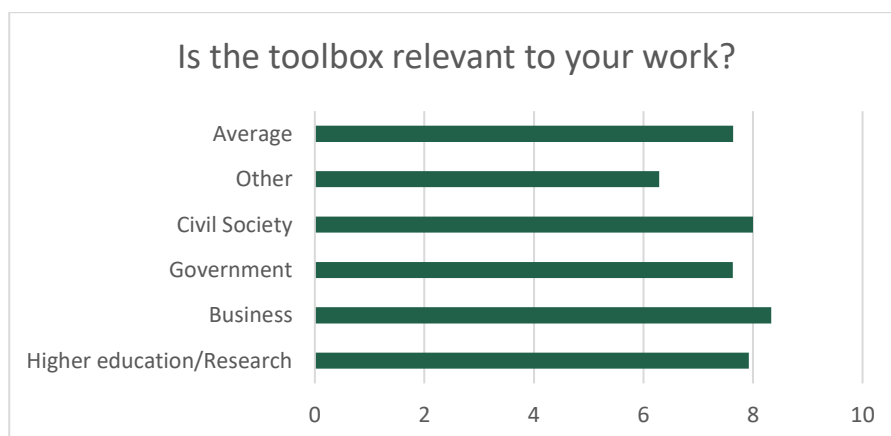


Figure 26: Relevance of the Toolbox for stakeholders' work (beta testing)

The very positive rating (8,4) of stakeholders regarding whether they would recommend the use of the Toolbox to colleagues, contacts, networks. This time the highest rating came from the civil society

(9), followed by business (8,83), higher education (8,14) and government (8,31). Again, the lowest rating came from other (7,71).

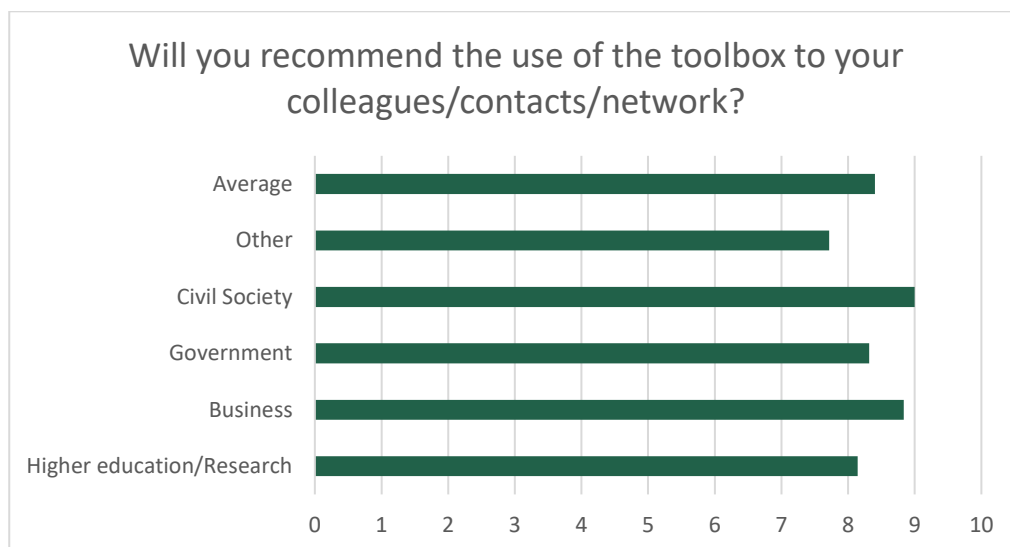


Figure 27: Toolbox use recommended by stakeholders in beta testing

In summary, the beta testing strengthened the conclusions that **the Toolbox can be of interest to all stakeholder groups** (government, business, higher education, civil society), **is best suited for governance, business stakeholders & higher education, and is highly relevant to meeting the challenges** the regions are facing in transitioning to a sustainable circular bioeconomy. A new insight is that **most stakeholders would recommend the Toolbox**.

5.4 Impact

To assess the impact of the Toolbox partners were asked after every validation action i) how relevant the applied toolbox component was for the success of the activity, and ii) how likely the adoption and continued use of the Toolbox is after the project has ended.

The **relevance of the toolbox components for the success of the validation actions was in general evaluated positively** with an overall average of 84,5%. Best evaluated was the EPPT (100%), followed by the KP (95%), the CBGMC (82,5%), the SAP (83,3%) and the PMS (70%). The lower score of the PMS reflects noticeable variations between regions with a perfect rating in Greece (100%) and lower ratings in Germany (50%) and Ireland (60%).

These numbers show that the validation actions were in general well designed and suited to the toolbox components. Furthermore, it confirms that the Toolbox can add value and support the regions in carrying out support actions towards the establishment of a sustainable circular bioeconomy.

When analysing the feedback on the **likelihood of continued adoption and application of the Toolbox** a remarkably similar picture emerged. The likelihood was **in general pronounced to be high** with an average of 80%. The KP and EPPT received the highest score (90%), followed by the CBGMC (82%), the SAP (80%) and the PMS (60%). The results of beta testing confirms the **connection between the relevance of a toolbox component to the success of activities in a specific region and its likelihood of continued application**.

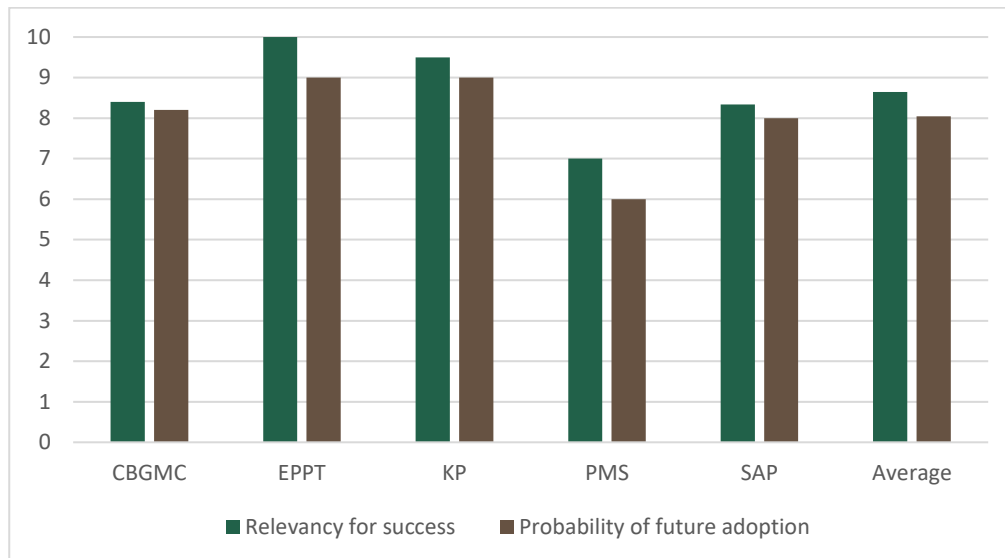


Figure 28: Relevancy for success and Probability of future adoption of the ROBIN tools after beta testing

Business and civil society stakeholders scores were the highest regarding the likelihood to use the Toolbox in the future with 86,6% and 82%.

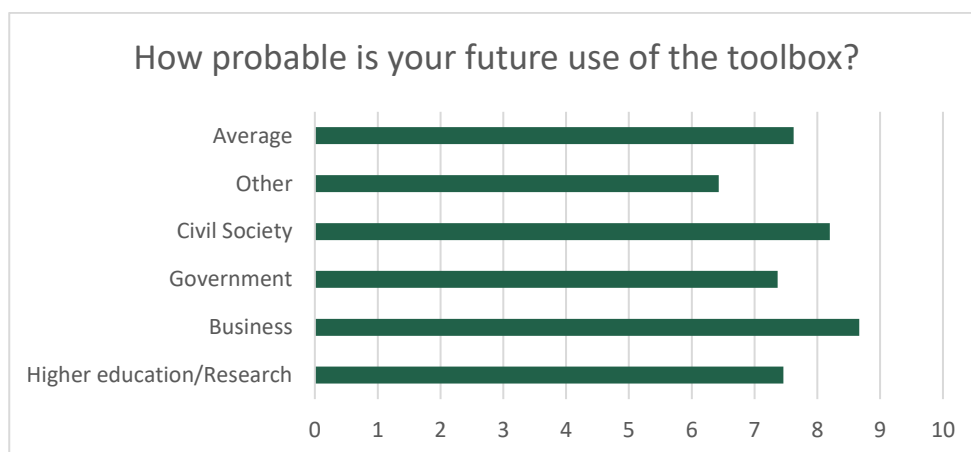


Figure 29: Likelihood of Toolbox use in the future by stakeholders from beta testing

As a summary, the results of the beta testing confirm findings from the previous testing: **There is a need for the Toolbox as well as a readiness to adopt new tools, however it is important to demonstrate the added value of such tools to stakeholders clearly.**

Based on the results of beta testing, **three main areas of improvement during the beta update** were identified: **1) Improvement of user guidelines, 2) content & use, and 3) Filtering & search options.** All tool owners were asked to consider the received feedback, decide on plans for addressing them, and carry out the necessary changes. Task leader S2i provided a reporting template to record the progress made.

5.5 Knowledge Platform

5.5.1 Feedback collected and other insights

In addition to answering the general questions on relevance, efficiency, and impact of the knowledge Platform, partners also answered several specific questions.

As the Knowledge Platform is made up of two components: the collection of Governance Models and the collection of Good Governance Practices partners were asked whether they used one or the other or both collections in their validation actions. In all cases (2), both collections were used, showing that both are of equal interest and relevance.

5.5.2 Updates and improvements

The analysis of the results were provided to the tool owners AUTH and MTU. MTU added 11 additional good practices to the Knowledge Platform including 5 good practices from Spain, 1 from Slovakia, 1 from North Macedonia, 1 from Romania, 1 from Germany, 1 from Portugal and 1 from Hungary.

Below are AUTH's and MTU's implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
Comments regarding the search button (both on Governance Models and Good practices) – i.e. a) Attach key word search function, b) Improved searchability, and c) Key word search would be a useful addition for the case studies.	We will make improvements to the search button in order to improve the user interface and user experience as well as searchability.	The search button was improved and updated.
Add more practices on the knowledge platform (regarding the Good practices)	Additional Good Practices will be added with the goal of arriving at a number around 30 good practices in total (i.e. 10 more case studies regarding Good Practices).	Additional case studies were added in the Good Practices section.

Table 16: Updates and improvements made to the Knowledge Platform (beta testing)

5.6 Support Action Portfolio

5.6.1 Feedback collected and other insights

In addition to answering the general questions on relevance, efficiency, and impact of the SAP, partners also answered several specific questions: which types of measure was most relevant to the action; which support action(s) was used; whether satisfied with the changes made to the portfolio during the update.

The SAP contains 46 support actions that are categorized as i) Regional Analysis Measures, ii) Social Measures, and iii) Technical Measures. Although all three types of measures were used

during beta testing, the regional analysis measures were the only ones that were used systematically this time.

Out of the 46 support actions in the portfolio 16 were applied at least once during beta testing. 5 measures were used twice “Analysis Of Biomass Resources And Potential”, “Analysis Of Regional Financing Opportunities (Private Initiatives)”, “Analysis Of Regional Funding Mechanisms And Instruments (Public Level)”, “Analysis Of Relevant Regional Strategies And Legislation” and “Stakeholder Engagement: Local Authorities”.

All respondents were satisfied with the changes made during the update of the tool after alpha testing.

5.6.2 Updates and improvements

The analysis of the results were provided to the tool owner CTA.

Below are CTA’s implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
Typology matrix not linked to the Support Actions but with the governance models	The typology matrix would be better located under the Knowledge Platform section	Typology matrix changed

Table 17: Updates and improvements made to the Support Action Portfolio (beta testing)

5.7 Circular Bioeconomy Governance Model Canvas

5.7.1 Feedback collected and other insights

In addition to answering the general questions on relevance, efficiency, and impact of the CBGMC, partners also answered whether they are satisfied with the changes made. All responses were positive.

5.7.2 Updates and improvements

The analysis of the results were provided to the tool owner MTU who was responsible for the update of the CBGMC.

Below are MTU’s implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
Tie canvas more closely to regional activities, governance model, best practices, and innovations	Include reference/link to the Knowledge Platform Tool in the guidance document and user guidelines to help inspire users when completing the canvas.	“Additional Resources” with a link to Knowledge Platform to be incorporated in the guidance document and a link to Knowledge Platform to be incorporated in the user guidelines to guide and inspire users and moderators.

User unfamiliarity with toolbox	Making the guidance document more visible and accessible from the Canvas toolbox homepage (e.g., a “Need Help?” button).	“Need Help? button to Download the Canvas Guide” can be added to improve onboarding support.
Request for filled-in examples of the canvas	Include reference link to D2.1 in the guidance document and in the User Guidelines for examples of canvas from regional workshops. This report includes examples from the five ROBIN regions see figures: Fig.17 Spain, Fig.23 Germany, Fig.30 Greece, Fig.38 Ireland, Fig.42 Slovakia. The report provides additional context and inspiration for the setting up of CBGMC co-creation workshops.	Link to D2.1 included in the guidance document and in the User Guidelines to help users.

Table 18: Updates and improvements made to the Circular Bioeconomy Governance Model Canvas (beta testing)

5.8 Policy Monitoring System

5.8.1 Feedback collected and other insights

In addition to answering the general questions on relevance, efficiency, and impact of the PMS, partners also answered whether they were satisfied with the changes made to the tool as well as to the progress tracker. All responses were positive to both questions.

5.8.2 Updates and improvements

The analysis of the results were provided to the tool owner AUTH.

Below are AUTH's implemented improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
<p>1. A) The guidelines should come first, followed by the fields. You automatically click on the fields and don't understand them. It wasn't until I saw the instructions later that I figured it out.</p> <p>B) Regarding the content, I think it's a major shortcoming: there's no indication of how to proceed with the data search. Is there (and in some cases, there is) data from the JRC?</p> <p>C) A very short manual explaining how the selection was made</p>	<p>A) This is not relevant to the PMS since it does not include the guidelines in the form of dropdown (expanding on click).</p> <p>B) The PMS includes data from the JRC and it is mentioned in its webpage.</p> <p>C) The selection is also mentioned in the deliverable, the address of which is also mentioned in the PMS webpage.</p>	<p>There is some confusion regarding the PMS usage even though all the information which caused it is already visible.</p> <p>To address comments 1.B) and 1.C) we reordered the components of the PMS webpage.</p>

would also be very helpful. (PMS or EPP)		
<p>2. During beta testing we witnessed increased satisfaction from stakeholders with the move away from the binary choices of 'not applicable', 'in progress' and 'completed' to reflect the aspirations of policymakers who recognised the desirability of including certain elements of the 'suggestions for improvement' with the addition of the option 'applicable but not initiated'. This allows greater flexibility to positively influence policymaking and to obtain a more holistic score.</p> <p>Stakeholders who expressed an opinion remain dissatisfied with the usefulness of the scoring increments as presented, with one respondent expressing the view that the scoring needs to be customisable to individual requirements and are too rigid as an indicator as constituted.</p> <p>Tracker/excel file: it is not possible to include comments, remarks or details</p>	<p>Making the tracker's scoring system customizable translates to unlocking the file. This action cannot be implemented since the file needs to remain locked to safeguard its usability. Furthermore, it provides a clear baseline for less advanced (in their policymaker steps) users.</p>	No further actions.
3. Also, it would be helpful to explain/show the user how to proceed when searching for data + provide sources where to find relevant data	This is already mentioned in the PMS' webpage.	Completing changes on comment 1 will address this
4. The tracker is at the moment at the very end of the page and it gets lost - many users did not see it. It should appear way earlier / at the top	There is still some confusion regarding the components of the PMS and their order of usage	Completing changes on comment 1 will address this.
5. Inconsistency in the use of the name: is it policy monitoring tool (PMT) or policy monitoring system (PMS)?	<p>There are indeed inconsistencies regarding the name of the system. The whole page is the Policy Monitoring System which is comprised of:</p> <ol style="list-style-type: none"> 1. The Policy Monitoring Tool which includes all the information needed to understand the indicators, their analysis, their metrics etc. 2. The Policy Monitoring Tracker which is an additional tool to assist with the 	Clearer titles will be added to address this comment.

	progress of the indicators considered in the policymaking process of each individual.	
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Table 19: Updates and improvements made to the Policy Monitoring System (beta testing)

5.9 Environmental Protection Planning Tool

5.9.1 Feedback collected and other insights

In addition to answering the general questions on relevance, efficiency, and impact of the EPPT, partners also answered whether they were satisfied with the changes made to the tool. All responses were positive. The single feedback received for the EPPT concerned improving **user guidelines**.

5.9.2 Updates and improvements

The analysis of the results were provided to the tool owner QPL.

Below is QPL's plan for addressing the suggested improvements.

Area of Improvement	Plan for addressing the area	Changes carried out
Guidelines to use the Environmental Protection Plan tool	Apart from the written guidelines and the training video, we have now added an example (or case study) of how to use the EEPT. After elaborating on the feedback we got from the beta testing, we trust that this addition will help potential users understand better how the tool works.	After discussions with one of the ROBIN partners (RCM), we decided to add as an example the Excel that they filled out earlier in the project together with local stakeholders as one of their validation actions. This online example will help users to complete their own EPP for their area and also to take ideas on how to improve the environmental performance of some indicators.

Table 20: Updates and improvements made to the Environmental Protection Planning Tool (beta testing)

6. Roadmaps for using the Toolbox

The final digital version of the ROBIN Toolbox is available under <https://robintoolbox.web.auth.gr/>. In this latest version, each tool and Toolbox component has been updated at least twice. In addition, the Toolbox homepage has been finetuned as well: Minor changes were made to fix some inconsistencies or unclarity and further increase the user-friendliness of the interface.¹ Each tool as well as the Toolbox is protected under copyright but can be used for free. The **ROBIN Toolbox will be available after project completion**.

The [User Guidelines](#) provide users with information regarding what tool(s) or Toolbox component(s) to use for their respective need/stage: e.g. when developing policy monitoring, determination of funding schemes or opportunities to support bioeconomy governance projects, by developing bioeconomy governance models, etc.

6.1 Usage roadmaps

The ROBIN Toolbox offers structured pathways for developing and implementing circular bioeconomy governance models, tailored to various stages of policy development and implementation. These usage roadmaps are designed to assist regional authorities and stakeholders in effectively navigating the transition to a circular bioeconomy. By following these structured roadmaps, regions can systematically develop, implement, and refine their circular bioeconomy governance models, ensuring alignment with best practices and regional objective(s).

1. Initiating Bioeconomy Governance Models

For regions at the early stage of establishing bioeconomy governance structures, we recommend:

- **Exploring the ROBIN Knowledge Platform:** This platform provides insights into various governance models and showcases good practices, serving as foundational resources for new initiatives.

2. Implementing Bioeconomy Governance Models

Regions actively deploying their governance models can benefit from:

- **Using the Circular Bioeconomy Governance Model Canvas, the Policy Monitoring System, and the Environmental Protection Planning Tool** that offer practical support during implementation phases.
- **Using the Support Actions Portfolio:** This curated list of support actions provides tailored strategies to address specific regional needs and challenges.

3. Monitoring and Evaluating Governance Performance

To assess and improve the effectiveness of existing governance models, we suggest:

- **Engaging with the Policy Monitoring System and Environmental Protection Planning Tool** that are designed to facilitate ongoing evaluation and highlight areas for improvement.

¹ The description of the initial Toolbox is available in another report ([D2.3](#)).

4. Seeking Inspiration and Best Practices

For stakeholders aiming to enhance their governance approaches, we recommend:

- **Reviewing the Good Practices Section** as this resource compiles successful regional initiatives that encourage social innovation and promote circular bioeconomy business models.

5. Exploring Case Studies

For in-depth analyses of successful regional models, we recommend:

- **Consulting the Knowledge Platform** as the case studies and reports provide valuable lessons and replicable strategies.

6. Policy Monitoring Support

To ensure that policies are effectively tracked and assessed, we recommend:

- **Using the Policy Monitoring System Tool** as it aids in the systematic evaluation of policy implementation and outcomes.

7. Environmental Protection Planning

For regions focusing on ecological considerations, we suggest:

- **Employing the Environmental Protection Planning Tool** that is designed to identify and mitigate non-eco-friendly practices within regional authorities.

6.2 User roadmaps

Based on the testing, we can also define user roadmaps to facilitate the development and implementation of circular bioeconomy governance models for various stakeholders. By following these stakeholder-specific roadmaps, each group can effectively contribute to and benefit from the transition to a circular bioeconomy, leveraging the resources provided by the ROBIN Toolbox.

Government authorities:

Objective: To design and implement effective governance frameworks that support circular bioeconomy initiatives.

Step 1: Assess Current Governance Structures

- Use the **Typology Matrix** to evaluate existing governance models and identify areas for improvement.

Step 2: Explore Best Practices

- Review the **Good Practices** section to learn from successful regional initiatives that have promoted social innovation and circular bioeconomy business models.

Step 3: Develop Action Plans

- Engage with the **Circular Bioeconomy Governance Model Canvas** to create comprehensive action plans tailored to regional needs.

Step 4: Monitor and Evaluate Policies

- Implement the **Policy Monitoring System** to track the effectiveness of policies and make data-driven adjustments.

Businesses:

Objective: To integrate circular bioeconomy principles into business operations and value chains.

Step 1: Identify Opportunities

- Access the **Support Actions Portfolio** to find strategies that align with business objectives and regional bioeconomy goals.

Step 2: Collaborate with Stakeholders

- Join/Participate in clusters, networks or **Multi-Actor Regional Constellations** to engage with government, academia, and civil society for collaborative project development.

Step 3: Implement Best Practices

- Adopt methodologies from the **Good Practices** repository to enhance sustainability and innovation in business models.

Step 4: Evaluate Environmental Impact

- Use the **Environmental Protection Planning Tool** to assess and mitigate non-eco-friendly practices within operations.

Higher Education and Research Institutions:

Objective: To contribute to knowledge creation and dissemination supporting circular bioeconomy transitions.

Step 1: Conduct Governance Research

- Use the **Knowledge Platform** to study various governance models and contribute to their evolution.

Step 2: Develop Educational Programs

- Incorporate findings from the **Good Practices** into curricula to educate future professionals on circular bioeconomy.

Step 3: Engage in Collaborative Projects

- Join clusters, networks or **Multi-Actor Regional Constellations** to work alongside other stakeholders to co-create and test innovative governance models.

Step 4: Monitor Policy Impacts

- Apply the **Policy Monitoring System** to evaluate the societal and environmental impacts of implemented policies.

Civil Society Organizations:

Objective: To advocate for and participate in the development of inclusive and community-focused circular bioeconomy initiatives.

Step 1: Learn from Existing Initiatives

- Explore the **Good Practices** repository to identify and understand successful community-driven bioeconomy projects/initiatives.

Step 2: Participate in Stakeholder Networks

- Engage with **Multi-Actor Regional Constellations** to represent community interests and collaborate on governance model development.

Step 3: Use Support Tools

- Use the **Support Actions Portfolio** to identify resources and strategies that can be helpful for community-led initiatives.

Step 4: Monitor Environmental Practices

- Use the **Environmental Protection Planning Tool** to identify and address environmentally harmful practices in the community.

7. Conclusions and Next Steps

ROBIN digital Toolbox provides practical information and tools for regional authorities to develop or improve their bioeconomy regional governance models. The Knowledge Platform (KP) serves as a comprehensive repository of circular bioeconomy governance models and practical strategies. The three tools – the Circular Bioeconomy Governance Model Canvas (CBGMC), the Policy Monitoring System (PMS), and the Environmental Protection Planning Tool (EPPT) – empower regional policymakers with co-design capabilities, governance assessments, and environmental planning solutions. Finally, the Support Action Portfolio (SAP) further enhances the Toolbox, offering regions inspirational examples and capacity-building measures.

As shown in this report, our approach ensured not only multiple testing (alpha and beta testing) but also a broad testing base (both in terms of stakeholder types and regional coverage) of the Toolbox. All toolbox components were validated by different stakeholder types from various European regions. The feedback from both testing phases provided a strong dataset that allowed the tool owners to improve iteratively their respective tools and the Toolbox as a whole. The testing and validation process ensured that the Toolbox is not only user-friendly but also tailored to the specific needs and challenges of the bioeconomy policy field.

Here are **insights from the whole testing and fine-tuning process**:

- It is a challenge to be specific enough in order for the information to be comprehensible while remaining broad enough to appeal to a wide range of different stakeholders/users
- The User Guidelines were well received as they support the accessibility of the Toolbox.
- There is a need for the Toolbox as well as a readiness to adopt new tools, however it is important to demonstrate the added value of such tools to stakeholders clearly.
- A platform gathering all existing tools relevant for the development, implementation and monitoring of bioeconomy strategies would be extremely useful. Many (European) projects develop tools and there are already plenty of useful tools available. It would be helpful to have a single place where to find them, to get information about/ compare what they can do so that stakeholders can pick and choose the most suitable tool for their planned activities.
- There was a significant connection between the relevance of a Toolbox component to the success of activities in a specific region and its likelihood of continued application. This shows the importance of tailoring activities well in order to make the most of the ROBIN tools.

The **next steps** now are to

- Continue/improve the promotion of the ROBIN Toolbox so that all EU regions are informed about it;
- Keep updating the Toolbox and maintain the Homepage.



DEPLOYING CIRCULAR BIOECONOMIES AT
REGIONAL LEVEL WITH A TERRITORIAL APPROACH

About the project

Europe's regional authorities have a crucial role to play as agents of inclusive and resilient economic development for their territories. ROBIN sets out to empower them to fulfil this role with support to co-shape their governance structures in to accelerate the deployment of their circular bioeconomy targets, while also promoting social innovation. We demonstrate the potential of innovative circular bioeconomy governance structures and models in 5 regions within Ireland, Germany, Spain, Slovakia and Greece. We set-up Multi-Actor Regional Constellations engaging key stakeholders to co-create novel governance structures, well-embedded within existing structures of our regions and mandated to execute circular bioeconomy strategies and to coordinate effectively with the Circular Cities and Regions Initiative – Coordination and Support Office (CCRI-CSO). We also provide them with tailored support for enhanced stakeholder engagement, as well as a practical toolbox to improve the operation and monitoring of their models. In the process we coordinate our actions with the CCRI-CSO.

Partners	URL
Q-PLAN INTERNATIONAL ADVISORS PC	www.qplan-intl.gr
FUNDACION CORPORACION TECHNOLOGICA SE ANDALUCIA	www.corporaciontecnologica.com
WHITE RESEARCH SRL	www.white-research.eu
PEDAL CONSULTING SRO	www.pedal-consulting.eu
STEINBEIS 2I GMBH	www.steinbeis-europa.de
ROZVOJOVA AGENTURA ZILINSKEHO SAMOSPRAVNEHO KRAJA NO	www.razsk.sk
MUNSTER TECHNOLOGICAL UNIVERSITY	www.circbio.ie
ARISTOTELEIO PANEPISTIMIO THESSALONIKIS	www.auth.gr
REGION OF CENTRAL MACEDONIA	www.pkm.gov.gr
CONSEJERÍA DE AGRICULTURA, PESCA, AGUA Y DESARROLLO RURAL	www.juntadeandalucia.es
INSTITUTO ANDALUZ DE INVESTIGACION Y FORMACION AGRARIA PESQUERA ALIMENTARIA Y DE LA PRODUCCION ECOLOGICA	www.juntadeandalucia.es
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