

Enabling transition towards circular and systemic BIOeconomy model regions by a Regions-to-Regions approach

Database of user-friendly tools for regional cooperation towards circular and systemic bioeconomy model regions

Deliverable 2.2

This deliverable has not yet been reviewed by the European Commission. Its content might therefore change as a result of the review process.

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Glossary

AT: Assessment Tools
 BIOC: BIOCOM Interrelations
 FZJ: BioökonomieREVIER, Forschungszentrum Jülich
 KVC: Kveloce
 BHCZ: BIOEAST HUB CR, Czech Republic

BIO2REG in a nutshell

A circular bioeconomy is essential for achieving the EU's sustainability goals. However, the implementation of a regional bioeconomy is fraught with challenges. Bioeconomy model regions offer a systemic approach to the transition to sustainable development, based on circular economy concepts. The EU-funded BIO2REG project aims to help greenhouse gas-intensive economies unlock their circular bioeconomy potential by becoming Bioeconomy Model Regions. The project will promote regional networking, interregional exchange and cooperation, and provide regional stakeholders with a conceptual framework for regionalisation in bioeconomy model regions. This includes mapping best practices in a circular and sustainable bioeconomy, assessing bioeconomy potential, providing mentoring and training, forming transition alliances and making policy recommendations. The project adopts a multi-stakeholder approach, developing tools and guidelines in collaboration with regional stakeholders and engaging with regions through guided exchanges on the ground.

Find out more:

Website: <https://bio2reg.eu>

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1 Executive summary

This deliverable presents a curated Database of User-Friendly Tools for Regional Cooperation Towards Circular and Systemic Bioeconomy Model Regions, developed under Task 2.2 of the BIO2REG project. The work addresses the challenge that many valuable digital tools for bioeconomy development remain underutilised due to limited awareness at regional level.

The research employed a systematic methodology comprising comprehensive tool collection from 21 bioeconomy initiatives, followed by rigorous evaluation against four criteria: usability, accessibility, relevance, and interactivity. Three independent evaluators applied a standardised rubric, with selection criteria emphasising usability, accessibility, and relevance, whilst treating interactivity as a desirable but non-mandatory feature.

The resulting database provides regional stakeholders with practical, quality-assured resources to support bioeconomy development, contributing to BIO2REG's objective of enhancing regional cooperation towards circular and systemic bioeconomy models. The database will be accessible through the project website, serving individuals, civil society organisations, policy makers, and industry stakeholders engaged in regional bioeconomy development.

2 Introduction

The European Union's transition to a sustainable and circular bioeconomy requires effective cooperation and knowledge exchange between diverse stakeholders across different regions. To facilitate this collaboration, numerous digital tools have been developed to support bioeconomy development at various levels. However, many of these valuable resources remain underutilised due to limited awareness at the regional level.

This deliverable addresses Task 2.2 of the BIO2REG project, which focuses on screening and assessing user-friendly interaction tools for regional bioeconomy stakeholders. Led by KVC with support from FZJ, this task involved conducting comprehensive desk research to map and evaluate knowledge exchange tools, with particular emphasis on IT-based solutions available at the European level. The assessment examined these tools based on their user-friendliness, functionalities, practicability for different regional stakeholders (including individuals, civil society, policy makers, and industry), as well as their relevance and potential for scaling up.

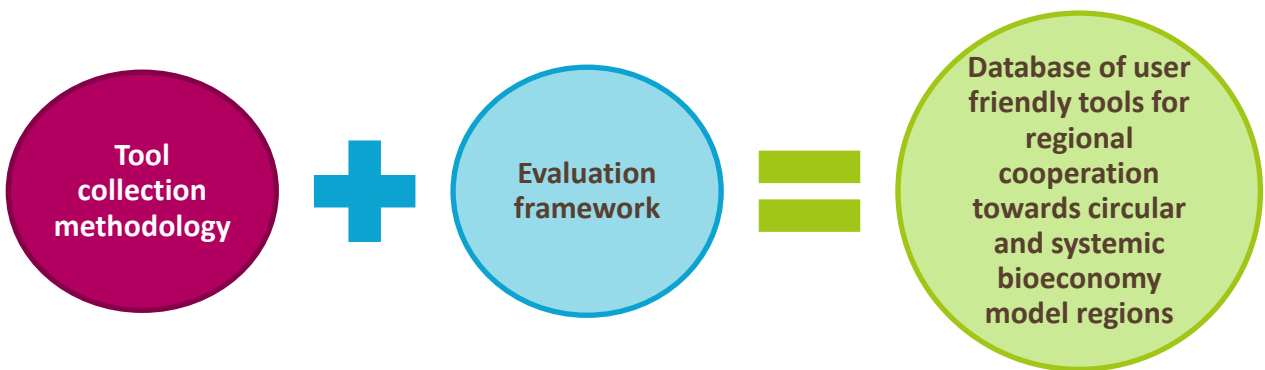
The primary objective of this deliverable is to present a curated database of digital tools that can effectively support regional stakeholders in developing and implementing bioeconomy strategies. By making these tools accessible through the BIO2REG project website, this work aims to enhance the capacity of regions to adopt more circular and systemic approaches to bioeconomy development.

This document is structured in five main sections. Following this introduction, Section 3 details the methodology employed in this mapping process, including both the tool collection process and the evaluation framework used to assess the tools. Section 4 presents the database of selected tools that met the established quality criteria. Finally, Section 5 offers conclusions and outlines next steps for further development and application of these resources. Additionally, two annexes provide supplementary information: Annex 1 lists the bioeconomy initiatives identified during the research process, and Annex 2 presents the detailed evaluation rubric used to assess the digital tools.

3 Methodology

This chapter outlines the systematic approach developed to create the database of user-friendly tools for regional cooperation towards circular and systemic bioeconomy model regions. As illustrated in Figure 1, the methodology comprises two complementary components: the tool collection methodology, which established protocols for identifying and gathering relevant digital tools, and the evaluation methodology, which provided a framework for assessing their usability, interactivity, relevance and accessibility. Together, these methodological components ensured a comprehensive process for developing a database that meets the specific needs of stakeholders engaged in regional bioeconomy development. The following sections detail each component of this methodology.

Figure 1. Methodology



Source: own elaboration

3.1 Tool collection methodology

The collection of digital tools for bioeconomy development followed a systematic approach consisting of 3 steps to ensure wide coverage and relevance:

Initial Scanning of bioeconomy initiatives: Identification of existing bioeconomy initiatives and projects across different geographical regions and implementation stages. A total of 21 distinct projects and initiatives were identified, representing various countries in the bioeconomy sector (See Annex 1).

Compilation of bioeconomy related digital tools: each initiative was systematically examined to identify whether they had developed or utilised digital tools related to bioeconomy development. This preliminary scan provided the foundation for the initial database of 44 bioeconomy related tools.

To ensure comprehensive coverage, the initial database was augmented through:

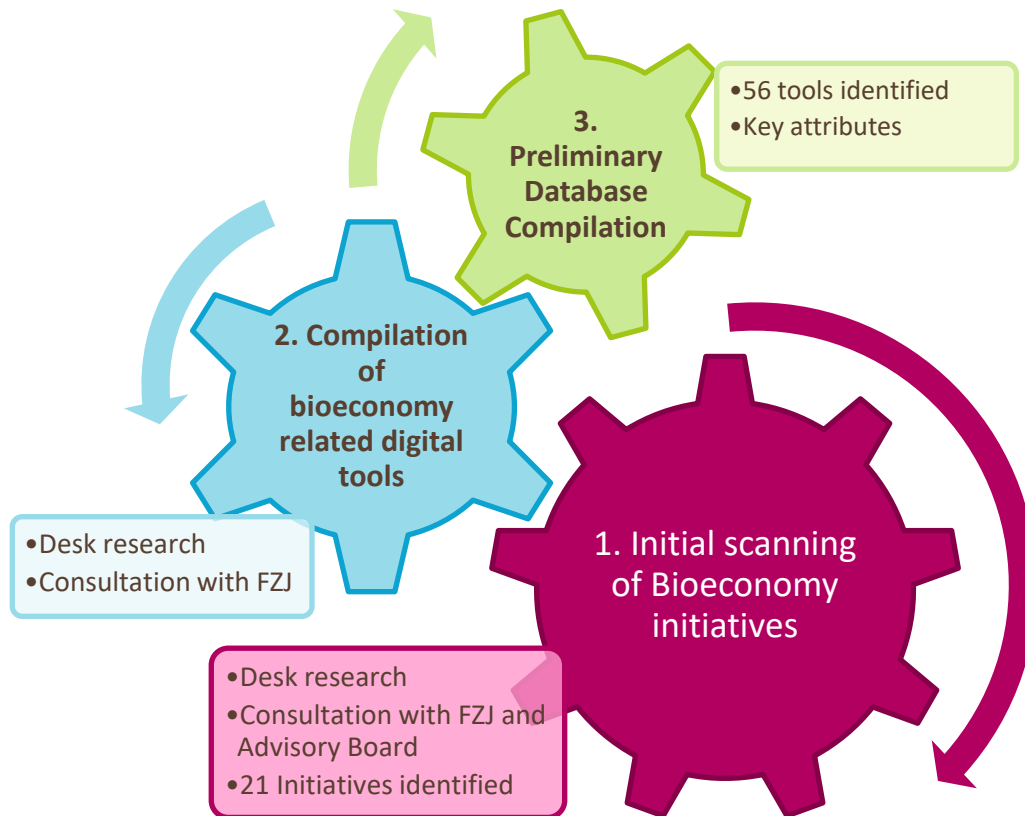
- Direct internet searches: Targeted online searches were conducted using specific keywords related to bioeconomy digital tools, interactive platforms, and decision support systems.
- Partner collaboration: Project partners from the BIO2REG consortium were invited to contribute by identifying additional tools not captured during the initial scans. This collaborative approach leveraged the collective expertise and networks of the consortium to enhance the comprehensiveness of the database.

Preliminary database compilation: All identified tools were compiled into a preliminary database, containing 56 tools, documenting key attributes such as:

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- Tool name and developer
- Brief description of functionality
- Target audience and primary application area
- Access information (URL, availability)
- Initial observations on features and capabilities

Figure 2. Tool collection methodology



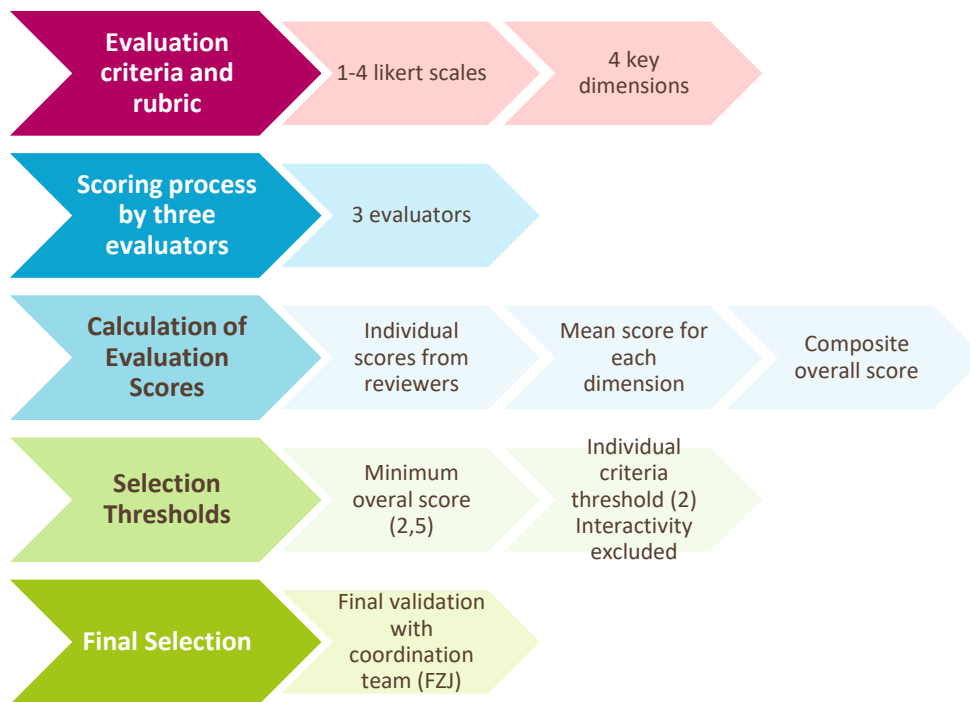
Source: own elaboration

This preliminary compilation served as the foundation for the subsequent evaluation phase.

3.2 Evaluation framework

A structured evaluation framework was developed to systematically assess each tool according to four critical criteria to be selected for the final database.

Figure 3. Evaluation framework



Source: own elaboration

Evaluation criteria and rubric: an evaluation rubric was designed to assess each digital tool across four key dimensions (See Annex 2):

- **Usability:** Assessing the tool's interface design, technical accessibility, documentation quality, and user-centred considerations.
- **Accessibility:** Evaluating the openness of access, language availability, device responsiveness, and compliance with accessibility standards.
- **Relevance:** Measuring the tool's focus on regional bioeconomy needs, information currency, practical applicability, and adaptation to the European context.
- **Interactivity:** Assessing the level of dynamic engagement, customisation capabilities, visualisation features, and collaborative functionalities.

For each criterion, a four-point scoring scale was established:

- Score 1 (Poor): Indicates significant limitations that substantially impact functionality
- Score 2 (Acceptable): Indicates basic functionality with notable room for improvement
- Score 3 (Good): Indicates strong performance with minor limitations
- Score 4 (Excellent): Indicates exceptional performance with comprehensive capabilities

Scoring process by three evaluators: The evaluation process engaged 3 representatives from the project consortium (FZJ, BIOC and KVC) to ensure objective assessment. Each evaluator independently assessed the tools using the established rubric, documenting specific observations for each criterion.

Calculation of evaluation scores: For each tool, the evaluation process yielded:

- **Individual scores from each reviewer** across the four criteria (Usability, Accessibility, Relevance, and Interactivity)

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- **An arithmetic mean score for each criterion**, calculated from the three independent assessments
- **A composite overall score**, reflecting the tool's performance across all dimensions. Recognising that certain criteria hold greater significance for the BIO2REG project's objectives, a weighted approach was applied to the final scoring:
 - Relevance: 45% - Prioritising tools that directly support regional bioeconomy development needs
 - Usability: 30% - Emphasising the importance of user-friendly interfaces and documentation
 - Interactivity: 15% - Recognising the value of dynamic engagement and customisation capabilities
 - Accessibility: 10% - Acknowledging the need for broad access whilst balancing other priorities

This weighting system ensures that tools with particular strength in addressing regional bioeconomy needs receive appropriate recognition, whilst still requiring adequate performance in other dimensions.

Selection thresholds: To qualify for inclusion in the final database, tools were required to meet the following criteria:

- **Minimum overall threshold:** A weighted average score of at least 2.5 across all criteria (between 'Acceptable' and 'Good' on the evaluation scale)
- **Individual criteria thresholds:** No individual criterion score below 2.0 ('Acceptable') for Usability, Accessibility, and Relevance, whilst Interactivity is considered a desirable enhancement rather than a mandatory requirement. This exception for Interactivity acknowledges that some valuable tools may provide excellent content and functionality despite offering limited interactive features.

Final Selection Process: The selection process involved:

- Calculation of weighted scores for each tool based on the arithmetic means from the three evaluators
- Application of the selection thresholds to identify qualifying tools
- Review of borderline cases, particularly where evaluator scores showed significant divergence
- Final validation of the selected tools by the project team to ensure alignment with the BIO2REG project objectives

This methodology strikes an appropriate balance between quantitative assessment and qualitative considerations through its systematic evaluation framework, ensuring that the final database comprises tools that genuinely deliver value for stakeholders seeking to develop regional bioeconomy initiatives.

4 Database of selected tools

Based on the described methodology, 17 tools were included in the final database of user-friendly interactive tools for regional bioeconomy stakeholders, presented below and uploaded to BIO2REG webpage: https://bio2reg.eu/wp-content/uploads/BIO2REG_D2.2-Database_v1.0.pdf

Name	Type	Bioeconomy Maturity level	Short description	Project / Initiative	Links
B2B matchmaking online tool	Collaboration	Emerging; Developing	Business-to-business matchmaking online tool that enables interested stakeholders (SMEs, large companies, R&D institutions, universities, etc.) to build partnerships that will result in concrete projects or cooperation. The platform is a “marketplace” where bioeconomy players can search and meet potential partners from other regions.	CEE2ACT	https://www.cee2act-vcg.com/
BIC Funding Platform and Database	Databases and digital platforms	Emerging; Developing	Platform to better connect industry members with European regions. The digital platform focuses on creating local value chains and access to finance, helping regions and industry to make contact based on mutual interest.	Bio-based Industries Consortium	https://biconsortium.eu/regional-funding-platform
Bio-Circularity Label	Digital traceability and certification systems	All	The HOOP Circularity Label tool is an instrument to understand the current performance of a city/region regarding the implementation of bio-circular measures.	HOOP	https://www.hoop-hub.eu/circularity_label.html https://www.hoop-hub.eu/circularity_label.html#
Bioregions knowledge platform	Case studies and best practices	Emerging	This Knowledge platform provides publications, factsheets and projects related to regions that have taken the lead in making transformative changes towards a circular, forest-based bioeconomy	Bioregions	https://bioregions.efi.int/knowledge/

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Name	Type	Bioeconomy Maturity level	Short description	Project / Initiative	Links
Circular Valuation Method	Financing tools	Developing; Mature	The HOOP Circular Valuation method is a clear and simple method for companies and public bodies to assess whether circular projects are financially attractive.	HOOP	https://hoop-hub.eu/circular_valuation.html https://hoop-hub.eu/circular_valuation.html#
EU Bioeconomy Country Dashboards	Databases and digital platforms	All	Latest available information on national strategies, regional strategies, Institutions, Initiatives, Jobs and wealth in the bioeconomy, and data related to Biomass in Forestry and Algae. All categorised by country / region.	Knowledge Centre for Bioeconomy - European Commission	https://knowledge4policy.ec.europa.eu/visualisation/bioeconomy-different-countries_en
EU Bioeconomy Monitoring System Dashboards	Indicators and metrics	All	Overview of European trends in indicators related to the EU Bioeconomy. Information to monitor all areas of the bioeconomy. Interactive dashboard that allows to track the bioeconomy's progress towards sustainability in the EU and its Member States.	Knowledge Centre for Bioeconomy - European Commission	https://knowledge4policy.ec.europa.eu/bioeconomy/monitoring_en
Forestry Speed Dating	Case studies and best practices	Emerging; Developing	Bioregions Facility's Forestry Speed Dating is a dynamic event series showcasing innovative bioeconomy solutions. With a focus on knowledge sharing and collaboration, each event fosters sustainable growth in the forestry industry. Participants can learn about new innovations, connect with potential partners, and seize new opportunities.	Bioregions Facility	https://bioregions.efi.int/speed-dating/
Project Maturity Level	Financing tools	Developing; Mature	The HOOP Project Maturity Level (PML) is a standard guidance and ranking tool that evaluates the maturity level of the projects in accordance to several criteria to accomplish and reach, in order to improve their maturity and bankability to mobilise green financing and funding for its realisation.	HOOP	https://hoop-hub.eu/project_maturity_level.html https://hoop-hub.eu/project_maturity_level.html#

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Name	Type	Bioeconomy Maturity level	Short description	Project / Initiative	Links
SUSTRACK Case studies	Case studies and best practices	Emerging; Developing	SUSTRACK selected 10 case studies that are facing critical challenges within the current linear system and requiring a sustainable transition to circular biobased systems most urgently. These case studies belong to the four most carbon-intensive sectors, identified in the Bioeconomy Strategy, as industrial sectors that are relevant for the decarbonization of the EU economy: construction, textile, chemical and plastics. Discover promising applications selected by SUSTRACK as case studies, related barriers to the uptake of these bio-based solutions, relevant policy actions and limits of the current linear fossil based economy.	SUSTRACK	https://sustrack.eu/case-studies/
The Circular Bioeconomy Model Canvas	Guides and methodologies	Emerging; Developing	A tool for developing and updating regional circular bioeconomy governance models. It comprises elements such as the governance model's value proposition, beneficiaries, activities, partnerships, infrastructure and resources, cost structure and sustainability related costs and benefits.	Robin project	https://robintoolbox.web.auth.gr/index.php/circular-bioeconomy-governance-model-canvas/
The Environmental Protection Planning Tool	Indicators and metrics	Developing; Mature	A tool to identify non-environmentally friendly practices across environmental management areas and to prevent/mitigate adverse effects during the implementation of their circular bioeconomy policy.	Robin project	https://robintoolbox.web.auth.gr/index.php/environmental-protection-planning/
The Good Governance Practices	Case studies and best practices	All	The ROBIN toolbox equips regions with practical, ready-to-use tools to develop their bioeconomy strategies by for example developing a policy monitoring system or drafting environmental protection plans. It streamlines the process, making it efficient and effective.	Robin project	https://robintoolbox.web.auth.gr/index.php/good-practices/

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Name	Type	Bioeconomy Maturity level	Short description	Project / Initiative	Links
The Policy Monitoring System	Indicators and metrics	Developing; Mature	A tool to evaluate the performance of governance models with respect to Environmental, Socioeconomic and Governance (ESG) as well as territorial RRI aspects.	Robin project	https://robintoolbox.web.auth.gr/index.php/policy-monitoring-system/
The Regional Governance Models	Case studies and best practices	Emerging; Developing	A resource that provides a collection of diverse circular bioeconomy governance models designed for regional implementation across the EU. It considers varying typology aspects such as governance mechanism and constraints, territorial aspects, sustainability objectives among others.	Robin project	https://robintoolbox.web.auth.gr/index.php/governance-models/
The Rural toolkit	Financing tools	All	The Rural toolkit is the go-to guide to EU funding and support opportunities for rural areas in the European Union. It aims to help local authorities, institutions and stakeholders, businesses and individuals to identify and take advantage of existing EU funds, programmes and other funding and support initiatives, and to foster development in rural territories.	Directorate -General for Regional and Urban Policy	https://funding.rural-vision.europa.eu/?lng=en
The Support Actions Portfolio List	Guides and methodologies	Emerging; Developing	A tool with a collection of material and examples for action plans to support regional capacity building, in areas such as raising stakeholder awareness and engagement.	Robin project	https://robintoolbox.web.auth.gr/index.php/support-actions/

5 Conclusions and next steps

This comprehensive evaluation of digital tools for bioeconomy development has yielded valuable insights into the current landscape of resources available to regional stakeholders. Through our systematic methodology, we identified numerous tools across 21 bioeconomy initiatives. However, the assessment revealed several challenges that limited the inclusion of many tools in the final database.

A significant proportion of the identified tools were found to be outdated or no longer functional, particularly those developed under projects that have since concluded. This highlights a common sustainability issue with digital resources created through fixed-term projects. Without dedicated long-term maintenance, these potentially valuable tools become inaccessible to stakeholders who could benefit from them.

Additionally, many tools failed to meet our selection criteria related to usability, accessibility, and relevance. These limitations would likely impede their effective utilisation by regional bioeconomy stakeholders, making them suboptimal for inclusion in the primary database. Nevertheless, these tools still contain valuable information and may serve specific purposes or user groups

To maximise the impact of this research, the following next steps will be implemented:

- **Website integration:** The database of selected tools will be uploaded to the BIO2REG project website, providing easy access for all interested stakeholders. This will include a user-friendly interface that allows filtering and searching based on specific needs and interests.
- **Network hub expansion:** The curated database will also be integrated into the BIO2REG network hub, enhancing its functionality as a central resource for bioeconomy stakeholders. Importantly, tools that did not fully meet the selection criteria but still offer potentially valuable content will be included in a separate resources/tools section of the network hub, ensuring that all relevant materials remain accessible to interested users.
- **Dissemination Activities:** A targeted dissemination strategy will be implemented to promote awareness of the database among key stakeholder groups. This will include social media campaigns, presentations at relevant events, and direct communication with bioeconomy networks and initiatives.

Anexo 1: Bioeconomy initiatives identified

Project Name	Services	Website	Status	Starting date	Project website Active	Network hub	Active platform
BE-Rural	Initiative establishing Open Innovation Platforms in five Eastern European countries; Assesses regional biomass potential; Engages citizens through interactive formats; Develops regional bioeconomy strategies with local stakeholders; Builds on previous H2020 project experiences; No online network hub	https://be-rural.eu/	Completed - Operational	2020	Yes	No	
BIOEAST Initiative	Macro-regional initiative focused on developing cross-sectorial bioeconomy strategies for Central and Eastern Europe; Establishes multi-stakeholder networks; Identifies common research challenges; Provides evidence-based policy support; Improves skills through training; Develops funding synergies; Increases visibility of regional bioeconomy potential; No online network hub	https://bioeast.eu/	Renewed/New Phase	2024	Yes	No	
BIOinSouth	Multi-actor regional groups (MARGs) involving quadruple helix stakeholders; Regional HUBs in eight Southern European regions; Integrated toolkit for environmental impact assessment; Regional monitoring system for bioeconomy sectors; Policy recommendations for sustainability in industrial bio-based systems	https://bioinsouth.eu/	Starting	2024			
Biomodels4Regions	Initiative supporting innovative regional governance models for better-informed decision-making; Builds on bioeconomy clusters and previous best practices; Demonstrates results in 6 pilot regions	https://biomodel4regions.eu/	In progress/Ongoing	2022	Yes	Yes	No
BioMonitor	Bioeconomy monitoring and data collection initiative; Data-sharing platform for bioeconomy indicators; Community of statistical experts and policymakers; No online network hub	https://biomonitor.eu/	Completed - Operational	2018	Yes	No	
BioRegio	Initiative promoting circular economy of biological streams; Focuses on improving knowledge, increasing recycling rates and sharing expertise; Activities include policy development, best practices identification and stakeholder meetings; No online network hub	https://projects2014-2020.interregeurope.eu/bioregio/	Completed - Operational	2017	Yes	No	

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Project Name	Services	Website	Status	Starting date	Project website Active	Network hub	Active platform
Bioregions	Collaborative initiative for regional forest-based bioeconomy development; Support for policy learning through webinars and study tours; Catalysation of bioeconomy business through matchmaking and strategic partnerships; Activities to improve understanding of bioeconomy and strengthen societal engagement	https://bioregions.efi.int/	Established/Mature	2020			
BioRural	Initiative centered on three pillars (Knowledge, Network, Business Models) feeding into a publicly available BioRural Toolkit; Includes information gap analysis and knowledge exchange; Establishes 4 regional Rural Bioeconomy Platforms; Collects circular success stories; Develops business model blueprints; Offers capacity building through regional workshops	https://biorural.eu/	In progress/Ongoing	2022	Yes	Yes	
Biotransform	Framework and knowledge base for policymakers; Focus on accelerating transition from linear fossil-based systems to circular bio-based systems; Development of tools for setting informed priorities aligned with environmental, economic and social goals; Support for policy decisions that align with supply-and-demand trends in related industries and value chains; No online network hub	https://www.biotransform-project.eu/	In progress/Ongoing	2022	Yes	No	
BioVoices	Initiative to increase quality, relevance and social acceptability of bio-based products; Creates a Mobilisation and Mutual Learning (MML) platform; Develops stakeholder-oriented actionable knowledge; Raises citizen awareness; Supports co-creation among quadruple helix stakeholders (civil society/users, industry, researchers, public authorities)	https://biovoices.eu/	Completed - Operational	2018	Yes	Yes	No
CEE2ACT	Initiative supporting national bioeconomy strategies in 10 Central and Eastern European countries; Establishing National Bioeconomy Hubs; Facilitating knowledge exchange; Building stakeholder capacities; Providing digital solutions for green transition; No online network hub	https://www.cee2act.eu/	In progress/Ongoing	2022	Yes		

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Project Name	Services	Website	Status	Starting date	Project website Active	Network hub	Active platform
European Bioeconomy Network (EuBioNet)	Alliance of 160 EU-funded projects and initiatives focused on bioeconomy promotion; Maximises knowledge sharing, networking and coordination of joint activities; Increases awareness of sustainable circular bioeconomy; Stimulates debate and mutual learning; Identifies impact-oriented strategies; Facilitates stakeholder networking; Works in close collaboration with European Commission and CBE JU; No online network hub	https://eubionet.eu/	Established/Mature	2018	Yes	No	
MainstreamBio	Initiative offering catalogues of small-scale bio-based technologies and business models; Best practices for nutrient recycling; Decision Support System for biomass utilization; Bioeconomy Repository with educational materials; BioForum for stakeholder exchange; Guidance on sustainability schemes	https://mainstreambio-project.eu/	In progress/Ongoing	2022	Yes	Yes	
Power4Bio	Initiative to increase capacity of regional and local policy makers to structure their bioeconomy; Focuses on knowledge and best practice exchange within and among regions; Fosters mutual learning and collaboration among regional stakeholders; Supports development of sustainable bioeconomy value chains within 10 participant regions (including 5 from Central and Eastern Europe) from 9 countries; No online network hub	https://power4bio.eu/	Completed - Operational	2018	Yes	No	
ROBIN	Initiative focused on bioeconomy governance practices; Enhancing understanding of bioeconomy benefits among all stakeholders; Improving regional governance models with increased stakeholder engagement; Supporting better informed bioeconomy strategies for investment in sustainable business opportunities; Working to improve environmental footprint of bio-based products; Increasing cross-regional coordination under the CCRI to address Sustainable Development Goals; No online network hub	https://robin-project.eu/	In progress/Ongoing	2022	Yes	No	
RuralBioUp	Initiative supporting innovators to scale-up inclusive and small-scale biobased solutions in rural areas; Establishment of 9 regional hubs (multi-actor centres) in 6 EU countries; Implementation of 9 Action Plans on 18 value chains; Support for at least 1,000 innovators; No online network hub	https://www.ruralbioup.eu/	In progress/Ongoing	2023	Yes	No	

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Project Name	Services	Website	Status	Starting date	Project website Active	Network hub	Active platform
ScaleUp	Initiative to help regional actors overcome bottlenecks towards fully exploiting bioeconomy potentials; Focus on increasing capacity of multi-actor partnerships to accelerate marketable bio-based solutions; Improving knowledge about nutrient recycling potential; Deploying existing practical and scientific knowledge; Raising awareness of bioeconomy potential among local communities; Strengthening collaboration between stakeholders; Promoting regional transitions towards sustainable, regenerative, inclusive and just circular bioeconomy; No online network hub	https://www.scaleup-bioeconomy.eu/es/inicio/	In progress/Ongoing	2022	Yes	No	
Shaping Bio	Initiative to improve information basis about bioeconomy activities and best practices; Focus on enabling cross-sectoral and cross-governmental exchange; Aims to provide better understanding of the bioeconomy innovation ecosystem; Working to reduce fragmentation in the bioeconomy landscape; Contributing to better governance and improved exploitation of bioeconomy potential; No online network hub	https://www.shapingbio.eu/	In progress/Ongoing	2022	Yes	No	
Sustrack	Supports policymakers in developing sustainable pathways to replace fossil and carbon-intensive systems with sustainable circular biobased systems; Provides knowledge and tools for monitoring and assessing environmental, social and economic impacts; Focuses on identifying priorities and defining actions to support policy makers; Considers EU, regional and cross-territorial value chains in promoting sustainable transition; No online network hub	https://sustrack.eu/	In progress/Ongoing	2022	Yes	No	Yes
Transition2Bio	Initiative focused on communication, education and stakeholder engagement for bioeconomy; Awareness raising and education activities; Community building across diverse stakeholder groups; No online network hub	https://www.transition2bio.eu	Completed - Operational	2021	Yes	No	
ICT-BIOCHAIN	Digital innovation platform for bioeconomy supply chains; Connecting biomass suppliers with processors; Focus on Industry 4.0 technologies for bioeconomy	https://ictbiochain.eu/	Completed - Non Operational		No		

Anexo 2: Evaluation rubric for bioeconomy digital tools

Score	Usability	Accessibility	Relevance	Interactivity
1 - Poor	<ul style="list-style-type: none"> • Complex and confusing interface • Requires advanced technical knowledge • Inadequate documentation or tutorials • Long and complicated processes for basic tasks 	<ul style="list-style-type: none"> • Restricted access or paid membership only • Not available in different languages • Not optimised for different devices • No considerations for users with disabilities 	<ul style="list-style-type: none"> • Little focus on specific regional bioeconomy needs • Outdated data or information • Limited practical applicability • Not adapted to European or regional context 	<ul style="list-style-type: none"> • Static information presentation format • No customisation capabilities • Does not allow dynamic analysis or simulations • No collaborative functionalities
2 - Acceptable	<ul style="list-style-type: none"> • Functional interface but with some navigation issues • Requires some learning curve • Basic documentation available but incomplete • Some common tasks are complicated 	<ul style="list-style-type: none"> • Requires registration but is free or has trial version • Available only in English or few languages • Works on computers but not optimised for mobile • Minimal compliance with accessibility standards 	<ul style="list-style-type: none"> • Addresses general aspects of bioeconomy • Relatively updated information • Theoretical applicability but requires adaptation • Partially relevant for the European context 	<ul style="list-style-type: none"> • Some basic interactive elements • Limited customisation options • Basic data visualisation capabilities • Minimal collaborative functionalities
3 - Good	<ul style="list-style-type: none"> • Clear and relatively intuitive interface • Accessible to users with medium technical knowledge • Good documentation and some tutorials available • Most functions are easy to use 	<ul style="list-style-type: none"> • Open access with some premium features • Available in several main languages • Adapted to different devices • Complies with most accessibility standards 	<ul style="list-style-type: none"> • Focused on specific aspects of regional bioeconomy • Recent data and information • Direct applicability in some contexts • Adapted to the European bioeconomy framework 	<ul style="list-style-type: none"> • Multiple interactive elements • Good customisation options • Dynamic visualisations and some simulations • Adequate collaborative tools
4 - Excellent	<ul style="list-style-type: none"> • Highly intuitive and user-friendly interface • Accessible to non-technical users • Complete documentation, tutorials and assistance available • User-centred design with optimised processes 	<ul style="list-style-type: none"> • Completely open and free • Multilingual with regional adaptation • Fully responsive on any device • Meets all accessibility standards (WCAG 2.1) 	<ul style="list-style-type: none"> • Fully oriented to regional bioeconomy needs • Constantly updated information • High direct practical applicability • Specifically designed for the European context and adaptable to specific regions 	<ul style="list-style-type: none"> • Highly interactive with real-time response • Complete customisation according to user needs • Advanced simulations and customisable scenarios • Extensive collaborative and co-creation capabilities

Source: own elaboration