BioINSouth

Supporting regional environmental sustainability assessment for the BIO-based sectors to improve INnovation, INdustries and INclusivity in SOUTH Europe

Deliverable 2.2

Multi-Actor stakeholders approach framework

- Cyprus
- Czech Republic
- France
- Greece
- Portugal
- Italy
- Slovenia
- Spain
- Türkyie

Bio-based Industries Consortium

Circular Bio-based Europe Joint Undertaking

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BioINSouth

Supporting regional environmental sustainability assessment for the BIO-based sectors to improve INnovation, INdustries and INclusivity in SOUTH Europe

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ABBREVIATIONS	MEANING
SH	stakeholder
VC	value chain
MAA	multi-actor approach
MARG	multi actor regional group
QH	quadruple helix
BSP	BioINSouth Stakeholder Platform

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1 Executive summary

The **BioINSouth project** is a transformative initiative aimed at embedding sustainability and circularity into the heart of regional bioeconomy strategies across Southern Europe. At its core lies a **Multi-Actor Approach (MAA)**—a collaborative framework that brings together stakeholders from academia, industry, government, and civil society (the **Quadruple Helix**) to co-create solutions tailored to regional needs.

Recognising the diversity and complexity of Southern Europe's ecological and socio-economic landscapes, BioINSouth has developed a robust **stakeholder engagement strategy**. This strategy is grounded in comprehensive **stakeholder mapping**, which identifies and categorises key actors across eight regions: Andalusia, Asturias, Campania, Centro, Cyprus, Nouvelle-Aquitaine, Peloponnese, and Slovenia.

To operationalise this, the project established **Multi-Actor Regional Groups (MARGs)** and a centralised **BioINSouth Stakeholder Platform (BSP)**. These structures are designed to foster dialogue, build trust, and facilitate knowledge exchange. The BSP serves as a digital hub where stakeholders can access resources, participate in discussions, and contribute to shaping regional bioeconomy policies.

The mapping process, led by PNO Innovation (Greece), employed advanced tools like **Wheesbee**, a big data analytics platform, to scan over **12,000 EU and national projects**, resulting in the creation of a suite of **comprehensive stakeholder databases**. These include a **Global Stakeholder Database**, seven **National/Regional Databases**, and a **Linked and Sister Projects Database**. Together, they form a foundational asset for the project—offering a living, evolving map of the bioeconomy landscape in Southern Europe. These databases not only identify key actors and their roles across value chains but also enable precise regional targeting, support evidence-based decision-making, and foster cross-border collaboration. By capturing the dynamic interplay of stakeholders, funding trends, and innovation ecosystems, they empower regional HUBs and MARGs to tailor engagement strategies, identify synergies, and scale successful models. As such, the databases are not just tools—they are strategic enablers of BioINSouth's mission to catalyse a resilient, inclusive, and regionally grounded bioeconomy.

Importantly, the report underscores the evolving policy context, including the shift of bioeconomy responsibilities from **DG Research & Innovation to DG Environment**, signaling a stronger emphasis on environmental outcomes. This transition reinforces the need for inclusive, regionally grounded strategies that align innovation with sustainability.

In essence, this deliverable lays the groundwork for a **living ecosystem of collaboration**, where regional actors are not just participants but co-architects of a sustainable bioeconomy future.

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2 Introduction

2.1 Stakeholder mapping to support the BioINSouth Multi-Actor Approach

The BioINSouth project aims to support decision-makers to incorporate considerations of ecological limits into their regional bioeconomy strategies and roadmaps, in relation to circular and/or bio-based activities, in Southern Europe. The main objectives of the project are:

1. Developing new, or improve existing methodologies and digital tools for the assessment of environmental impacts and circularity of bio-based systems, concerning:
    a. Estimations on the market growth of bio-based chemicals, ingredients, and materials
    b. Biomass availability requirements for chemicals, polymers and materials
    c. Assessment of impacts on food security, land use, land use change, forestry, biodiversity and ecosystems integrity
2. Constructing an integrated toolkit to include digital tools, methodologies and guidelines to support decision – makers to incorporate considerations of ecological limits into regional bioeconomy strategies and roadmaps
3. Designing an effective regional monitoring system applicable to various bioeconomy sectors in the context of Southern Europe, to ensure a wider geographical impact of project results
4. Demonstrating the use of the integrated toolkit, while performing analyses of regional policies
5. Co-developing policy recommendations for sustainability and circularity in industrial bio-based systems for strengthening integration into regional bioeconomy strategies
6. Ensuring wide visibility and replication of the BioINSouth experience and results.

The crucial element in the BioINSouth concept is its regional approach, through the formation of eight bioeconomy HUBs in the following regions[1]:

1. **Andalusia (Spain)**
2. **Asturias (Spain)**
3. **Campania (Italy)**
4. **Centro (Portugal)**
5. **Cyprus**
6. **Nouvelle-Aquitaine (France)**
7. **Peloponnese (Greece)**
8. **Slovenia**

Within these regions, stakeholder engagement will be achieved by:

- Setting up the Multi-Actor Regional Groups (MARGs) by involving at least eight stakeholders of the Quadruple Helix, per region
- Establishing the BioINSouth HUBs in each of the eight regions by providing guidelines for their action plan and mobilisation

[1] In the cases of Cyprus and Slovenia, due to small size the whole countries participate in the regional HUBs

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Therefore, the BioINSouth strategy revolves around the Multi-Actor Approach (MAA) emphasising in the synergies and engagement among cross-disciplinary stakeholders, promoting cooperation among actors in diverse bioeconomy related value chains (VCs).

The BioINSouth MAA envisages to engage SHs and actors in the bioeconomy sector in South Europe, by understanding their needs, the individualities of each Southern region and the relation with the bioeconomy VCs implemented in the region. In addition, the MAA through targeted regional actions and planning (see D2.1) will enable dialogue, capacity building, co-creation, opportunities for bioeconomy development, in real scenarios through the hubs, promoting innovative business models for strengthening bioeconomy VCs and impact in Southern Europe.

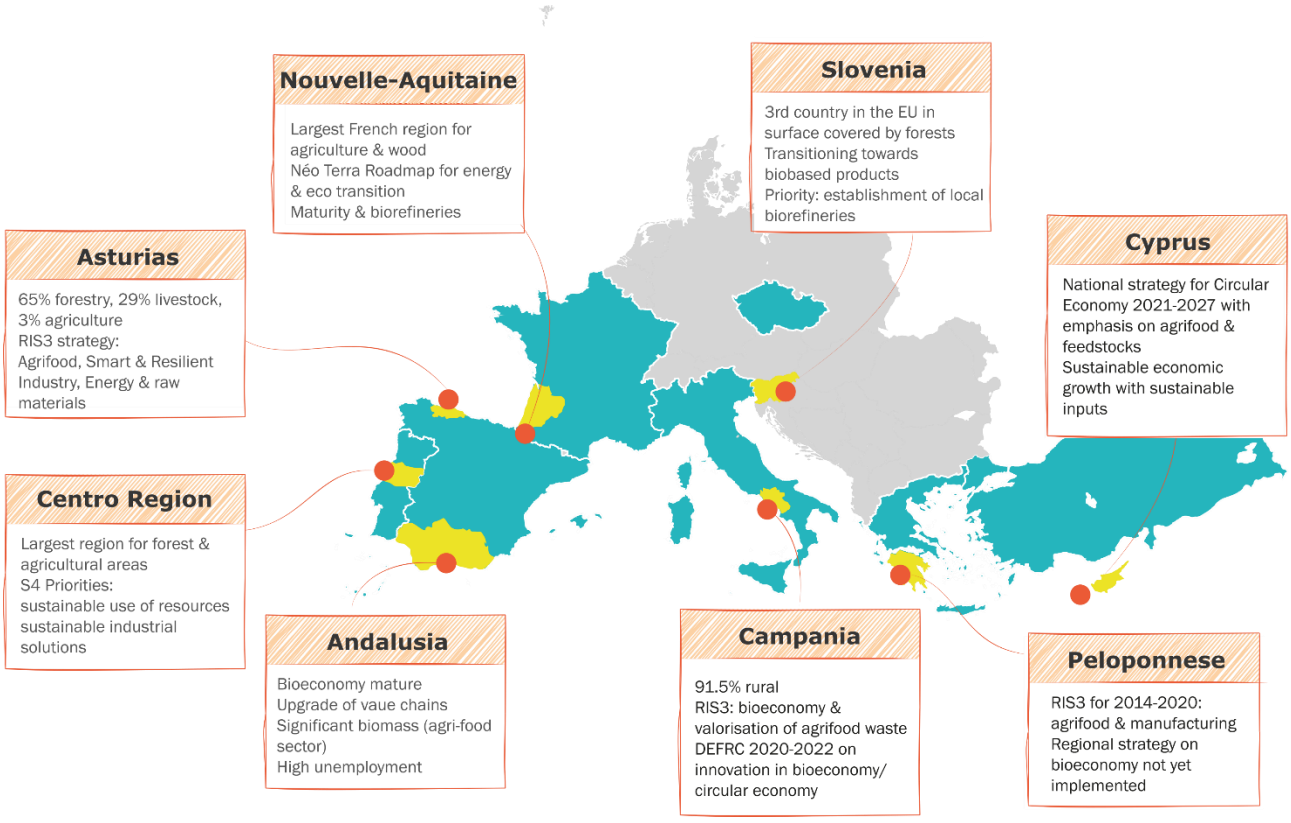

Figure 1 The eight BioINSouth regions and brief outline of bioeconomy status

In this context, the initial step in establishing the multi-actor framework within BioINSouth was the formation of the Multi Actor Regional Groups (MARGs). These groups are composed of representatives from at least eight relevant quadruple helix stakeholders per region, including local governments, the business community, academic institutions, the private sector, and civil society (with at least one representative from each category) connected to the bioeconomy sector. The BioINSouth MARG Members will provide their expertise on the requirements and challenges currently faced by the BioINSouth stakeholder groups. They will also offer valuable feedback on the concepts, initial steps, and outcomes of the project's activities.

The regional MARG members will form the basis of the BioINSouth SH Panel, that will expand throughout the duration of the project by deploying tools like the SH mapping and analysis, and the BioINSouth SH Platform implemented in T2.3 and elaborated in this Deliverable (D2.2).

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2.2 Executive summary and overview

A SH engagement strategy is crucial for the BioINSouth project due to the diverse needs and challenges of Southern European regions, including the Mediterranean. Parameters to consider include:

- **Regional Diversity and Specific Needs:** each region has unique ecological, economic, and social contexts, requiring tailored approaches for effective outcomes.
- **Inclusive and Comprehensive Approach:** engaging a broad range of actors and stakeholders ensures all relevant voices are heard, fostering a holistic approach to bioeconomy development in regional/national level.
- **Enhancing Policy Coordination:** improved communication and collaboration align regional policies with EU objectives, addressing environmental challenges and enhancing resource efficiency.
- **Building Trust and Ownership:** early stakeholder engagement builds trust and a sense of ownership, increasing support and active participation.
- **Facilitating Knowledge Transfer and Best Practices:** regular workshops, forums, and outreach activities enable regions to share experiences and adopt successful strategies, accelerating progress.
- **Addressing Regional Challenges and Opportunities:** leveraging local knowledge helps tackle specific challenges like climate change and resource scarcity, while identifying regional opportunities.
- **Ensuring Long-Term Sustainability:** continuous dialogue and collaboration create a supportive environment for the long-term adoption of bioeconomy strategies, ensuring sustained benefits beyond the project's duration.

The SH mapping aims at providing a comprehensive overview of the SHs and actors in the field of bioeconomy and circular bioeconomy, relevant to the regional aspects of BioINSouth, in order to create an inventory of SHs that can potentially be assimilated in the activities of the project and the MMA actions planned throughout the duration of the project, concerning the established MARGs and HUBs. This will include:

- Collection of data to understand the needs, preferences, constraints of the bioeconomy VCs in the BioINSouth regions
- Gather insights for the potential complications and barriers that limit the replication of the BioINSouth MMA in other countries or regions
- Co-develop briefs and policy recommendations for the R&I priorities in regional level that will enhance the implementation of bioeconomy in South Europe.

The SH mapping and subsequent analysis of the landscape is an integral part of the BioINSouth project implementation, while this report will provide a white paper in the bioeconomy SH composition in the target regions of South Europe.

The BioINSouth SH inventory is designed to provide twofold information on:

- The classification of the variety of SHs based on type of organisation (e.g. industries, policy makers, research community, civil society) with respect to the QH model

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- Determine the locality of the SHs in order to provide comprehensive information to BioINSouth HUBs coordinators on the regional bioeconomy status
- The rationale for engaging them to the BioINSouth Stakeholder Platform in relation to their interests in specific MAA actions or networking/information.

The SH mapping and analysis was carried out in multiple levels,

The Stakeholders Analysis was carried out through a multi-level methodology, where all partners contributed to the success of the mapping process.

- Level 1: PNO Innovation (Greece) as deliverable leader, applied a consolidated methodology where the initial step foresaw desk research exploiting Wheesbee, a sophisticated big data analytics tool – developed and owned by the INNEN partner (part of the PNO group) – specifically designed for analysing innovation ecosystems and extracting valuable information.
- Level 2: All MARG/HUB coordinating partners contributed to gathering information on relevant SHs from their respective regions
- Level 3: PNO Innovation (Greece) undertook the curation and harmonisation of all data obtained to provide them to the consortium in a uniform format (.xlsx), and compile them into easy-to-use databases that can be enriched by the HUB coordinators until the end of the project.

The BioINSouth databases were used to set up the BSP, to assist in the MAA along with the actions of T2.1, and to facilitate dissemination and communication of results to targeted environments. Given the dynamicity of the bioeconomy scene in South Europe, as well as a continuous evolution of priorities, policies, and regulations, beside the ongoing changing in the international scenario, this report will be updated with the replication regions (e.g. Türkiye) by the end of the project (M36) and assimilated in D7.4 "Final D&C&E Exploitation Plan" as support to the final BioINSouth strategy.

3 Objectives and approach

3.1 Objectives of stakeholder mapping in BioINSouth

It is well acknowledged that stakeholder engagement is one of the most important and challenging activity in promoting the benefits and concepts of bioeconomy, and several attempts have been made by the EU to provide comprehensive reports that outline the status of engagement strategies and propose measure to maximise interactions, with the most recent being the 2024 Report of DG RI "Enhancing Stakeholder Involvement in EU Bioeconomy Policy"[2]. DGRI identifies several challenges in bioeconomy stakeholder engagement such as:

1. **Underrepresentation of certain groups**

   Youth, NGOs, consumer and worker representatives, and the investment community are underrepresented in engagement initiatives, while there is a need to improve diversity in policy development.

2. **Definitional complexity and communication issues**

[2] Report of DG RI "Enhancing Stakeholder Involvement in EU Bioeconomy Policy" (2024) [URL]

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The concept of "bioeconomy" is often seen as vague or too technical, which hampers understanding and engagement, especially among citizens and SMEs., the latter being an integral part of bioeconomy in South Europe. Moreover, the information is fragmented so as for SHs to navigate efficiently among EU resources and understand their roles in bioeconomy.

3. **Limited impact feedback loops**

Although it is often that SHs contribute occasionally, they cannot see how their input contributes to results and how their feedback influences outcomes, hence reducing their willingness to engage.

4. **Lack of coordination across initiatives**

Stakeholder engagement efforts are also fragmented, and synergies between related EC initiatives (e.g., circular economy, sustainability) are underexploited.

5. **Resource and accessibility constraints**

Smaller sise stakeholders (e.g., regional groups, local actors, or those with less digital presence) may lack the capacity to participate meaningfully.

6. **Top-Down dominance and limited co-creation**

Many policies are perceived as being developed in a top-down fashion, with insufficient co-creation or direct dialogue with basic actors.

In BioINSouth, we aspire to use the data generated in the SH mapping and analysis, to actively support the HUB coordinators to address a wider audience of related stakeholders, and intensify efforts for outreach co-creation activities, in line with the MMA and the creation of MARGs.

SH mapping and analysis is shared with the consortium and especially the MARG/HUBs coordinators, while the main tool for the SH engagement will be the BSP where the SHs will be invited to register and access the BioINSouth knowledge database, connect with other stakeholders, and be invited to selected events. The main objectives are:

1) Describe actors and trends in bioeconomy within the BioINSouth countries and/or regions of South Europe, to gain insights into the most active players in the innovation landscape and key trends in the field.
2) Map the EU funded projects in relation to bioeconomy and disciplines relevant to South European dominant VCs in order to feed insights in the SH engagement strategy, for funding and networking opportunities, landscape of R&I related to bioeconomy, and determine key players from all EU that BioINSouth SHs can associate with
3) Identify SHs that can be interested in the replication of the BioINSouth concept and results and participate in co-creation activities
4) Identify policy makers as a separate important SH category (T7.3), to approach and initiate discussions on the regional dimension of BioINSouth and the importance of policy recommendations.

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3.2 Project mapping and stakeholder inventory

The first step in the SH mapping an analysis is to provide a rationale for compiling the inventory of stakeholders related to BioINSouth. With the MAA approach being centred around the model of the Quadruple Helix, the compilation is as follows:

1. Project mapping for the last 10 years (bioeconomy related)
2. Categorisation of BioINSouth SHs according to general categories of organisations (higher or secondary education, research organisation, public bodies, industry, other)
3. Subgrouping according to country and region
4. Subgrouping according to the QH model (academia, industry, government, civil society)

The steps followed are described in the following sections

3.2.1 Project mapping

In the evolving landscape of the EU bioeconomy, mapping EU-funded projects is not merely a cataloguing exercise: it is a strategic foundation for effective stakeholder analysis and engagement planning. Given the scale, diversity, and fragmentation of actors involved in bio-based transitions, understanding who is doing what, where, and with whom is essential for designing inclusive, evidence-based policies.

EU-funded projects—particularly under frameworks like Horizon 2020, Horizon Europe, LIFE, and Interreg, serve as active nodes of innovation, governance experimentation, and capacity building. Mapping these projects provides insight into **stakeholder landscapes in motion**, revealing formal and informal networks that traditional institutional mappings often miss. The important for an efficient project cataloguing and mapping, lies in the following points:

1. **Identifies Active Stakeholders Beyond Static Lists.** Stakeholder typologies based only on institutional roles risk excluding dynamic actors (e.g., SMEs, grassroots initiatives, regional clusters) that emerge through funded projects. Project mapping surfaces operational actors—those engaged in co-creation, demonstration, and deployment.
2. **Reveals Functional Relationships and Actor Constellations.** Projects often bring together quadruple helix configurations, showing not just who is involved, but how they interact (e.g., R&I partnerships, co-governance consortia, value chain integration). This enables mapping of collaborative intensity and sectoral cross-linkages.
3. **Uncovers Regional and Sectoral Engagement Gaps.** Geographic or value chain–oriented mapping (e.g., forestry, agri-food, marine bioeconomy) helps expose territorial blind spots or underrepresented sectors, supporting more balanced stakeholder inclusion.
4. **Captures Evolving Narratives and Interests.** EU projects are not neutral—they reflect and shape stakeholder agendas, policy priorities, and technical discourses. Project outputs (e.g., deliverables, position papers, pilots) provide a lens into stakeholder values, incentives, and modes of engagement.
5. **Supports Synergy Building and Avoids Duplication.** By mapping projects, policymakers can identify overlaps, complementarities, and opportunities for scaling or replication, enabling a more integrated stakeholder strategy across funding instruments and policy domains.

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EU-funded project mapping is a diagnostic and strategic tool. It transforms stakeholder analysis from a static inventory to a living ecosystem view, enabling more targeted, inclusive, and context-sensitive engagement approaches—crucial for the transformative ambitions of the EU bioeconomy.

3.2.2 Stakeholders' categories

Several frameworks have been established to categorise stakeholders and actors of various VCs, with the main target being inclusiveness and simplicity. Up to recently the triple helix model was sufficient to identify relations between industry and academia. The transition from the Triple Helix to the Quadruple Helix model was driven by the recognition that innovation ecosystems are not purely techno-economic—they are also socio-cultural and political.

The Quadruple Helix (QH) model is a framework that expands the traditional Triple Helix—which includes academia, industry, and government—by integrating a fourth dimension: civil society. This model acknowledges that sustainable and inclusive innovation, particularly within complex systems like the bioeconomy, requires participatory input from all societal sectors. It was developed in the early 1990s and established in the early 2000s by Carayannis and Campbell[3].

The dimensions of the QH model are the following:

- **Academia and R&I:** generators of scientific knowledge, supporters of technological development and tools → TRL 1-3
- **Industry and private sector:** commercialisation of innovation, investments, scaling up from lab to market → TRL 4-9
- **Governmental and public authorities:** shapers and enablers of policies and regulatory coherence
- **Civil society, end-users, NGOs and citizens:** bringing to the innovation pathways and products legitimacy, ethical considerations, societal acceptance, especially in relevant areas like bio-based products, land use, food systems, etc.

In the EU bioeconomy context, the QH model places significant emphasis on MAAs in projects like BioINSouth, by making innovation inclusive transparent and demand-driven, while it is particularly suited for fragmented SH ecosystems and strong territorial identities requiring bottom-up consultation and governance for the acceptance of change, such as South Europe.

[3] Carayannis, Elias G., and David FJ Campbell. "'Mode 3'and'Quadruple Helix': toward a 21st century fractal innovation ecosystem." *International journal of technology management* 46.3-4 (2009): 201-234.

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Figure 2 The QH model and subcategories of stakeholders

3.3 Methodology

The methodology we followed comprises of three main levels of information:

- Desk research
- Input from MARG/HUB Coordinators
- Input from Partners

All this information was collected and harmonised in order to provide the basis of the BioINSouth stakeholder mapping, the BioINSouth Global Database. (Figure 3) Identified SHs were categorised by country, resulting to the formation of 7 national SH databases, corresponding to BioINSouth countries. The national databases were further enriched by the MARG/HUB coordinators, and pivot tables were crafted in order to provide classification of national SHs per region (all regions), and specifically per BioINSouth regions.

The main challenge of the regional classification was to sort stakeholders accurately by region and achieve geographical precision. As presented in Annex III: Samples of the National/Regional Stakeholder databases, for the postal code mining (for organisation that initial data was missing) we used Google Places API search, while for the classification according to region, we applied specific functions in Excel, based on postal cost distributions provided by official sources (e.g. national postal services).

Below there is an overview of the methodology we applied.

Desk Research and Tool Deployment:

- **Wheesbee Tool**: Used to selectively identify stakeholders based on strategic criteria.
- **Keyword Definition**: PNO, in collaboration with partners, defines keywords for bioeconomy-related projects.
- **AI Tool Use**: The "Improve your query" function refines the keywords for more relevant results.

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- **Grant Scanning**: Scans pan-EU bioeconomy projects over the last 10 years, updated throughout the project's duration.
- **Database Creation**: The results are compiled into the BioINSouth Global Database in .xlsx format for partner use.

Partner Input Integration:

- **Enrichment of Data**: Partner inputs are incorporated to expand the database with regional-specific information.

Regional Program Integration:

- **Inclusion of Regional Data**: Relevant regional programs are added where available, ensuring the database reflects local bioeconomy activities.

Database Segmentation:

- **National Split:** The global database is split into 7 sub-databases for each BioINSouth region's country based on stakeholder location (postal codes).
- **Regional Split**: The national databases are enriched with the postal codes of regions (geographical or administrative) in order to apply filters according to BioINSouth specific regions

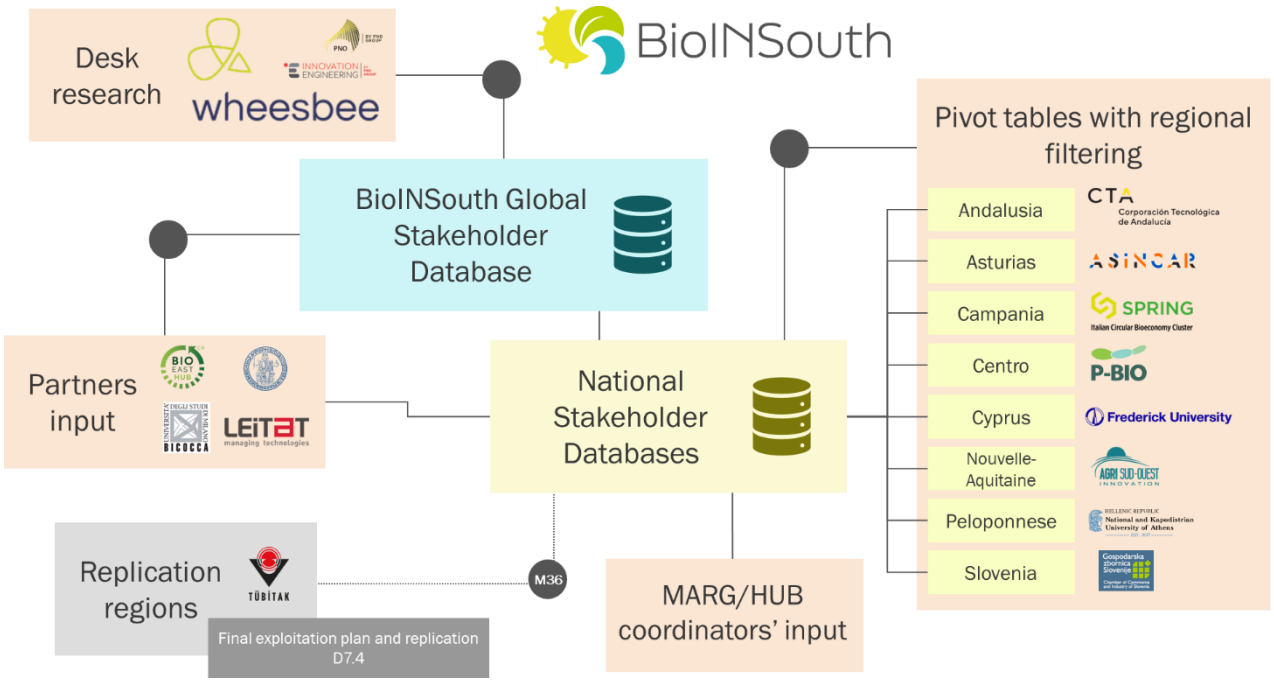

Figure 3 Overview of the stakeholder mapping in BioINSouth, and the subsequent creation of databases.

The fields of the Global BioINSouth DB, are shown in the following table. They were based on the participant lists created through the deployment of Wheesbee tool for grant/participant scan, describing the organisation as an entity as well as the projects participating, in the most detailed manner. Those fields were retained in the National databases, with the addition of three more fields:

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- Quadruple Helix classification
- Postal codes
- Region/district

Table 1 Information fields included in the BioINSouth Global DB, for the registration of organisations and their roles in funded projects

Field	Description
Organisation	Legal name of organisation
Coordinator	yes/no field
Contribution EUR	budget of organisation in a specific project
Country	Location of the organisation
Company Type	Higher or secondary education, research organisation, for-profit private organisation, public body, other
Address	Public contact data
Postal Code	
City	
Website	
Email	
Phone	
VAT	
Project Id	Participating project identifiers (cordis, ANR, etc)
Acronym	
Title	
Start Date	Duration of project
End Date	
Status	Active/closed
Authority	Funding authority
Funding country	Funding country
Description	Publishable summary of project
Cost EUR	Total project cost
Project funding EUR	Total EU/National contribution
Programmes	Framework
Contract Types	Type of Action (RIA, IA, CSA, etc)
Source	source of public data

3.3.1 Desk research

According to a solid structured and effective methodology developed by the PNO Group (of which PNO Innovation Greece is part) and already successfully applied in different European funded projects, stakeholders will be identified, mapped and analysed. PNO has conducted the Stakeholder Mapping employing Wheesbee (https://www.wheesbee.eu/), developed by INNEN. It is a technology intelligence and analytical tool able to support researchers, managers, and business users, driving and systematising the innovation process. Wheesbee integrates a broad variety of data concerning patents, scientific papers and R&D funded projects on any technological domain, and is specifically designed and adopted to access, with advanced search (semantic), to continually updated contents. Moreover,

this advanced tool facilitates a thorough exploration of stakeholder dynamics, offering a comprehensive understanding of the innovation landscape. Wheesbee allows to rapidly explore and analyse:

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- **Projects:** Worldwide funded research projects to extract the detailed list of all the involved entities, as well as related public project results. Notably, the tool allows to search R&D projects funded by public bodies at European level (European Commission) starting from 2002 (corresponding to more than 1 million funded projects), at national level (Netherlands, UK, Germany, France, Finland, Norway, Portugal, Switzerland) and international level.
- **Patents:** Over more than 420 million patent documents worldwide (from a variety of international patents databases including Europe, US, WIPO, Japan and China), containing information about inventions and technical developments from 1985 to today.
- **Market reports, websites and press releases:** URLs crawled and indexed starting from user inputs, as well as all URLs indexed by the system; commercial information on private and public companies that include investments and financing information, founding members and leaders, acquisitions, news and industry trends.

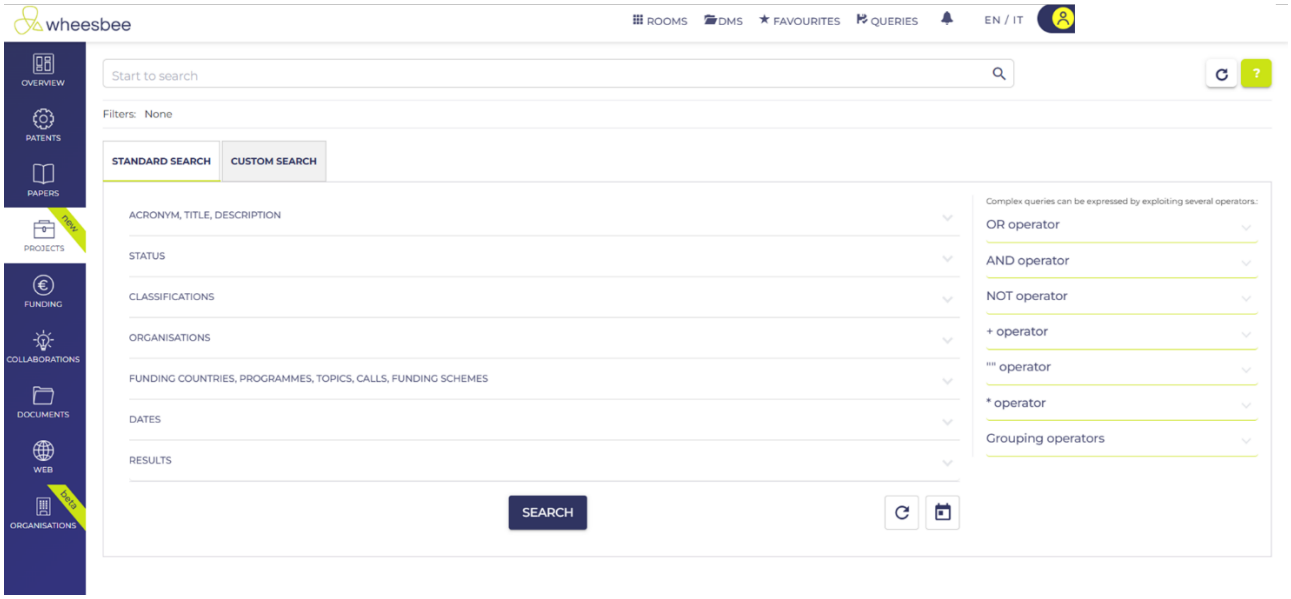

Figure 4 Main search page of the Wheesbee interface, showing the possibilities for project search, including the newly introduced section of "results".

PNO deployed the Wheesbee proprietary tool to selectively identify SHs according to the selected criteria discussed in the previous sections. The strategic use of Wheesbee will enable PNO to develop a comprehensive and meaningful stakeholder analysis tailored to the specific regional needs of the BioINSouth project. This is achieved by performing the following consecutive steps:

1) Definition of keywords by PNO in collaboration with the partners that provide a general overview of bioeconomy.
2) Refinement of keywords with the AI tool "Improve your query" that is included in the Wheesbee to get the most relevant information.
3) Grant scanning for bioeconomy related projects in a pan-EU level for the last 10 years, updated throughout the duration of T2.3.
4) Analysis of the results of the Wheesbee grant scanning to draw insights

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5) Compilation of the BioINSouth Global DB including all the projects and participants in .xlsx format, to be used by the partners for EU stakeholder identification

The keywords selected by the consortium and the refinement performed by Wheesbee, are presented in Annex I: Definition of keywords and Wheesbee refinement.

The BioINSouth Global Stakeholder DB was built upon this initial search, and the analysis of data are presented in Section 4.1.

The scope of the desk research was to:

1. Provide an overview of the key stakeholders and actors in bioeconomy within the last 10 years within the EU, highlighting the most active participants and the innovation landscape and identify the trends within the sector, during the last 10 years. This objective is crucial for feeding to WP4 and WP7 for mapping the VCs and generate maximum visibility of the project, through high quality content.
2. Enrich the list of EU R&I projects with similar topics with BioINSouth, both in terms of prevalent VCs in South Europe, and in terms of connecting regions across EU. This action significantly enhanced the inclusivity and SH engagement beyond the partners; network.
3. Identify SHs that will be potentially:
    a. Interested to be further engaged in BioINSouth due to locality (creation of national/regional SH databases, see Section 4)
    b. Interested to participate actively in the BioINSouth Stakeholder Platform and provide insights and meaningful interactions (see Section 5)
    c. Form the basis along with the MARG members of an extended network of South European bioeconomy stakeholders, to serve as a critical mass for policy development.

The grant scan and the resulting BioINSouth Global Stakeholder DB, includes Funded EU R&I projects, as well as national research projects from countries with official registries, and feedback from partners, starting from June 2014 to February 2025. A group of relevant keywords for the search have been selected to ensure the proper focus of the research and the inclusion of all projects relevant to the ultimate objectives of the analysis. This 10-year analysis provides important insights on the gradual inclusion of bioeconomy in funded schemes and topics, as well as the trend of funding amounts throughout the last 10 years. The methods and conditions for the deployment of Wheesbee, are described in Annex I: Definition of keywords and Wheesbee refinement.

3.3.2 Input from BioINSouth MARG/HUB coordinators

A level of information on the SH mapping involves the input provided by the MARG/HUB coordinators (Andalusia – CTA, Asturias – ASINCAR, Campania – SPRING, Centro – P-BIO, Cyprus – FredU, Nouvelle-Aquitaine – ASOI, Peloponnese – NKUA, Slovenia – ACIS) which is of uttermost importance concerning the regional aspects of BioINSouth, and the creation of the regional SH databases for the eight BioINSouth regions.

CTA stands as a pivotal innovation cluster in Southern Europe, fostering robust international collaborations across academia, industry, and public authorities. Established in 2005, CTA has been

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instrumental in advancing R&D initiatives, supporting over 690 projects with a cumulative budget exceeding €509 million, and engaging more than 1,000 public researchers in partnership with companies. CTA's international impact is underscored by its active participation in EU funded projects, and initiatives, while these extensive networks and strategic partnerships, CTA not only amplifies Andalusia's presence in the global innovation landscape but also contributes significantly to the advancement of the bioeconomy and sustainable development goals at the international level.

ASINCAR, the Meat Industry Association of Asturias, has evolved into a dynamic agri-food cluster and technological center, significantly influencing the international bioeconomy landscape. With a membership comprising approximately 100 industrial entities—over 95% of which are SMEs—ASINCAR actively engages in European initiatives to foster innovation and sustainability in the agri-food sector. Internationally, ASINCAR plays a pivotal role in the BioINSouth project, collaborating with partners across Southern Europe to enhance bio-based sectors through environmental sustainability assessments. Its participation in the Vanguard Initiative's Bioeconomy Pilot underscores its commitment to smart specialisation and cross-regional collaboration. ASINCAR's contributions extend to strategic partnerships like EU4FOOD and AdPack, and its membership in the Food for Life technological platform highlights its dedication to advancing food innovation.

SPRING, the Italian Circular Bioeconomy Cluster, has established itself as a central actor in advancing the bioeconomy both nationally and internationally. Founded in 2014, SPRING brings together over 130 members, including public and private research centers, SMEs, large companies, trade associations, regional clusters, consulting firms, and financial institutions. Its mission is to foster systemic growth based on the bioeconomy, promoting sustainable innovation and territorial development. Internationally, SPRING has forged numerous collaborations to enhance the global bioeconomy landscape. It has signed Memorandums of Understanding with various European and international clusters and entities, aiming to strengthen collaboration and synergies in sectors related to the circular bioeconomy, particularly focusing on biobased products and new industrial biotechnologies. SPRING is also a founding member of the European Bioeconomy Clusters' Alliance, a network launched in February 2025 that unites 14 clusters from 11 EU Member States. This alliance seeks to boost the growth of a circular and sustainable bioeconomy across Europe, positioning the EU as a leader in this sector.

P-BIO, the Portuguese Bioindustry Association, serves as a cornerstone in Portugal's biotechnology and life sciences sector, fostering a conducive environment for the creation and growth of biotech startups and promoting their development both nationally and internationally. Since its inception in 1999, P-BIO has been instrumental in unifying and affirming the sector within Portugal, encompassing areas such as biopharmaceuticals, digital health, precision medicine, new therapies and diagnostics, synthetic biology, industrial biotechnology, agro-food biotechnology, and marine biotechnology. Internationally, P-BIO actively represents Portuguese biotechnology interests through its membership in EuropaBio and the International Council of Biotechnology Associations (ICBA), facilitating connections between Portuguese companies and global partners in government, investment, regulatory agencies, and other industry-related institutions.

FredU has emerged as a strategic player in the international sustainability and bioeconomy landscape through the active engagement of its Nature Conservation Unit (NCU) and Sustainable Energy Research Group (SERG). Both units demonstrate a strong commitment to transnational collaboration, contributing

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to major European initiatives and acting as catalysts for knowledge transfer and policy influence. The NCU is widely recognised for its participation in high-impact EU-funded environmental projects and its close partnerships with key stakeholders across Europe in the fields of biodiversity protection, ecosystem services, and conservation policy. SERG, meanwhile, is actively engaged in pan-European research networks that address the twin transitions of decarbonisation and digitalisation in the energy sector. Through its leadership and participation in EU projects SERG maintains robust connections with academic, industry, and policymaking communities across Europe, positioning the university as a thought leader in sustainable energy and building performance. By leveraging these international networks, Frederick University extends its influence beyond academia, co-shaping sustainable development agendas and supporting evidence-based policymaking at European and regional levels.

NKUA through its Research Centre Bio3 plays a pivotal role in advancing Greece's bioeconomy landscape. With a robust academic foundation and extensive international experience, The group has been instrumental in integrating scientific research with practical applications in biotechnology and sustainable development. The establishment of the Research Institute for Biotechnology-Circular Bioeconomy-Sustainable Development underscores NKUA's commitment to fostering innovation and addressing regional challenges in Southern Europe. The university's active participation in events such as the "Promoting Bioeconomy in Greece" workshop further highlights its role in bridging knowledge gaps and fostering dialogue among key actors in the bioeconomy sector. Additionally, NKUA's organisation of the International Summer School on Circular Bioeconomy and Sustainable Development provides a platform for students and early-career scientists to engage with current trends and perspectives in the field. This initiative not only enhances stakeholder engagement but also contributes to the development of a dynamic ecosystem conducive to innovation and sustainable development.

The **Chamber of Commerce and Industry of Slovenia** (CCIS) stands as a central pillar in advancing Slovenia's bioeconomy, particularly through its Association of Chemical Industries of Slovenia (ACIS). ACIS prioritises the bio-based economy, aligning it with circular economy principles and industrial symbiosis, recognising the chemical sector as a key driver in this transition. CCIS actively engages in several EU-funded initiatives to bolster stakeholder collaboration and regional bioeconomy development. Furthermore, CCIS plays a pivotal role in the Slovenian Bioeconomy Hub, a dynamic multistakeholder platform, that connects various stakeholders, including businesses, research centers, educational institutions, and public administrations, to accelerate the circular bioeconomy. It offers access to knowledge, international best practices, and supports innovative circular bio-based projects, fostering youth engagement through programs like Summer Schools and Hackathons

ASOI is a prominent French competitiveness cluster ("pôle de compétitivité") dedicated to fostering innovation in the agri-food sector across southwestern France, particularly in the Nouvelle-Aquitaine and Occitanie regions. With a membership exceeding 400 entities, including SMEs, mid-cap companies, research centers, and institutions, ASOI serves as a nexus for collaboration between scientific and economic actors, aiming to integrate innovative technologies within the territory to gain a competitive advantage. ASOI's strategic partnerships extend to collaborations with organisations like Valorial and INRAE, aiming to mobilise resources in favor of innovation and support stakeholders in the agricultural and agri-food sectors across various French regions. Additionally, ASOI's collaboration with international companies, such as Kubota Innovation Center Europe, exemplifies its role in facilitating open innovation strategies and accelerating the development of future agricultural machinery.

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3.3.3 Input from the rest of BioINSouth consortium

Apart from the MARG/HUB coordinating partners, complementary input is provided by the **research performing partners UNINA, UNIMIB – Italy, and LEITAT-Spain.**

LEITAT Technological Center, based in Terrassa, Spain, is a prominent research and innovation entity with over a century of experience in applied R&D across various sectors, including biotechnology, circular economy, and sustainable production. The center actively engages in numerous EU-funded projects, such as C4B, and Waste4Soil, which focus on advancing bio-based value chains, environmental sustainability, and stakeholder collaboration. Through these initiatives, LEITAT facilitates multi-stakeholder engagement, connecting academia, industry, and policy actors to promote innovation and the adoption of sustainable practices in the bioeconomy sector.

UNIMIB plays a crucial role in Italy's bioeconomy development, with a strong emphasis on fostering collaboration between academia, industry, and policymakers. The university is actively involved in numerous EU projects focused on sustainable practices and circular bioeconomy, facilitating stakeholder engagement across sectors. UNIMIB also supports the advancement of bioeconomy through its specialised education programs, such as the Bioeconomy in the Circular Economy (BIOCIRCE) Master's program, aimed at training professionals equipped with the skills to drive innovation and sustainability in the bioeconomy. These initiatives position UNIMIB as a key hub for knowledge transfer and stakeholder integration in the bioeconomy sector.

UNINA is a cornerstone of Italy's bioeconomy ecosystem, particularly in the Southern regions. UNINA contributes to the OECD Regional Peer Dialogue on Circular Bioeconomy, showcasing its role in supporting circular agriculture and bio-based production through initiatives like the Terra Next Accelerator and the Agritech Centre at the San Giovanni a Teduccio campus. Additionally, UNINA offers specialised education programs, such as the Master's in Industrial Chemistry for Circular and Bio Economy, equipping students with the expertise to drive sustainable practices in the bioeconomy sector.

Special contribution in the SH mapping will be added by partners BIOEAST HUB CR and TUBITAK, as mature partner in the bioeconomy regional development, and potential replication region, respectively, in the stage of exploitation.

BIOEAST HUB CR serves as a central facilitator for bioeconomy development in Central and Eastern Europe, particularly in the Czech Republic. Established with support from the BIOEAST Initiative and the Ministry of Agriculture of the Czech Republic, it is the first national BIOEAST HUB in the region. BIOEAST HUB CR actively engages a diverse range of stakeholders, including research organisations, universities, businesses, and non-governmental organisations, fostering collaboration to advance sustainable bioeconomy practices. It coordinates thematic working groups on areas such as freshwater-based bioeconomy and bioeconomy education, aligning with the European Green Deal and the European Bioeconomy Strategy.

The Circular Economy and Resource Efficiency Research Group at **TÜBİTAK** Marmara Research Center (**MAM**) is a pivotal entity in Turkey's transition towards a sustainable, circular economy. Operating within the Vice Presidency of Climate and Life Sciences, this group develops strategies aimed at reducing raw material consumption and mitigating environmental impact across various sectors. The group actively engages in national and international collaborations to promote resource efficiency and circular economy

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practices. For instance, TÜBİTAK MAM co-hosted a high-level workshop with COMSATS, focusing on zero-waste initiatives and the transformation of waste streams into valuable resources. Discussions encompassed innovative approaches such as plant-based protein extraction from agricultural waste, pyrolysis for clean energy production, and advanced materials for methane recovery from biogas. Through these initiatives, TÜBİTAK MAM's research group contributes significantly to the advancement of circular economy principles, fostering sustainable development and resource efficiency in Turkey and beyond.

3.3.4 Harmonisation of results

Effective stakeholder mapping and database creation are fundamental to the success of initiatives like BioINSouth, ensuring that all key actors are identified and engaged according to their specific regional context. However, the real value comes from harmonising the data collected across multiple stages of the process. Harmonisation ensures that stakeholders are accurately categorised, information remains consistent, and engagement strategies can be tailored to meet both EU-wide and region-specific needs. PNO is responsible for the harmonisation of results for the stakeholder mapping and the creation of databases as described in the previous sections. The importance of having harmonised final data sets lies in the:

- **Consistency Across Levels**: Harmonising the database results ensures it reflects both the pan-EU landscape and the specific needs of individual regions.
- **Accurate Targeting**: Harmonised data allows for precise, regionally targeted stakeholder engagement, which is crucial for effective collaboration and project alignment.
- **Informed Decision-Making**: A harmonised approach enables partners to make data-driven decisions, leading to stronger, more efficient collaborations based on a consistent set of stakeholder insights.
- **Support for Long-Term Goals**: The harmonised database provides a robust foundation for future activities by ensuring that comprehensive, region-specific stakeholder data is readily accessible and actionable.

In addition, several practical aspects were taken into account:

- Consistent availability of all necessary information
- Elimination of redundancies and multiple registrations
- Proper compilation of BioINSouth Regional Databases:
    - determination of locality through official regional postal codes
    - determination of SH groups based on the QH model
- Comprehensive mapping that encompasses all relevant elements
- Solid and accurate GDPR compliancy of all data collect (public data only to be used for generic contact)

This curation is vital for driving the strategic aims of BioINSouth, facilitating seamless coordination between stakeholders, and ensuring the sustainability and effectiveness of the bioeconomy initiatives within the project.

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All activities for the harmonisation were performed exclusively by PNO, in Microsoft Excel environment with the contribution of Copilot and ChatGpt to generate respective pivot tables. Specific outputs available to the consortium are shown in the following table.

Table 2 Project and stakeholder database outputs of BioINSouth

Specific output	Content	Format
BioINSouth Global Stakeholder Database	Bioeconomy project scanning 2014-2024	.xlxs
Linked and Sister Projects Database	Closely related bioeconomy projects, including CBE JU	.xlxs
Spain Stakeholder Database	Spanish stakeholder database with regional sub-classification	.xlxs
Italy Stakeholder Database	Italian stakeholder database with regional sub-classification	.xlxs
Portugal Stakeholder Database	Portuguese stakeholder database with regional sub-classification	.xlxs
Cyprus Stakeholder Database	Cypriot stakeholder database	.xlxs
France Stakeholder Database	French stakeholder database with regional sub-classification	.xlxs
Greece Stakeholder Database	Greek stakeholder database with regional sub-classification	.xlxs
Slovenia Stakeholder Database	Slovenian stakeholder database	.xlxs

The above Excel files contain all the public data available for each stakeholder (including website, country, description, and public email contact if available). They also allow for quick filtering of stakeholders according to their QH classification, expertise, specific participation in projects pointing to engagement reasons, and several fields, and of course regions. Due to this functional and efficient setup, the databases will serve as key operational tools for all MAA activities implemented in the project and scanning of potential replication regions. Additionally, regional outputs for Türkiye and the Marmara district as a replication region, will be explored through D7.4 and D7.5, concerning the replication and exploitation of the BioINSouth methodology. Sample pages of all databases can be found in Annexes 7.2 and 7.3

All the databases generated through the stakeholder mapping and analysis, will be available to the BioINSouth consortium as Microsoft Excel files, that can be updated and enriched from the relevant partners with their own input, throughout the duration of the project. Basic functionalities and potential of the databases (how to update, how to search, how to categorise, how to add fields, pivot tables, etc) will be presented and elaborated through the 1st exploitation co-creation workshop organised by PNO.

4 BioINSouth databases and analysis

4.1 Global BioINSouth Stakeholder Database

In the first and pivotal stage of the stakeholder mapping, a grant scan was performed in order to determine in a pan-EU level the status of funding in bioeconomy and BioINISouth-related VCs, in the last 10 years (June 2014-February 2025). In the database were incorporated also the nationally funded projects of Spain, Portugal and Italy, where national inventories exist.

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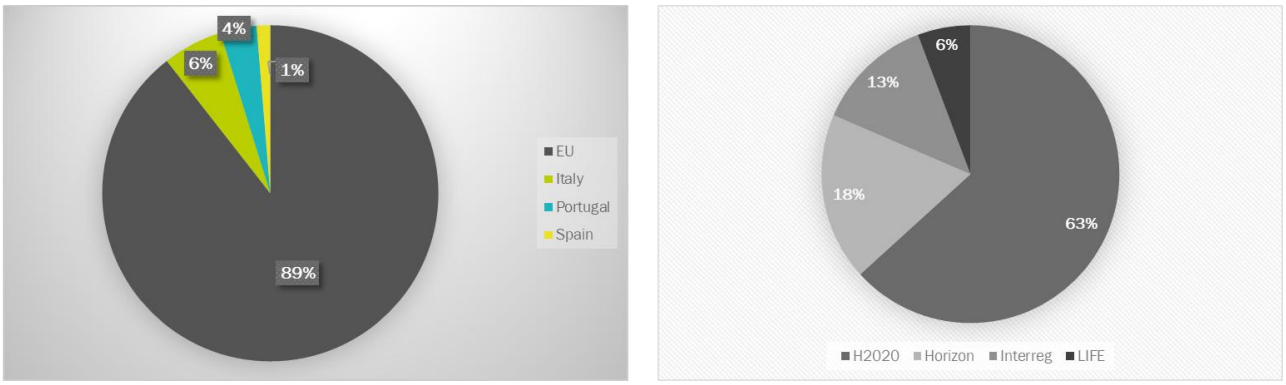

A. Projects by funding country 2014-2015

B. EU funded projects by work programme

Figure 5 Bioeconomy related projects for the period June 2014 – February 2025, for EU, Spain, Portugal and Italy as funding countries. EU is considered as a single funding country

A total of 12,745 projects were identified as generally relevant to the BioINSouth VCs, territories and objectives, with a start date after 1/6/2014. Among them, 11,399 were funded from the EU under the HORIZON 2020, Horizon, Interreg and LIFE Work Programmes, while 2,828 of them are currently active. It is observed that since 2015 there is a decline in EU funding for bioeconomy related projects, that coincides with the general EU funding trend and the drop in resources.

Figure 6 EU project trends according to number (left) and EU funding for the years 2015-2024.

It is interesting to note that during the COVID-19 pandemic period (2020-2021) the amount of funding for bioeconomy projects was kept relatively stable, nevertheless the number of projects rapidly declined. This period coincided with the transition from Horizon 2020 programme to Horizon Europe and potentially showed the insufficient coverage of bioeconomy research from applicants, while the EU funding for the bioeconomy discipline was kept intact between the two work programmes.

In addition, we observe **a drop in the project trend in 2018**, which was the year that the EU published the updated Bioeconomy Strategy, outlining new objectives and actions to be launched from 2019, and preparing the ground for the new work programme Horizon Europe. The interim period may have resulted

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in a temporary slowdown in project approvals and funding allocations as the new strategy's implementation was being prepared. Moreover 2018–2020 Horizon 2020 Work Programme, the EU concentrated funding on fewer topics with larger budgets, aligning with political priorities such as climate resilience, clean energy, and digitisation. While the circular economy received significant attention with dedicated calls and topics, the bioeconomy was integrated into broader themes, potentially leading to a perceived reduction in dedicated bioeconomy funding.

The Global BioINSouth Stakeholder Database has a high importance in view of the transition of **bioeconomy responsibilities from DG Research & Innovation (DG RTD)** to **DG Environment (DG ENV)**. Although the date for the formal transfer has not been announced, DG ENV has launched in March 2025 a public consultation for the forthcoming EU Bioeconomy Strategy, scheduled for adoption by late 2025.[4]

This shift mirrors a broader strategic realignment emphasising to the assimilation of environmental initiatives dealing with environmental objectives, to sustainability and environmental impact criteria. Bioeconomy is more likely to be shifted more towards circularity, with the risk of reducing the innovation potential and funding especially in bio-based chemicals, materials, and advanced biorefineries, etc, unless tied to solid positive environmental outcomes.

As a result, a **change in the landscape of stakeholders**, and especially the **important** subcategory of **actors** is foreseen, while industrial SH may need to position themselves close to environmental goals, while the role of civil society is enhanced. This is an aspect that makes the large BioINSouth Global Stakeholder Database a useful tool, to monitor the foundational changes to stem from this transition.

The analysis of top players in the above project, it was found that for both closed and active projects, the dominant stakeholder is **Fraunhoffer** (Germany) in the first position, with a total of 571 projects, followed by **CSIC** (Consejo Superior de Investigaciones Científicas – Spain) with 543 projects, and **CNR** (Consiglio Nazionale delle Ricerche – Italy) with 518 projects. In addition, **CERTH** (Centre for Research & Technology Hellas – Greece) has a stable presence in the top 10 with 327 projects, while France with **INRAE** enters the top 10 with 91 projects currently active.

[4] Public consultation for the forthcoming EU Bioeconomy strategy [URL]

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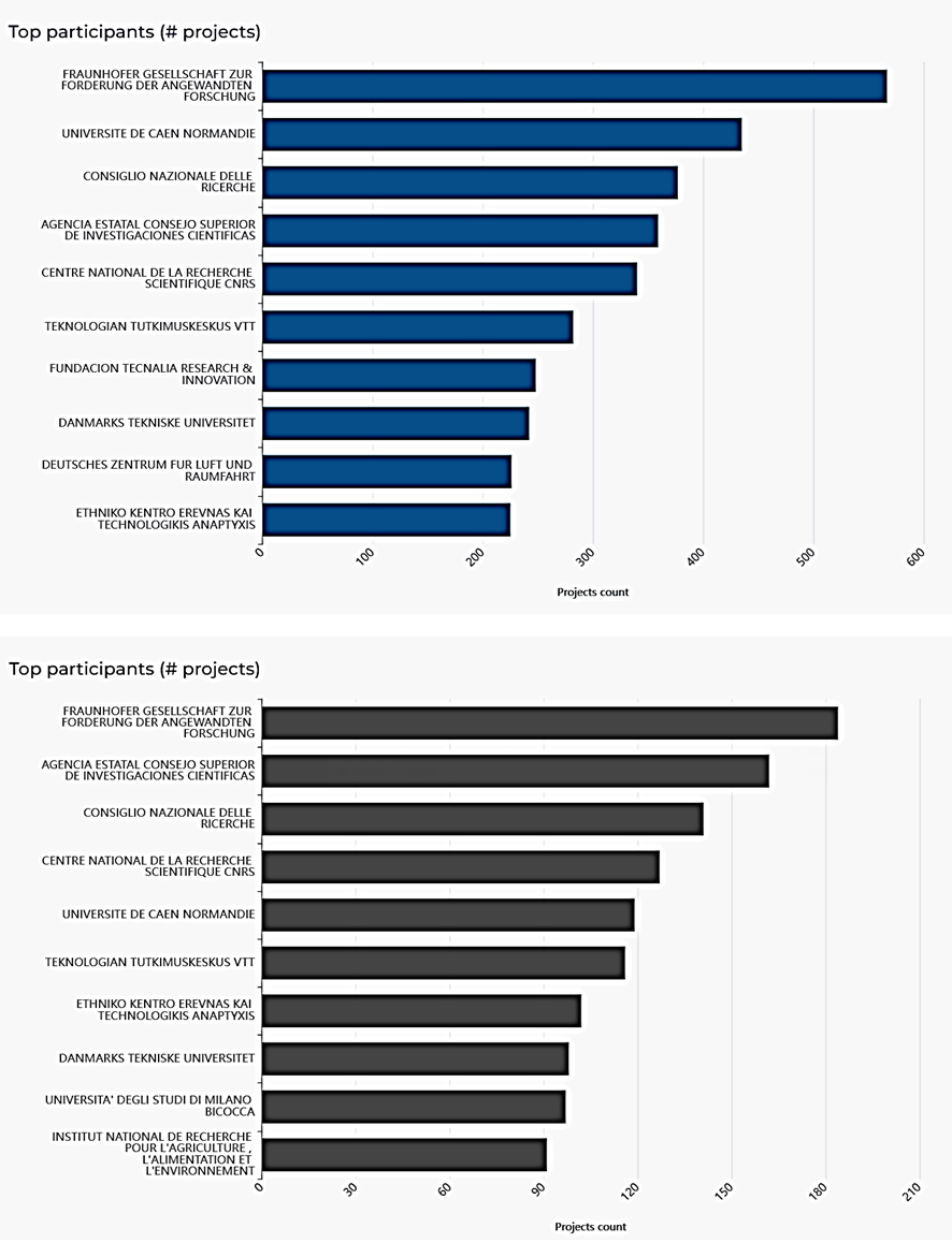

Figure 7 Top players in bioeconomy related EU funded projects per number of projects 2015-2024. Up: closed projects (total: 8,568). Down: active projects (total: 2,828).

As far as the scientific disciplines are concerned, and focusing only in the 2,828 active EU projects, as anticipated the top scientific discipline is **natural sciences** (>1800 projects). It is important to mention that disciplines related to economics and business, social sciences, civil priorities, business and management, sociology, business models, political sciences, political policies, civil society, public health, have a medium presence in ongoing projects, while **gender studies are extremely underrepresented** in bioeconomy with **only 10 related projects** out of 2,828 ongoing projects.

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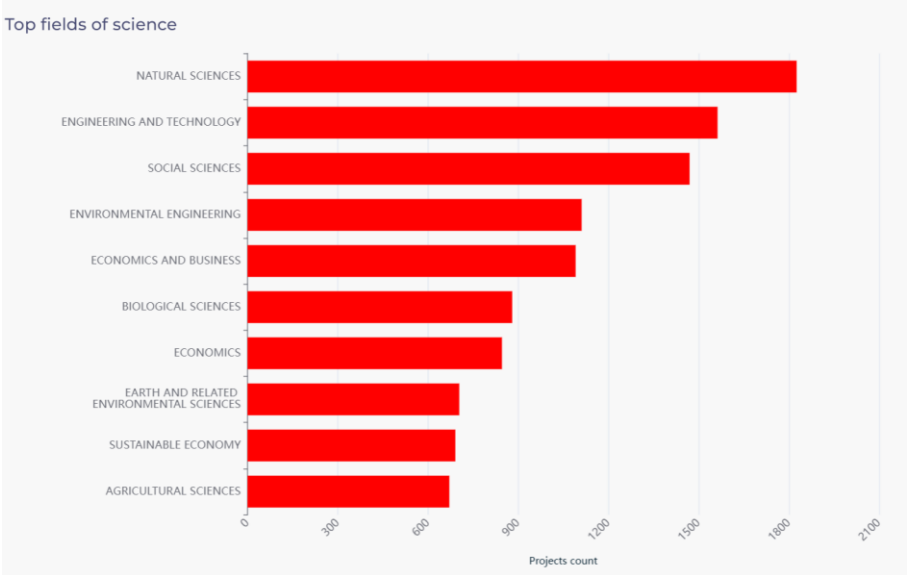

Figure 8 Top fields of science in bioeconomy related EU projects active in 2025

Concerning the type of coordinating organisations for EU-funded bioeconomy projects, it is interesting to see the trend forming in the currently active projects, and the closed ones. Higher/secondary education organisations, and research organisations dominate as coordinating entities (private or public) in both active and closed projects, with more than 55% in both categories.

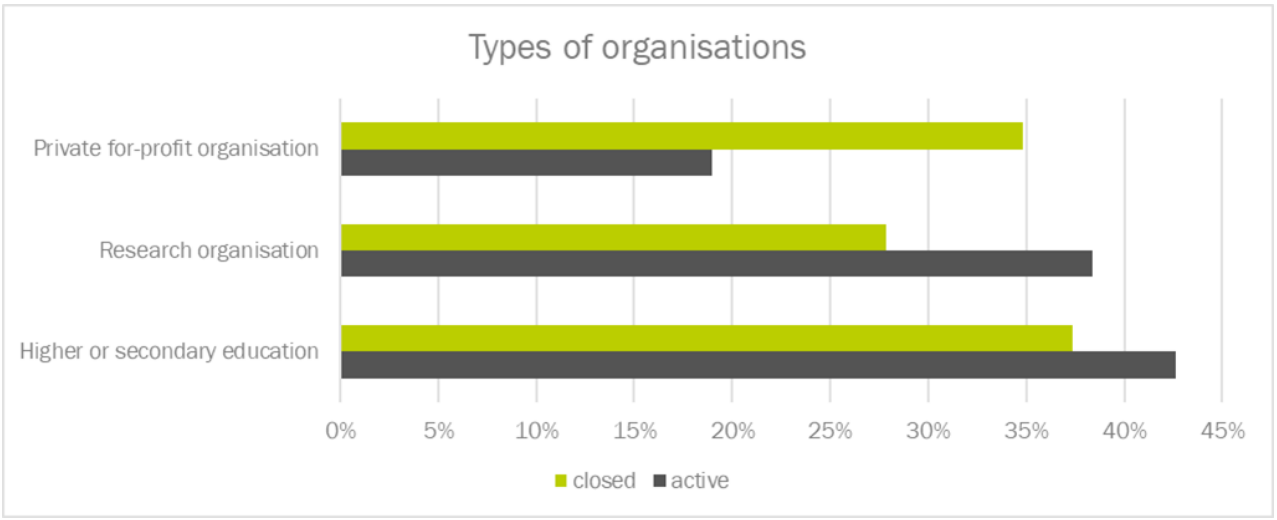

Figure 9 The types of organisations that coordinate EU-funded bioeconomy related projects, compared by status of the project (active and closed).

Specifically for the active projects, the role of research organisations is enhanced with an increase of about 10%, while coordination by universities slightly subsides. More interestingly, the role of private for-profit entities as coordinators seems to be significantly reduced in active projects compared to closed projects, pointing to a reduced interest by the private domain to undertake increased responsibility of research activities.

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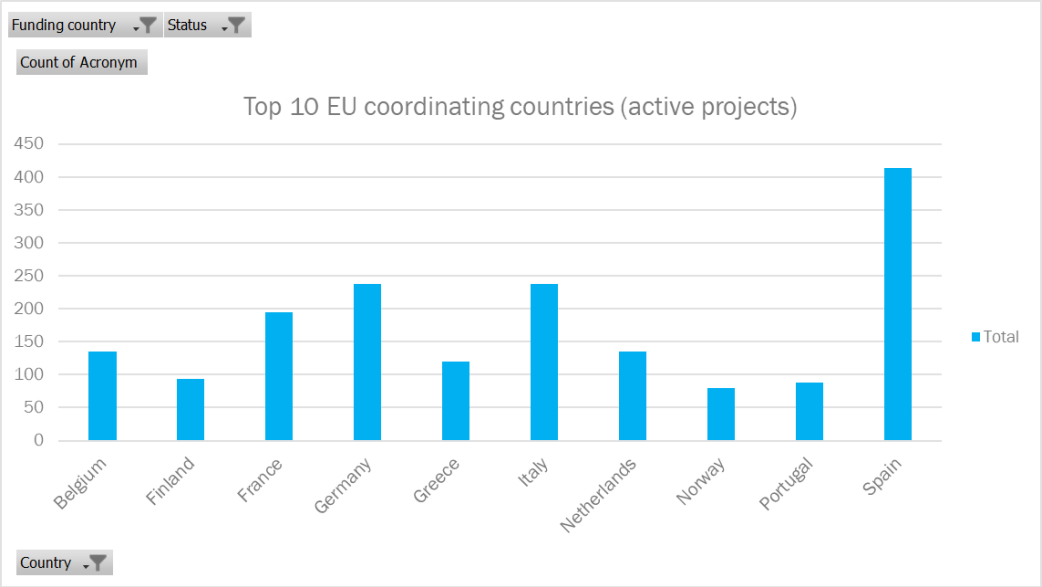

Figure 10 Top 10 coordinating countries of active EU bioeconomy related projects

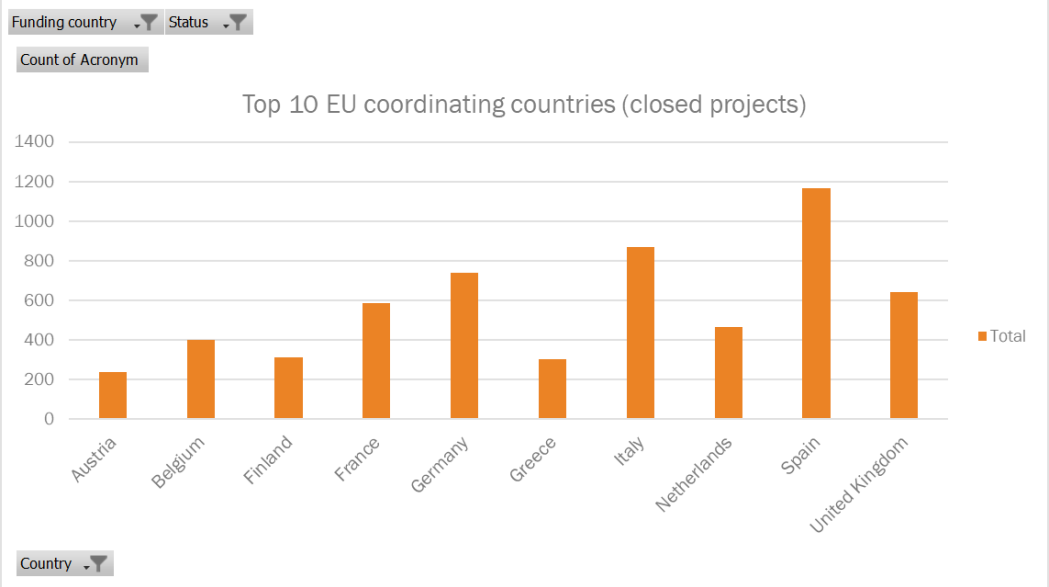

Figure 11 Top 10 coordinating countries of closed EU bioeconomy related projects

In terms of coordinating countries, it is important to note that from the more than 2000 active projects, 1733 are coordinated by 10 countries, as shown in Figure 10. In the first position is Spain with 413 projects, followed by Italy and Germany with 273 projects, and France in the 3rd position with 194 projects.

Greece has a stable presence, mainly in the energy sector through bioeconomy, while Portugal emerges as a new player, along with the increased activity of neighbouring Spain that holds a top position. When compared with the situation in the previous years, Spain has significantly enhanced its position in the European bioeconomy landscape during the last years, as portrayed by the data of Figures Figure 10 and Figure 11.

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4.2 Linked and sister projects databases

In addition to the Global DB, a Linked and Sister projects sub-database was created (see Section 7.4), that will be updated throughout the duration of the project and will be employed in relation to WP7 for creating synergies, through clustering activities. BioINSouth consortium has already employed this list to establish contacts and synergies with most of these projects, and a summary of these activities in relation to the database is presented in the following table. Across a diverse portfolio of EU-funded bioeconomy projects, a strong network of **collaborative synergies** has emerged, fostering knowledge exchange, methodological alignment, and regional engagement. These synergies are instrumental in advancing the circular and sustainable bio-based economy across Europe.

- **Communication and dissemination as a foundation for synergies**

Nearly all projects, regardless of their contract type, emphasize **communication and dissemination exchange**. This foundational synergy ensures that insights, tools, and outcomes are shared widely, promoting transparency and cross-project learning.

- **WP synergies**

Several projects, particularly those under **RIA** and **IA** contracts, have established **WP4 synergies**, focusing on environmental assessment tools like **life cycle assessment (LCA)**. These include:

  - Sharing LCA data and methodologies
  - Conducting joint questionnaires to identify relevant sustainability indicators
  - Organizing learning sessions to enhance tool usability

This alignment not only improves methodological consistency but also enhances the robustness of sustainability assessments across projects.

- **Regional and event-based collaboration**

Projects under the **CSA** contract type have cultivated **regional synergies**, particularly through:

  - **Mutual invitations to regional events** (notably in Greece)
  - **Participation in marketplaces and conferences** (e.g., the Bioeconomy Marketplace in Bologna, ERSA congress)
  - **Oral presentations and policy brief exchanges**, which help translate project findings into actionable regional strategies

These interactions strengthen the territorial dimension of the bioeconomy, ensuring that local contexts and stakeholders are actively engaged.

- **Methodological innovation and exchange**

Projects like **ESCIB** and **LCA4BIO** are pioneering **novel assessment methodologies**, which are being shared across the network. This includes:

  - Biodiversity analysis
  - Circularity assessments
  - Harmonization of LCA methods

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Such innovation ensures that the bioeconomy transition is not only sustainable but also scientifically grounded and forward-looking.

- **Strategic clustering and support services**

Some CSA projects, such as **ToBeReaL**, offer **technical, business, regulatory, and social assistance services** to other initiatives, particularly in **lagging regions**. Others engage in **clustering activities**, creating thematic alliances that amplify impact and visibility.

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Table 3 Summary of synergies with Linked-Sister projects, as appeared in the Linked-Sister projects Database

Project Id	Acronym	Title	Contract type	Synergies established
CORDIS-249437	BIORADAR	Monitoring system of the environmental and social sustainability and circularity of industrial bio-based systems		Communication/dissemination exchange, WP4 synergies
CORDIS-257694	BIO2REG	Enabling transition towards circular and systemic BIOeconomy model regions by a Regions-to-Regions approach	CSA	Communication/dissemination exchange, WP2 synergies and mutual participation in regional events (Greece), oral presentation of BioINSouth to BIO2REG-relevant international conferences (64th ERSA congress on regional policies), policy briefs exchange
CORDIS-239008	BIOMODEL4REGIONS	BIOMODEL4REGIONS - Supporting the establishment of the innovative governance models to achieve better-informed decision-making processes, social engagement and innovation in the bio-based economy	CSA	Communication/dissemination exchange, participation in the Bioeconomy Marketplace (2024, Bologna), clustering
CORDIS-241864	BIORECER	Biological Resources Certifications Schemes	IA	Communication/dissemination exchange, WP4 synergies (brief questionnaire for the identification of relevant information linked to WP4)
CORDIS-242560	BIOTRANSFORM	Circular BIOeconomy TRANSFORMation for regions by enabling resource and governance networks	RIA	Communication/dissemination exchange, WP4 synergies (brief questionnaire for the identification of relevant information linked to WP4), learning session for the LCA tool
CORDIS-258186	C4B	Circular Bio-Based Business models to create high-value Bio-based products in integrated value chains	RIA	Communication/dissemination exchange, WP4 synergies, information exchange on LCA approaches and stakeholder engagement
CORDIS-239009	CALIMERO	Industry CAse studies anaLysis to IMprove EnviROnmental performance and sustainability of bio-based industrial processes	RIA	Communication/dissemination exchange, WP4 synergies (replication data sharing), information exchange on LCA approaches, biodiversity analysis, circularity assessment
CORDIS-258176	ESCIB	Developing environmental sustainability & circularity assessment methodologies for industrial bio-based systems	RIA	Communication/dissemination exchange, information exchange on novel assessment methodologies
CORDIS-258503	LCA4BIO	Harmonised L ife C ycle A ssessment methods for sustainable and circular BIO based systems	RIA	Communication/dissemination exchange, information exchange on novel assessment methodologies
CORDIS-241203	ROBIN	Deploying circular BIOecoNomies at Regional level with a territorial approach	CSA	Communication/dissemination exchange, synergies on WP2, mutual invitation to regional events (Greece), MARG KOM information exchange
CORDIS-239019	RuralBioUp	Empowering EU Rural Regions to scale-Up and adopt small-scale Bio-based solutions: the transition towards a sustainable, regenerative, inclusive and just circular bioeconomy	CSA	Communication/dissemination exchange, synergies on WP2, mutual invitation to events
CORDIS-241847	SUSTRACK	Supporting the identification of policy priorities and recommendations for designing a sustainable track towards circular bio-based systems	CSA	Communication/dissemination exchange, synergies on WP4 (potential incorporation of results in BioINSouth toolikit, October 2025)
CORDIS-266747	ToBeReaL	Empowering bioeconomy projects by deploying Technical, Business, Regulatory and Social assistance services	CSA	Communication/dissemination exchange, mutual invitation to events, lagging regions of BioINSouth are beneficiaries of ToBeReal services
CORDIS-258477	BOOST4BIOEAST	BOOSTing the bioeconomy transformation FOR (4) the BIOEAST region	CSA	Communication/dissemination exchange, synergies on WP2, mutual invitation to events

4.3 BioINSouth National/Regional Stakeholders' Databases

Seven databases of national stakeholders were compiled, through the mapping of bioeconomy-related research projects (EU and national), publications/patents, and input from partners. In the national/regional databases, an **additional categorisation** was made concerning the type of organisations, according to the **QH model.** The seven national DBs, correspond and include the eight BioINSouth regions:

1. Andalusia (Spain)
2. Asturias (Spain)
3. Campania (Italy)
4. Centro (Portugal)
5. Cyprus
6. Nouvelle-Aquitaine (France)
7. Peloponnese (Greece)
8. Slovenia

It is important to note this aspect, that the databases cover the entirety of all seven countries, and are developed in Microsoft Excel sheets, with the addition of pivot tables in which filtering per region can be applied. *(See Annexes 5.2, 5.3)*

In the following sections, the results of the national regional databases are discussed, providing insights on the proactivity of the BioINSouth regions, and their status.

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4.3.1 Andalusia and Asturias (Spain)

Table 4 Distribution of Spanish bioeconomy stakeholders among the 17 autonomous communities. (organisations with insufficient data were not included)

Autonomous community	No. of organisations
Andalusia	153
Aragon	58
Asturias	54
Balearic Islands	16
Basque Country	155
Canary Islands	25
Cantabria	13
Castile and León	82
Castilla-La Mancha	15
Catalonia	314
Extremadura	31
Galicia	69
La Rioja	15
Madrid	292
Murcia	54
Navarre	35
Valencian Community	176

In Spain, a total of 1631 organisations were identified as relative to the bioeconomy sector, and their distribution in the 17 Autonomous Communities is shown in Table 4. In the top 5 positions are Catalonia, Madrid, Valencia, and the Basque country.

Andalusia in the 6th position, with 153 organisations identified, presents a promising region in the field of bioeconomy. On the other hand, **Asturias**, with 54 identified stakeholders, represent a developing region. The presence of active organisations in each region, must be interpreted along with the specificities of the region, for example the presence of universities and research organisations, the population, the geographical features, the existence of regional bioeconomy framework, etc.

The distribution of organisations according to the QH model (academia, industry, civil society, government), is similar in both Asturias and Andalusia, with the industrial sector representing the largest group, followed by academia (higher or secondary education and research organisations).

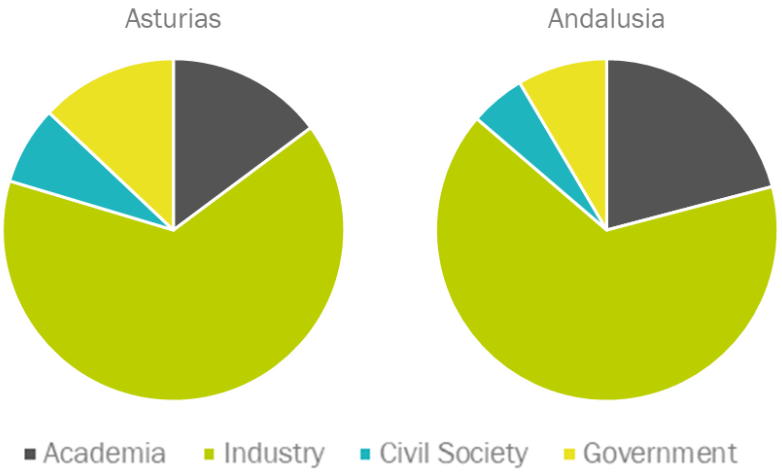

Figure 12 Organisations in Asturias and Andalusia autonomous communities, categorised according to the quadruple helix model

4.3.2 Centro (Portugal)

The region Centro of Portugal, is one of the statistical regions of Portugal. The districts with major administrative status inside this region are Coimbra, Aveiro, Viseu, Leiria, Castelo Branco, and Guarda, Centro is one of the seven Regions of Portugal (NUTS II subdivisions). It is also one of the regions of Europe, as given by the European Union for statistical and geographical purposes. Its area totals 28,462

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km². As of 2011, its population totalled 2,327,026 inhabitants. In Portugal, 922 organisations were identified as related to bioeconomy, and their distribution in the districts is presented in the table. As anticipated, Porto and Lisbon are the top two districts with large representation, followed by Braganca and Coimbra. Specifically for the Centro region, comprising Coimbra, Aveiro, Viseu, Leiria, Castelo Branco, and Guarda, it has a strong presence with Coimbra taking the lead.

Table 5 Distribution of Portuguese bioeconomy stakeholders among the districts (organisations with insufficient data were not included)

District	No. of organisations
Castelo Branco	17
Coimbra	56
Evora	14
Faro	23
Madeira	20
Porto	203
Santarem	36
Vila Real	16
Aveiro	43
Azores	26
Beja	14
Braga	56
Braganca	8
Guarda	11
Leiria	38
Lisbon	170
Setubal	26
Viana do Castelo	11
Portalegre	6
Viseu	25

The distribution of organisations according to the QH model (academia, industry, civil society, government) in Centro present similarities with Spain, with the industrial sector representing the largest group, followed by academia (higher or secondary education and research organisations), and civil society. Especially the civil society seems more active in Centro region, showing a mobilisation of policy makers in the last years. As expected, the most active organisations come from academia and are the Universities of Aveiro and Coimbra, while in the industrial/corporate sector the C&D company Globaz appears to have increased activity in the education concerning bioeconomy, and the Portugese industrial biotechnology company Biotrend, specialising in the research, development and scale-up of bioprocesses, with a strong focus on industrial and marine biotechnology: Collectively, the region is strongly directed in marine resources and aquaculture, as well as textiles and biopolymers.

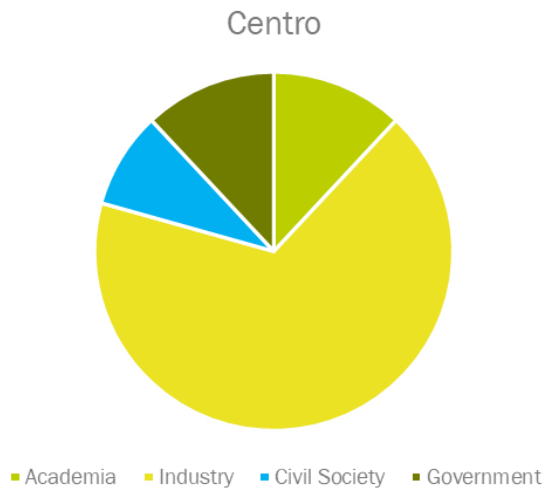

Figure 13 Organisations in Centro region categorised according to the quadruple helix model

4.3.3 Campania (Italy)

In Italy, a total of 1495 organisations were identified, with broader interests in bioeconomy value chains. As seen in the table, most of the activity is concentrated in the regions of Emilia-Romagna, Lazio,

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Table 6 Distribution of Italian bioeconomy stakeholders among the regions (organisations with insufficient data were not included)

Region	No. of organisations
Abruzzo	15
Basilicata	11
Calabria	12
Campania	75
Emilia-Romagna	121
Friuli Venezia Giulia	54
Lazio	188
Liguria	4
Lombardy	260
Marche	35
Piedmont	160
Puglia	39
Sardinia	21
Sicily	36
Trentino-Alto Adige	50
Tuscany	146
Veneto	107
Valle d' Aosta	1

Lombardy, Piedmont, Tuscany and Veneto. This is partially explained by the economic and industrial strength of these regions (they have a high GDP per capita), their high population, the specialised cluster infrastructure and innovation hubs, and the policy for rural development, that is closely related to bioeconomy. In Campania, 75 bioeconomy related organisations are identified, and the landscape is characterised from the strong presence of the academic sector, increased participation of industry, and decreased involvement of civil society and government. This is a particular challenge for Campania, the involvement of local administration and civil society, that BioINSouth aims to address. Campania is academically strong in absolute terms, boasting one of Italy's foremost universities (UNINA), a broad research base and substantial output, but it still lags the very top regions when measured on per-capita funding, international rankings and graduate retention. Campania benefits from the strong industry/academia collaboration, nevertheless the universities and research units excel in the disciplines of life sciences, engineering, and humanities, leaving the bioeconomy exclusive studies lagging behind.

Nevertheless, Campania is the leading Southern region for bio-based and green-tech companies, with the number of employees in the green economy growing by over 6% in recent years[5]. Between 2015 and 2020, the number of biotech firms in Campania jumped by 69% (to 59 companies), representing 36.9% of all Southern-Italian biotech players and 7.5% of the national total.[6] Currently, Campania's economic backbone is services (mainly tourism-related), followed by the agrifood and pharmaceutical sector.

[5] investincampania.regione.campania.it.
[6] Innovation, the growth of Campania in Ambrosetti's position paper - Europe Campania

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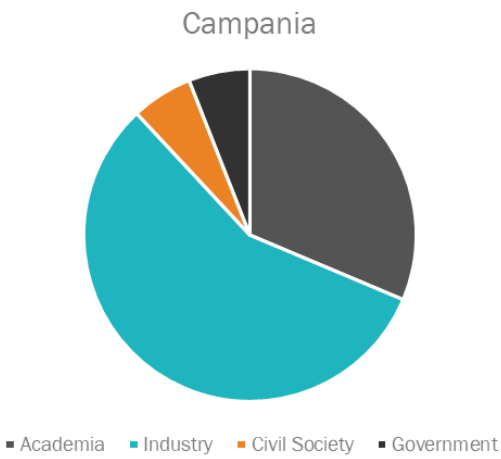

Figure 14 Organisations in Campania region categorised according to the quadruple helix model

4.3.4 Nouvelle-Aquitaine (France)

In France, a total of 2356 organisations related to bioeconomy, were identified. A large number of them, were not sufficiently characterised for their locality, due to insufficient name and locality data. From the 1569 stakeholders with sufficient data, it is observed that the majority is concentrated in the region of Ile-de-France (557), followed by Rhone-Alpes and Provence-Alpes-Cote d'Azur.

Table 7 Distribution of French bioeconomy stakeholders among the regions (organisations with insufficient data were not included)

Region	No. of organisations
Alsace	35
Aquitaine	85
Auvergne	24
Basse-Normandie	16
Bourgogne	30
Bretagne	82
Centre	30
Champagne-Ardenne	14
Franche-Comte	17
Haute-Normandie	24
Ile-De-France	557
Languedoc-Roussillon	75
Limousin	9
Lorraine	25
Midi-Pyrenees	104
Nord-Pas-De-Calais	53
Pays de la Loire	58
Picardie	15
Poitou-Charentes	13
Provence-Alpes-Cote d'Azur	111
Rhone-Alpes	192

Due to the sise of France, there is large variability among the prevalent value chains. For the region of Nouvelle-Aquitaine, 85 organisations were identified as related to bioeconomy. The top-5 positions are research related. As seen in the figure below, Nouvelle-Aquitaine is the only from the BioINSouth regions that academia dominates the stakeholders, followed by industry.

This correlation is very interesting, since Nouvelle-Aquitaine is one of the most mature bioeconomy ecosystems in Europe, fostering agriculture, forestry, and marine and coastal activities. The Nova Terra Roadmap updated in 2023, sets out six ambitions—preserving natural resources, circularity, agroecology, renewable energies, sustainable mobility and bio-based industry—to 2030, and provides a solid policy support framework for advancing bioeconomy further.

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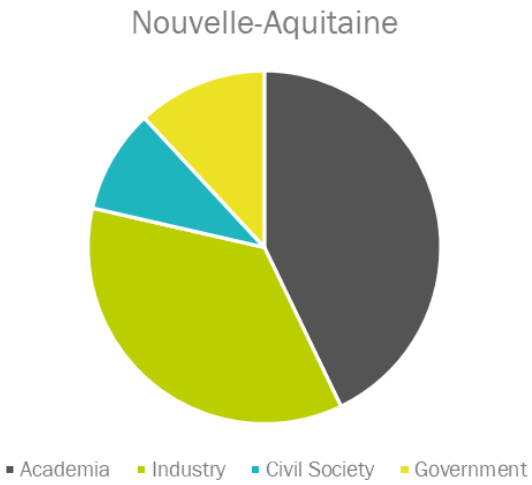

Figure 15 Organisations in Nouvelle-Aquitaine region categorised according to the quadruple helix model

4.3.5 Peloponnese (Greece)

In Greece, a total of 1164 bioeconomy related stakeholders were identified, concentrated as seen in the table in regions with dense population, such as Attica that includes the capital of Athens, and Aegean Islands and Eastern Macedonia, comprising the metropolitan region of Thessaloniki, the 2nd largest city of Greece. The regions in which the stakeholders were classified, follow the Greek postal code system, that is not directly correlated with administrative regions. The Peloponnese is a name used for both an administrative region, and a geographical region, which in our classification appears along with the Ionian Islands.

Table 8 Distribution of Greek bioeconomy stakeholders among the greater regions (organisations with insufficient data were not included)

Region	No. of organisations
Attica	553
Peloponnese & Ionian	65
Thessaly	20
Dodecanese & Cyclades	45
Northern Greece	52
Aegean Islands & E. Macedonia	219
Epirus & W. Greece	50
Central Greece & Sporades	20
Crete	62

In Peloponnese and the Ionian Islands, a total of 65 bioeconomy oriented stakeholders were identified, distributed among the categories of the quadruple helix, as shown in the figure below. Two companies appear to be active in funded projects and bioeconomy value chains, namely Rezos (agriculture) and Bioassist (software solutions) both of them based in the wider region of Patras, in proximity with the University of Patras, suggesting a spill over effect from academia towards industry. In the Peloponnese, the primary sector, and in particular agriculture, remains the dominant engine of regional income, and specifically olive oil production, and diversified crops (citrus and oranges, grapes) and livestock (sheep and goats).

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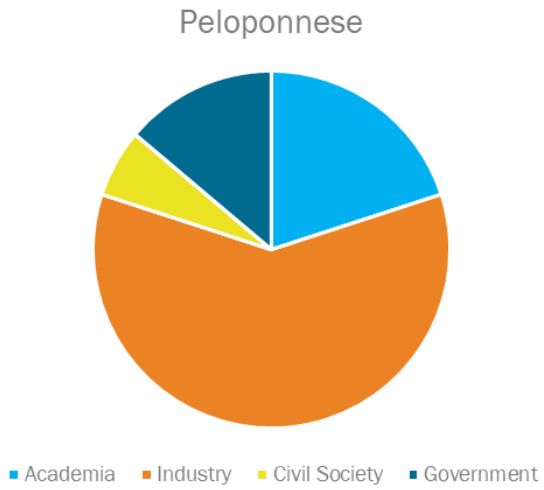

Figure 16 Organisations in Peloponnese and Ionian Islands region categorised according to the quadruple helix model

4.3.6 Cyprus

Due to its small sise, Cyprus is included in the BioINsouth regions in its entirety. 129 bioeconomy related stakeholders were identified in Cyprus, distributed among the QH categories, as shown in the figure below. An interesting observation is that Cyprus has an active presence of the government, showing an increased interest in the transition to bioeconomy. As, expected, universities and research institutes, have a strong presence in funded research projects, whereas the company eBOS technology (software solutions) has a high participation from the industrial/corporate sector.

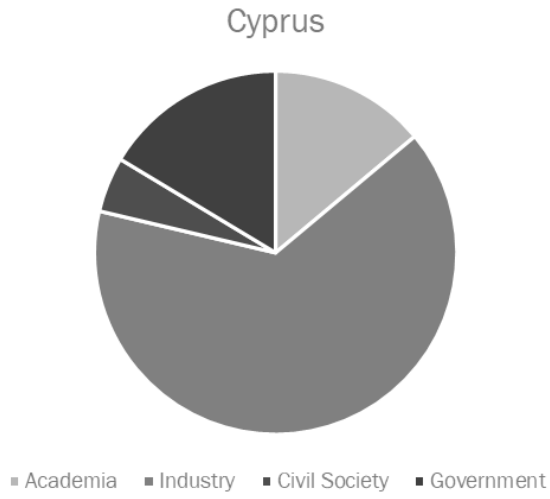

Figure 17 Organisations in Cyprus categorised according to the quadruple helix model

4.3.7 Slovenia

In Slovenia, 198 bioeconomy related organisations were identified in total. It is observed the increased representation of the government in funded projects, a fact that points to increased mobilisation in terms of policy development and will to implement bioeconomy practices.

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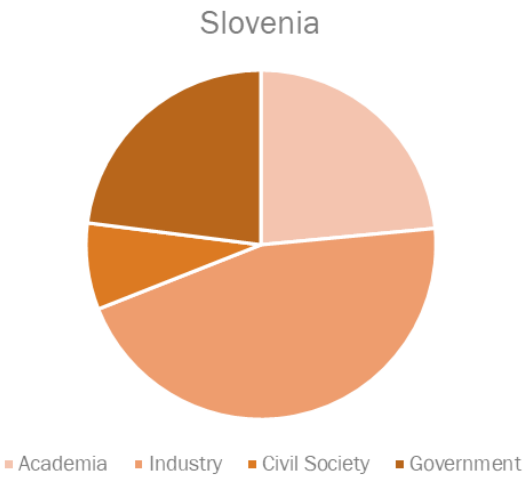

Figure 18 Organisations in Slovenia categorised according to the quadruple helix model

Among the most active organisations are the university of Ljubljana, the "Jožef Stefan" institute, and the National Institute of Chemistry. Slovenia's bioeconomy is at a formative but rapidly developing stage. While the country boasts abundant biological resources and strong research capacity, its full economic potential remains under-exploited. It is important to notice that the economy of Slovenia relies mainly in services, and much less in industry, and agriculture.

5 The BioINSouth Stakeholder Platform

5.1 Introduction

Across Southern Europe, the bioeconomy is characterised by diverse landscapes, fragmented value chains and a wide range of stakeholders—from family farms and artisanal producers to research institutes, policy makers and emerging biotechnology ventures. A dedicated stakeholder platform is essential to weave these actors into a coherent community capable of accelerating innovation, sharing best practices and aligning regional priorities.

First, resource flows in the Mediterranean bioeconomy often cross borders: biomass produced in one region may be processed in another, while research breakthroughs in marine biotechnology can benefit agrifood clusters elsewhere. Without a common digital forum, opportunities for collaboration are frequently overlooked, and critical knowledge remains siloed. A stakeholder platform overcomes these barriers by providing a single entry point where project calls, technical guidelines and success stories are published in real time.

Second, policy frameworks and funding instruments—whether under national recovery plans or EU Smart Specialisation Strategies—require timely input from a broad spectrum of participants. Farmers, SMEs and NGOs must be consulted on practical constraints and emerging needs, while researchers and regional authorities need rapid feedback on the impact of policy measures. By centralising surveys, working-group discussions and feedback channels, a stakeholder platform ensures that programmes are co-designed with the very actors they aim to support.

Finally, capacity building and community learning depend on accessible, tailored content. Workshops, webinars and case-study repositories become far more effective when promoted through a unified portal.

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Stakeholders can subscribe to topic-specific updates—such as circular-agriculture techniques, marine-biotech advances or biowaste valorisation—ensuring that each participant receives the precise information they need to innovate and compete.

In summary, a Southern Europe bioeconomy stakeholder platform is not merely a communication tool but the backbone of an integrated ecosystem. It bridges geographical and disciplinary divides, fosters co-creation of policy and practice, and accelerates the transfer of knowledge—ultimately strengthening the region's capacity to build a sustainable, competitive bioeconomy.

5.2 The BioINSouth stakeholder platform environment

The BioINSouth Stakeholder Platform has been established as a central hub for the Southern Mediterranean bioeconomy community. Upon registration, users will be connected with agrifood producers, researchers, policymakers and entrepreneurs from Greece, Italy, Spain, Cyprus and beyond.

Tailored newsletters, event invitations and calls for proposals will be received, covering topics such as circular agriculture, agro-industry valorisation, marine biotechnology and biowaste management. Exclusive resources—policy briefs, technical reports and best-practice case studies prepared by BioINSouth experts—will be made available for download.

Participation in online surveys, working groups and co-creation workshops will be invited, ensuring that stakeholder feedback is incorporated into pilot demonstrations and regional roadmaps under the EU's Smart Specialisation Strategies.

To initiate access, the BioINSouth website should be visited and the "Sign-up" button selected. A brief profile—detailing role, organisation and areas of interest—will be completed, and email confirmation will be required. Upon confirmation, the platform dashboard will be unlocked.

Figure 19 Home page of the BioINSouth website, and buttons for signing up and login to the BioINSouth Stakeholder Platform.

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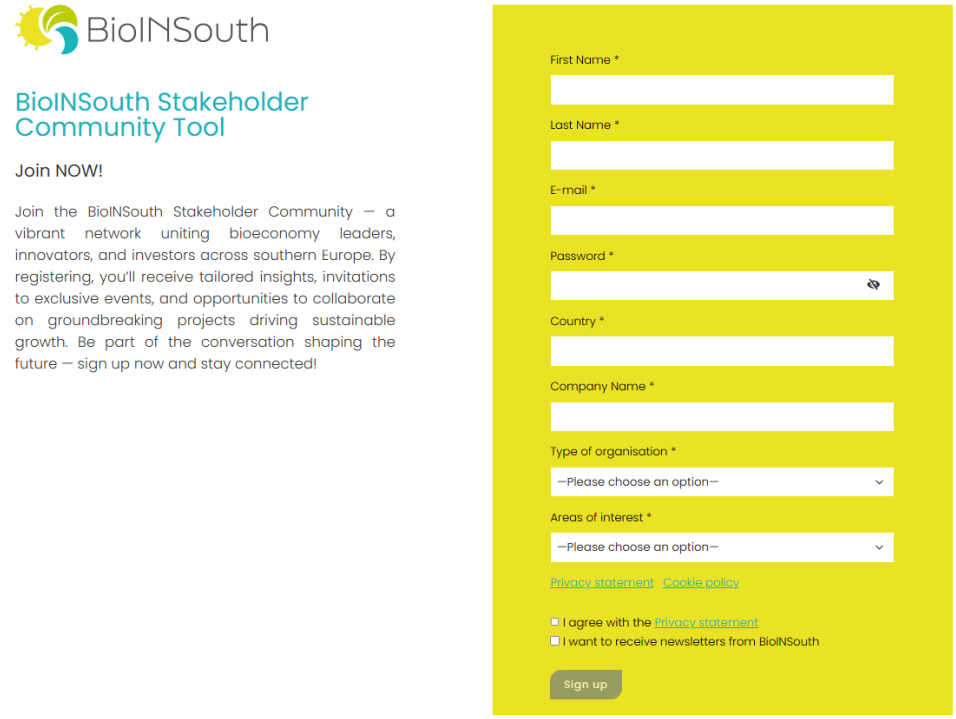

Figure 20 Welcome pop-up of the BioINSouth Stakeholder Platform, and fields to be completed

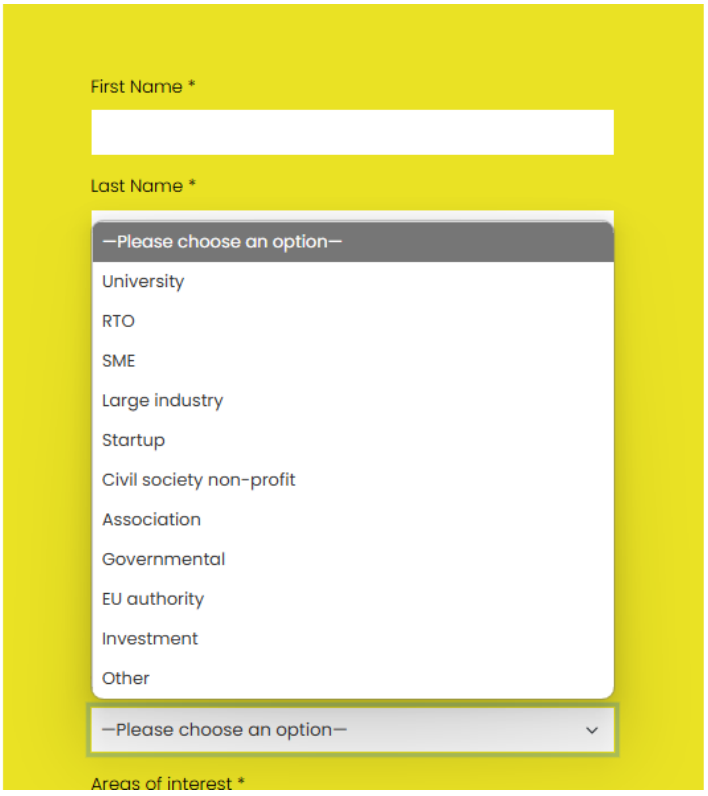

Figure 21 The options for defining the organisation type. We aimed for the specific categories, in order to have insights on the interests of the organisation, and the type of content that may be interested in.

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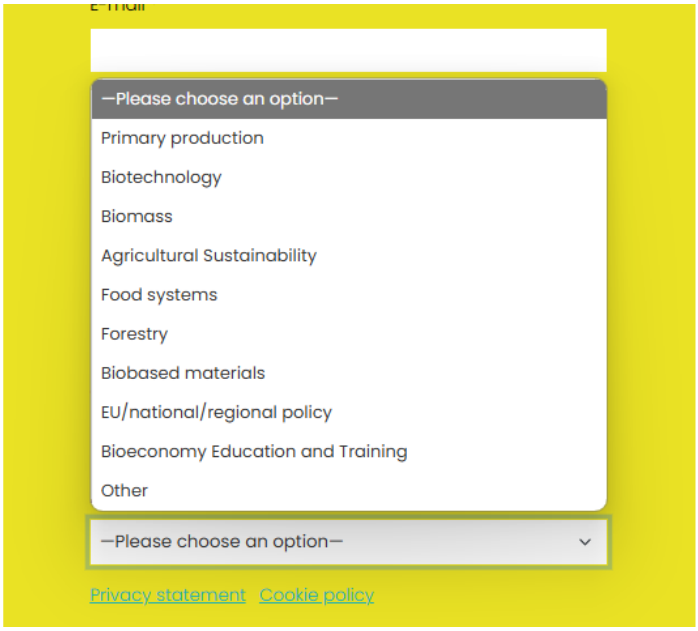

Figure 22 The options for defining the areas of interest for the stakeholders registering, according to the prevalent stakeholder categories and value chains

Upon registration to the platform, where the user can choose whether to be included in the newsletter as well, a confirmation e-mail will be sent, with a link that should be followed to continue registration.

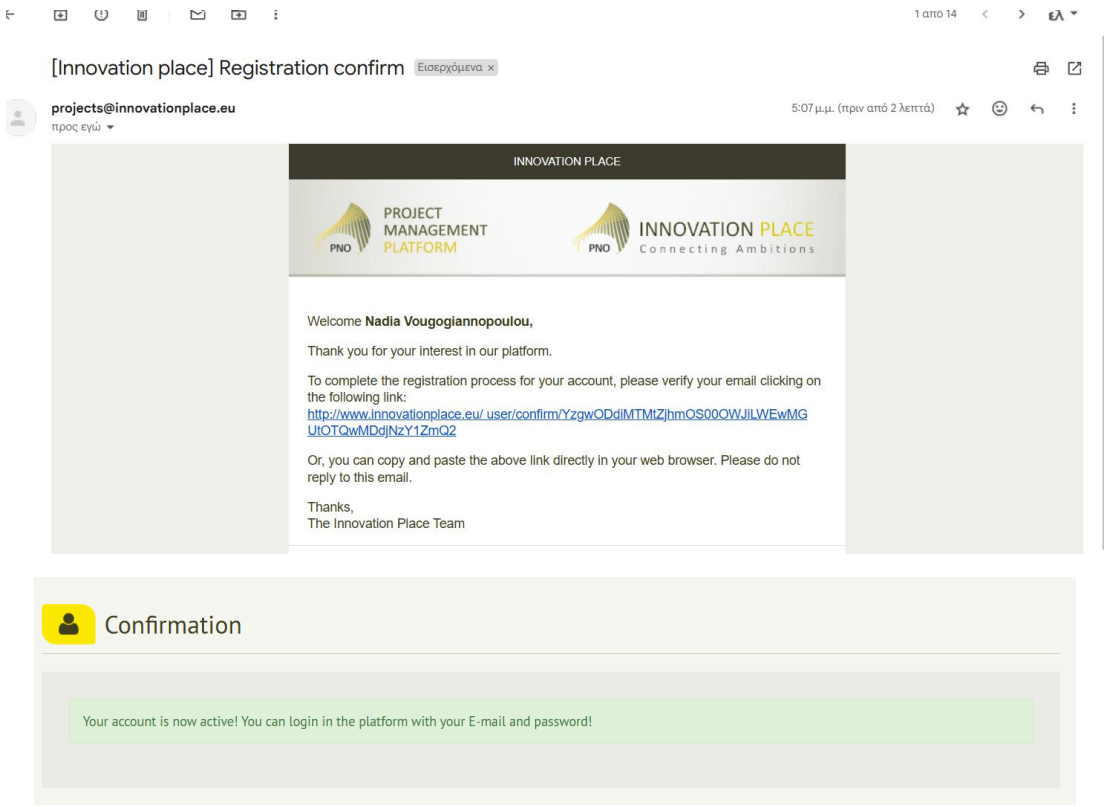

Figure 23 Confirmation e-mail for activation of the BioINSouth platform account

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The interface provides possibilities for several fields related to stakeholder networking and interaction as shown in the figures below.

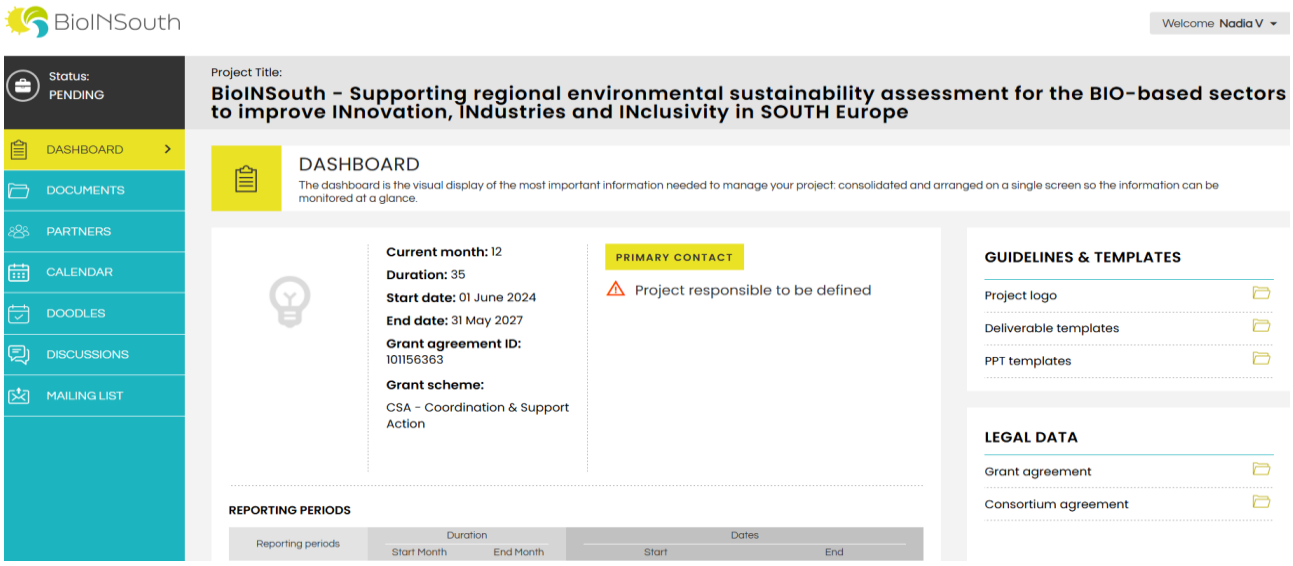

Figure 24 The dashboard of the BioINSouth platform showing the possibilities

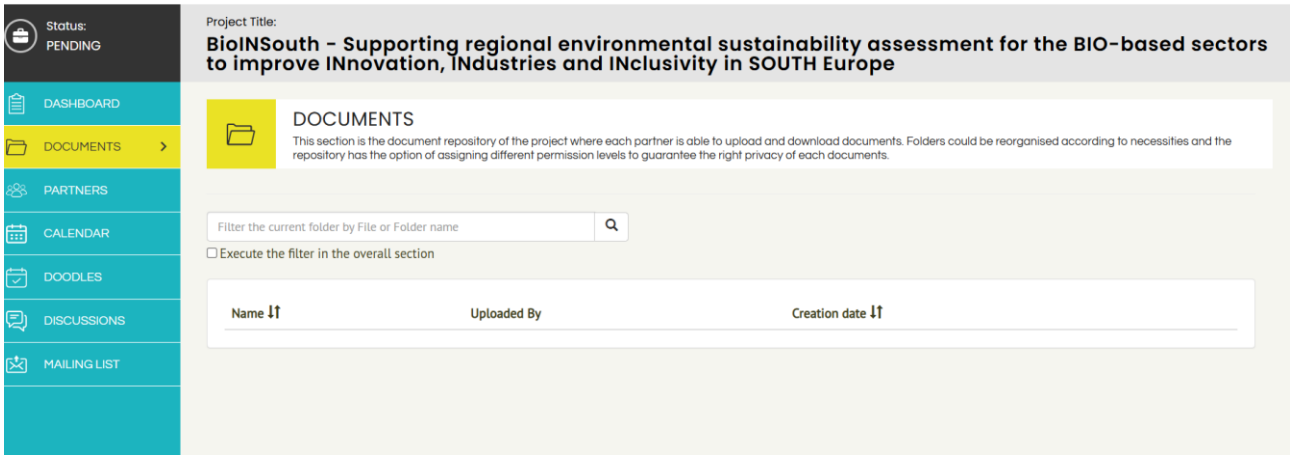

Figure 25 The documents tab, for uploading exclusive content accessible to stakeholders

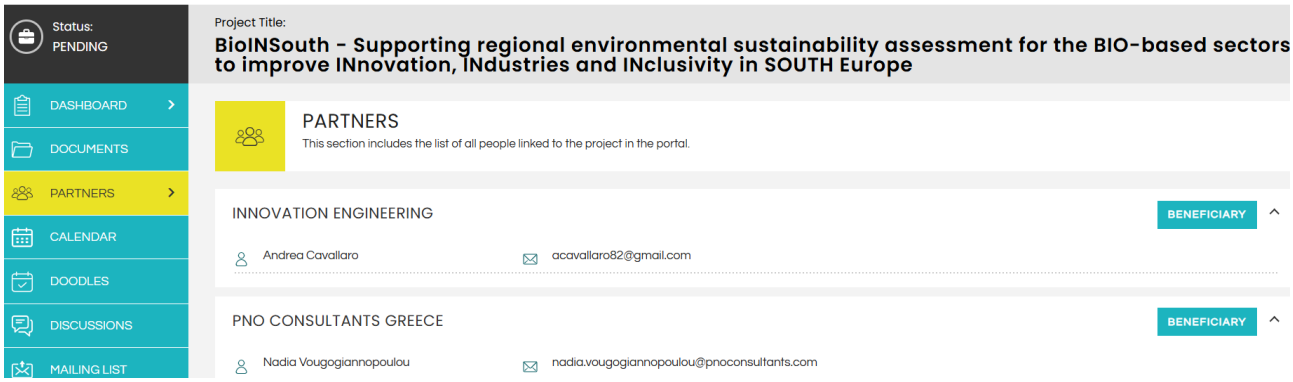

Figure 26 The partners tab showing the list of stakeholders related to the project's goals/objectives

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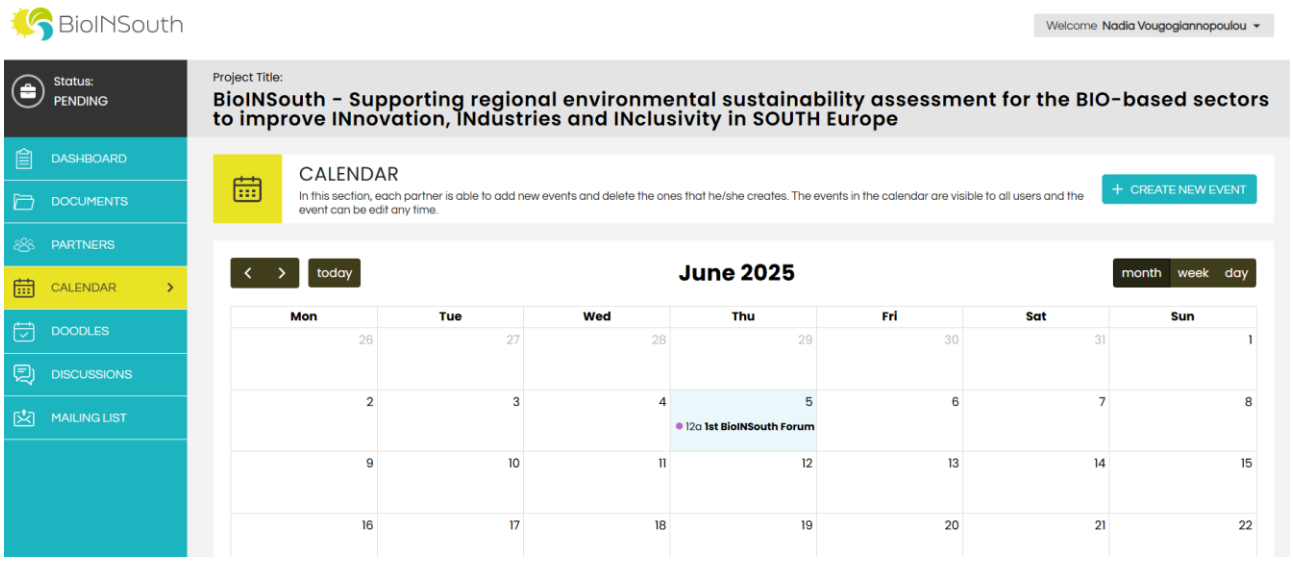

Figure 27 The calendar tab, with important intra or extra consortium public events

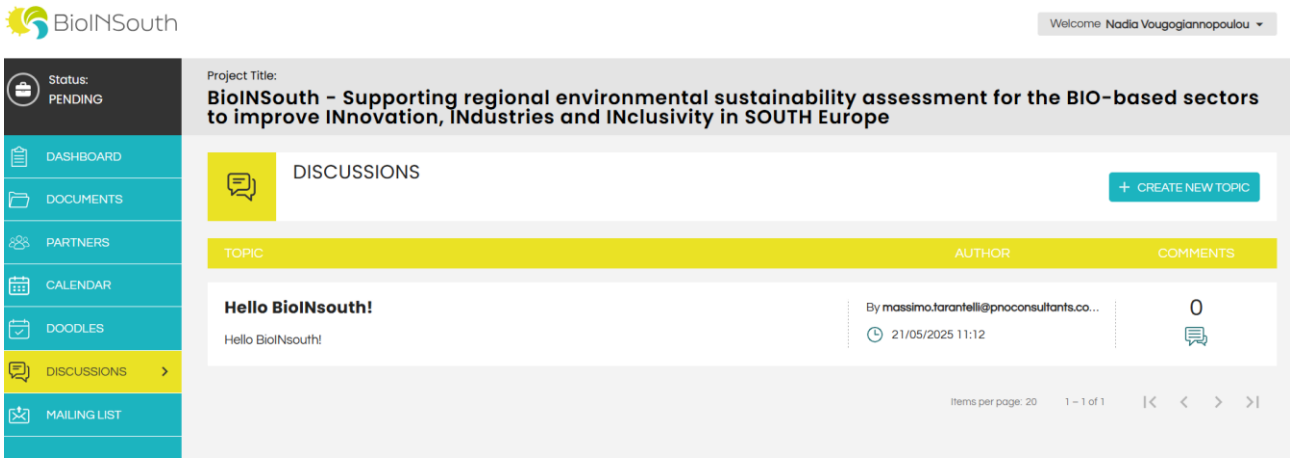

Figure 28 The discussions tab, a forum like interface for written interaction among stakeholders and/or project participants

5.3 BioINSouth platform content

Deliverable D2.2 is dedicated to the development of the stakeholder engagement platform environment. This includes the foundational setup required to support effective communication and collaboration among project stakeholders. The creation and dissemination of associated content—such as public deliverables, publishable summaries of results, general project information, press releases, and materials highlighting B2B opportunities and synergies—will be undertaken and reported under Work Package 7 (WP7), which focuses on outreach, dissemination, and exploitation activities.

6 Conclusion

The stakeholder analysis carried out by PNO Greece in BioINSouth is a strategic asset that extends beyond engagement—it is a policy-shaping instrument. By systematically identifying and classifying stakeholders across the Quadruple Helix in eight Southern European regions, the project has created a robust knowledge base that supports both regional innovation and evidence-based policymaking.

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The resulting databases serve as a critical foundation for aligning regional bioeconomy strategies with broader EU objectives, such as the Green Deal, the updated EU Bioeconomy Strategy, and Smart Specialisation Strategies. They enable policymakers to identify underrepresented groups, assess regional readiness, and design targeted interventions that reflect local capacities and challenges. Moreover, the analysis highlights structural gaps—such as limited civil society involvement or fragmented value chains—that must be addressed to ensure inclusive and resilient bio-based transitions.

While digital tools like the stakeholder platform facilitate communication, it is the depth and granularity of the stakeholder mapping that will inform the co-development of policy recommendations, support cross-regional coordination, and guide the integration of ecological limits into regional planning. As the EU shifts bioeconomy governance toward environmental impact and sustainability, this stakeholder intelligence becomes indispensable for crafting adaptive, regionally grounded, and forward-looking bioeconomy policies.

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BioINSouth Info Box

The BioINSouth project aims to support decision-makers to incorporate considerations of ecological limits into their regional bioeconomy strategies and roadmaps relevant to circular bio-based activities. We aim to develop guidelines and digital tools, considering the safe and sustainable by design (SSbD) assessment framework, to support the adoption of innovative methodologies to assess environmental impacts in multiple industrial bio-based systems, increasing regional competitiveness and innovation capacity, and contributing to the EU fair & green transition.

Find out more:

Website: https://www.bioinsouth.eu/
LinkedIn: https://www.linkedin.com/company/104361906/
YouTube: https://www.youtube.com/@BioINSouth
Contact coordinator:
SPRING the Italian Circular Bioeconomy Cluster info@clusterspring.it

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