



# BIOBASEDCERT

## BIOBASEDCERT Monitoring Tool (BMT)

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Joint Deliverable for HORIZON–CL6-2021-ZEROPOLLUTION-01-07

This report is an output of the joint work of HARMONITOR, STAR4BBS and SUSTCERT4BIOBASED.

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## List of Acronyms

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EC	European Commission
EUBCE	European Biomass Conference & Exhibition
BMT	BIOBASEDCERT Monitoring Tool
CSLs	Certification schemes and labels
EU	European Union
FSC	Forest Stewardship Council
GHG	Greenhouse Gas
ISCC	International Sustainability & Carbon Certification
RED	Renewable Energy Directive
RSB	Roundtable on Sustainable Biomaterials
RSPO	Roundtable on Sustainable Palm Oil
SBP	Sustainable Biomass Program
SDGs	Sustainable Development Goals

# Executive summary

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This deliverable reports on the final version of the BIOBASEDCERT Monitoring Tool (BMT) that has been developed jointly by the BIOBASEDCERT cluster (comprised of the SUSTCERT4BIOBASED, STAR4BBS and HARMONITOR projects) to assess the robustness, comprehensiveness and effectiveness of existing voluntary sustainability certification schemes and labels (CSLs) for industrial biobased systems (where food/feed, biofuels, bioenergy, and cultural/recreation sector are excluded).

BMT is structured in three levels:

- The system level focuses on system characteristics, including governance, traceability, and assurance. This level provides an assessment of robustness of CSLs.
- The content level focuses on the sustainability requirements of the CSLs. This level provides an assessment of the comprehensiveness of the CSLs.
- The outcome level focuses on evidence of the performance and impact generated by the implementation of CSLs. This level provides an assessment of effectiveness of the schemes.

This deliverable presents the three levels and their requirements, as well as on the development process of each level and their requirements. The BMT was developed following two rounds of testing on CSLs and implementing improvements based on the feedback collected during testing and engagement with CSL owners and policy makers. The resulting BMT is a simple spreadsheet incorporating the three levels which can be found as an annex to this deliverable. The guidance notes on using this tool are also provided in this deliverable. The intention is not to compare the CSLs, but to conduct individual assessments and identify opportunities for each of the CSL owners to enhance the ambition level of their schemes. This can drive a voluntary process of improvement so that CSLs can more effectively contribute to a sustainable transition to biobased economy.

# 1. Introduction

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## 1.1. Introduction to the BIOBASEDCERT Monitoring Tool (BMT)

The projects selected under the call “ZEROPOLLUTION-01-07: International and EU sustainability certification schemes for bio-based systems” include STAR4BBS (Sustainability Transition Assessment Rules for Bio-Based Systems), HARMONITOR (Harmonisation and monitoring platform for certification schemes and labels to advance the sustainability of bio-based systems), and SUSTCERT4BIOBASED (Sustainability Certification for Biobased Systems). These three sister projects have formed a project cluster named BIOBASEDCERT.

Several international and EU sustainability standards have been developed and are applied for biological resources and biobased products through voluntary certification schemes and labels. They serve as powerful instruments to ensure the sustainability of bio-based products. However, the rapid proliferation of sustainability certification schemes and labels (CSLs) has created confusion among stakeholders and led to questioning their credibility. It is important that there are ways to test to performance of these existing CSLs. This is where BIOBASEDCERT comes into play.

Central to our efforts under BIOBASEDCERT was the development of a monitoring system to assess the robustness, comprehensiveness and effectiveness of sustainability certification schemes and labels (CSLs) for biobased products and biological resources intended for industrial biobased value chains. The goal of this deliverable is to report on the final version of the BIOBASEDCERT Monitoring Tool (BMT) that has been developed by the cluster. It was decided to develop the monitoring system jointly by the three sister projects to establish a harmonized, overarching system for assessing CSLs and therefore reduce confusion, divergences, and mistrust among stakeholders that uncoordinated efforts of the three projects could have caused. By working together on the BMT, the sister projects were able to streamline stakeholder consultations and avoid duplication of efforts.

The BMT has been developed to assess the robustness, comprehensiveness and effectiveness of international and EU sustainability certification schemes and labels, applicable to industrial biobased systems. It has two target stakeholder groups: policymakers and CSL owners. For policymakers, the BMT aims to provide a framework to evaluate the potential of CSLs and accompanying standards to contribute to the objectives



and sustainability goals prioritised in relevant EU policies and Sustainable Development Goals (SDGs). For CSL owners, the BMT supports and incentivizes them to improve their systems by identifying potential areas for improvement. The BMT could also facilitate the harmonisation of CSLs in terms of shared sustainability and governance criteria.

The BMT is designed to evaluate CSLs applicable to industrial biobased value chains. Within this framework, industrial biobased systems specifically exclude food/feed, biofuels, bioenergy, and the cultural/recreational sector. The framework considers the entire value chain, covering each main stage of the value chain separately and capturing all aspects of a product's life cycle. While the BMT focuses on products traded within the EU, the evaluation of complete value chains for biobased products will extend to other geographical regions involved in their production and processing, including the production of feedstock and all upstream and downstream operations within the supply chain.

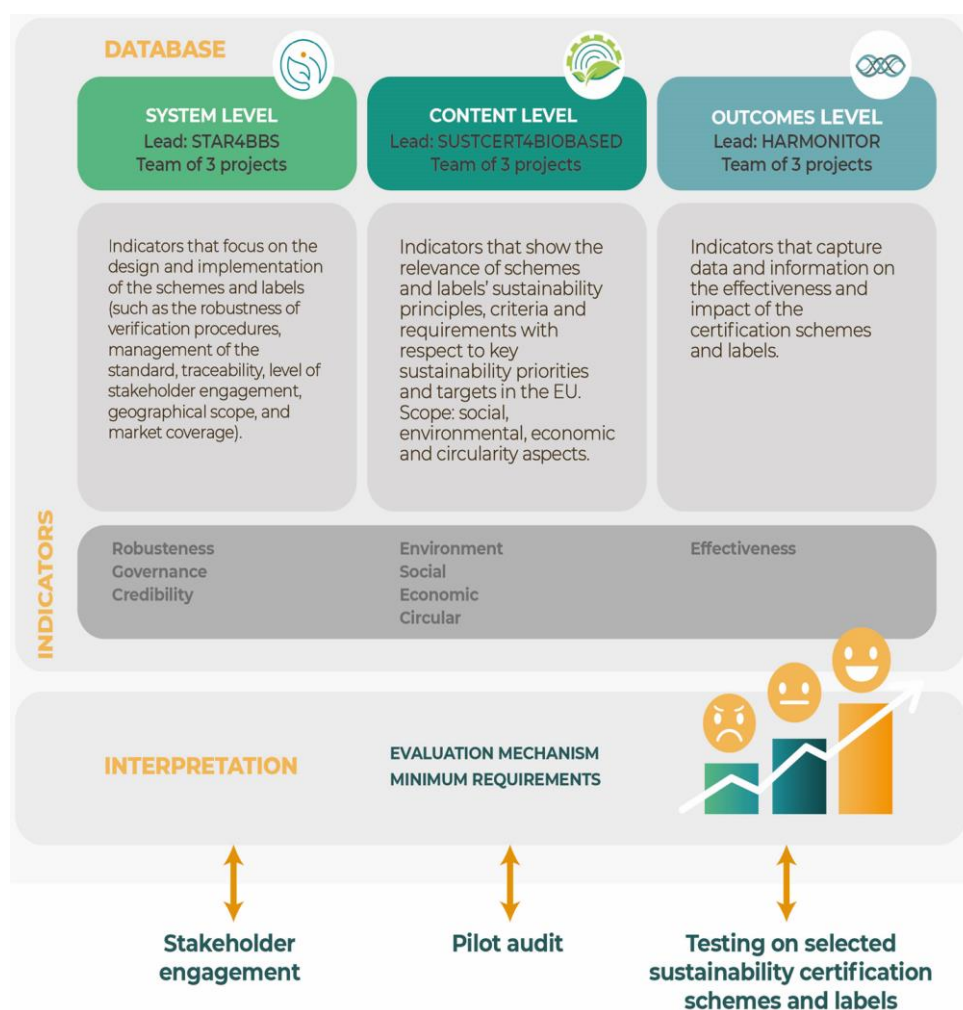


Figure 1. BIOBASEDCERT Monitoring Tool (BMT)

The monitoring system is built around a comprehensive set of requirements designed to gather crucial information on CSLs. These requirements are structured into three levels (Figure 1):

- System Level – Assessing the governance, transparency and operational robustness of CSLs.
- Content Level – Evaluating the sustainability and circularity requirements set by the standards for certified operators.
- Outcome Level – Measuring the impacts generated by the implementation of CSLs.

This multi-level approach provides a holistic framework for assessing and enhancing the role of certification schemes in supporting the biobased economy.

Each of the three projects oversees the development of one of the three levels (see Figure 1), aligning and coordinating inputs from each project. This approach allows technical knowledge and expertise that can be synergized and built upon.

## 1.2. Relation to other activities and deliverables of the cluster

This deliverable on the BMT is a joint deliverable of the three projects. The cluster has several joint deliverables on the clustering activities, such as this one, and policy briefs. Additionally, each project has individual deliverables related to the development and testing of the BMT levels they lead. These include:

- System level (STAR4BBS)
  - D1.4 Report on existing monitoring schemes, with recommendations for new system
  - D3.2 Report on additional indicators of monitoring system
  - D3.3 Report on metrics thresholds and minimum requirements
  - D4.1 Concept of the monitoring system
  - D4.3 Report on the testing and ranking (final system level testing results)
- Content level (SUSTCERT4BIOBASED)
  - D1.2 Catalogue of sustainability certification schemes and labels
  - D3.1 Review of existing monitoring approaches for schemes and labels
  - D3.2 Evaluation of existing schemes and labels (final content level testing results)
- Outcome level (HARMONITOR)
  - D5.1 Draft Monitoring System
  - D5.2 Monitoring system test results

Note: While the results from outcome level testing were reported in D5.2 which was submitted in February 2025, the updated results are included in Annex B in this deliverable.

### 1.3. Structure of the document

This deliverable is structured as follows:

- Chapter 2 provides information on the general methodology applied in the development and testing of the BMT as well as on the stakeholder engagement carried out for its improvement
- Chapter 3 presents the three different levels of the BMT providing information on how they were developed, the different sections, principles, criteria and requirements included in each level, and the evaluation mechanism applied.
- Chapter 4 provides guidance notes for using the BMT. The BMT is an Excel tool which is included as Annex to this deliverable.
- Chapter 5 draws conclusions and reports key highlights from the BMT and its development.

## 2. Methodology

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### 2.1. Methodology applied in development and testing of the BMT

Instead of developing project-specific monitoring systems, which were originally planned according to the initial grant agreement of the individual projects, it was decided to join forces with the sister projects from the start of the projects. The motivation of joining forces with the sister projects was to create a harmonised, overarching system and to increase the chances of continued use of the BMT after the end of three projects. Working together allows the projects to build on each other's knowledge and experience, subjecting the BMT to a higher level of scrutiny and maximising the effective use of resources.

The sister projects wrote a collaborative proposal for the development of a joint monitoring tool that was submitted in January 2023 to the EU officials. This proposal presented i) the benefits of the existence of the BMT; ii) the purpose, audience, and scope of the BMT; iii) proposed structure of the BMT; iv) a description of the specific focus of each project; and v) time planning, resources management. This proposal was accepted in June 2023 and the collaborative efforts intensified. Inter-project teams were formed for each of the three BMT levels, and recurring core meetings where all three level groups came together were held.

The target audience, purpose and scope of the BMT are described as follows:

#### *Purpose of the BMT*

The BMT has been developed to assess the robustness, comprehensiveness and effectiveness of international and EU sustainability certification schemes and labels applicable to industrial biobased systems.

#### *Audience of the BMT*

BMT has two target stakeholder groups: policymakers and CSL owners. For policymakers, the BMT aims to provide a framework to evaluate the potential of CSLs and accompanying standards to contribute to the objectives and sustainability goals prioritised in relevant EU policies and Sustainable Development Goals (SDGs). For CSL owners, the BMT supports and incentivizes them to improve their systems by identifying potential areas for improvement.

*Scope of the BMT*

The BMT is developed for analysing CSLs for biological resources intended for industrial biobased value chains and for biobased materials and products. CSLs specific to solely food/feed, biofuels, bioenergy, and cultural/recreation sector are excluded, as are CSLs that focus on only one sustainability aspect (e.g., GHG emissions). The BMT considers the entire value chain, aiming to capture all aspects of a product's life cycle. While the BMT is applicable to products traded within the EU, the evaluation of entire value chains of biobased products cover other geographical regions involved in the production and handling of the products (i.e., production of feedstock and all upstream and downstream operations within the supply chain).

The structure of the BMT and the specific focus of each project in developing the BMT are as follows:

*Structure of the BMT and division of work between sister projects*

The BMT is structured into three levels: system, content, and outcome (see Figure 1). The *system level* focuses on system characteristics, including governance, traceability, and assurance. This level provides an assessment of robustness of schemes. The *content level* focuses on the sustainability requirements of the CSLs. This level provides an assessment of the comprehensiveness of the CSLs. The *outcome level* focuses on evidence of the performance and impact generated by the implementation of CSLs. This level provides an assessment of effectiveness of the schemes.

To systematically collect the inputs from the three projects in a strategic manner, it was considered important to have each project coordinate one level. Thus, the cluster proposed an allocation of the coordination roles based on the strengths of each project and the partners involved. STAR4BBS led the development of the system level, supported by the knowledge and practical experience of project partner ISEAL in defining the credibility in sustainability systems. SUSTCERT4BIOBASED led the content level, with project partners WR as a research organisation with strong background in assessing sustainability and circularity of biobased products and ECOS as an environmental protection organisation. HARMONITOR led the outcome level with UU as an academic organisation to tackle the assessment of the effectiveness of CSLs. This is the least explored area in research and as such allows for methodological development and venturing beyond conventional methods. While each level was led by one of the sister projects, each was supported by the other two projects. The three projects also worked jointly on the definition of evaluation mechanism.

### *Timeline for BMT development and testing*

The timeline of the development of the BMT and the testing process is depicted in Figure 2. The development of the draft BMT took place between June 2023 until February 2024. This was done in close collaboration between the sister projects. Stakeholder input was collected during EUBCE 2023 side event in Bologna. In December 2023 an online co-creation event was organised to get input and feedback for BMT development. This was followed by a survey focused on minimum requirements and results visualisation. After the event, a survey was sent to targeted stakeholders concerning the different levels of the BMT to collect further feedback. The feedback received was integrated into the draft BMT and this was ready for testing in February 2024.

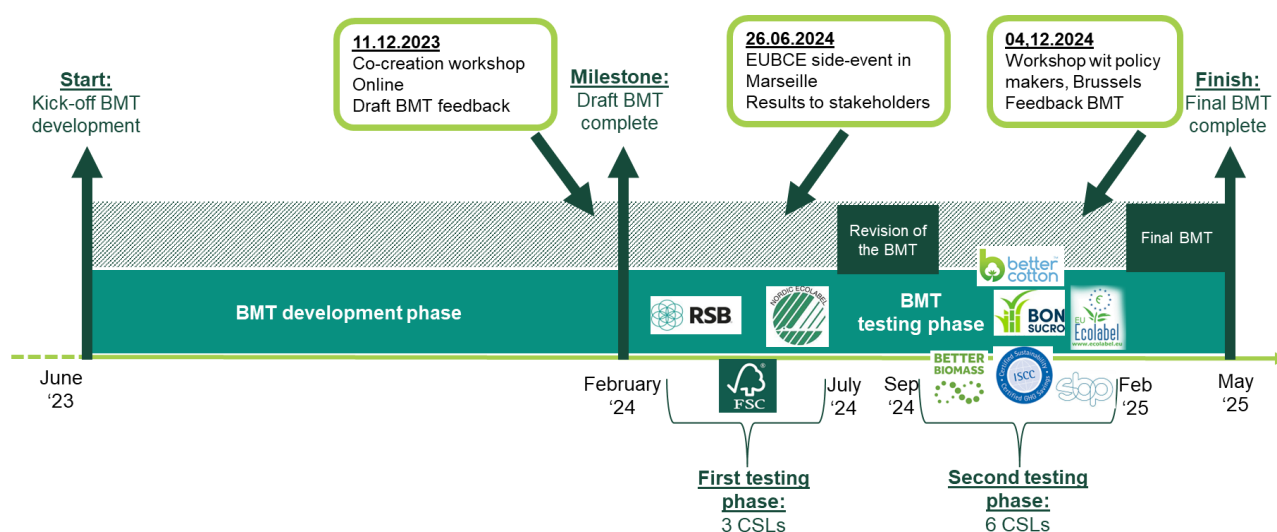


Figure 2. Timeline and activities around the BMT development and testing process

The testing was carried out in two phases. The first testing phase commenced in February 2024 and was completed in July 2024. The second testing phase started in September 2024 and was completed in February 2025. Table 1 provides an overview of the selected CSLs for testing in the first and second testing phase. The intention was that this selection of CSLs covered the most relevant and prominent CSLs and a broad range of sectors in the biobased industry. After completion of the two testing phases, a final revision phase of the assessment results took place from February until April 2025 incorporating the additional insights and feedback received.

Table 1. Selected CSLs for testing in first and second testing phase

Selected CSLs	Involvement in testing phase
RSB	First
FSC	First
Nordic Swan Ecolabel	First
Better Biomass	Second
ISCC	Second
Better Cotton	Second
Bonsucro	Second
SBP	Second
EU Ecolabel	Second

### 2.1.1. Testing of the CSLs engaging with CSL owners and incorporation of feedback

The selected nine CSLs were tested in close collaboration with CSL representatives. An iterative approach was used, whereby two testing phases were conducted, each followed by revision of the BMT based on the generated feedback. Throughout the process, the BMT was continuously subjected to review and feedback by the cluster and stakeholders to drive its improvement towards its final version.

Both testing phases commenced with an official online kick-off meeting. During these online sessions, representatives from the CSLs to be tested in that phase were introduced to the cluster, the BMT and its three levels. Subsequently, the sister projects laid out their expectations regarding collaboration with the CSLs, and the CSL representatives had the chance to ask questions, voice concerns and bring in suggestions.

After the kick-off meetings (which took place in February 2024 and September 2024 for the first and second testing round, respectively), the testing commenced and regular contact was maintained with the CSL owners. At the beginning of the testing phase, important contact moments revolved around scope definition and the identification of relevant scheme and label documents for review (step 1).

For the content and system level, the method was slightly modified after the first testing phase with the addition of step 0 (see Figure 3). In this step, the CSL owners were asked to fill in a pre-assessment questionnaire (i.e., scope-defining exercise) on the coverage of their CSL to provide a better understanding of their respective scopes and thus ease the testing process.

For the outcome level, in-depth interviews with participating CSL owners were integrated as a critical component of the testing methodology on both testing rounds. The primary objective was to assess the methodology's applicability and feasibility by eliciting CSL owners' perspectives on impact definitions, existing monitoring frameworks, and mechanisms for continuous improvement at the certificate holder level. Discussions focused on the extent to which each CSL can track progress at this level. In the second testing round, the interview scope was expanded to include topics, among others, baselines used for impact measurement, sufficiency of available data to demonstrate progress, and monitoring outcomes in the context of one-way or mutual recognition between CSLs.

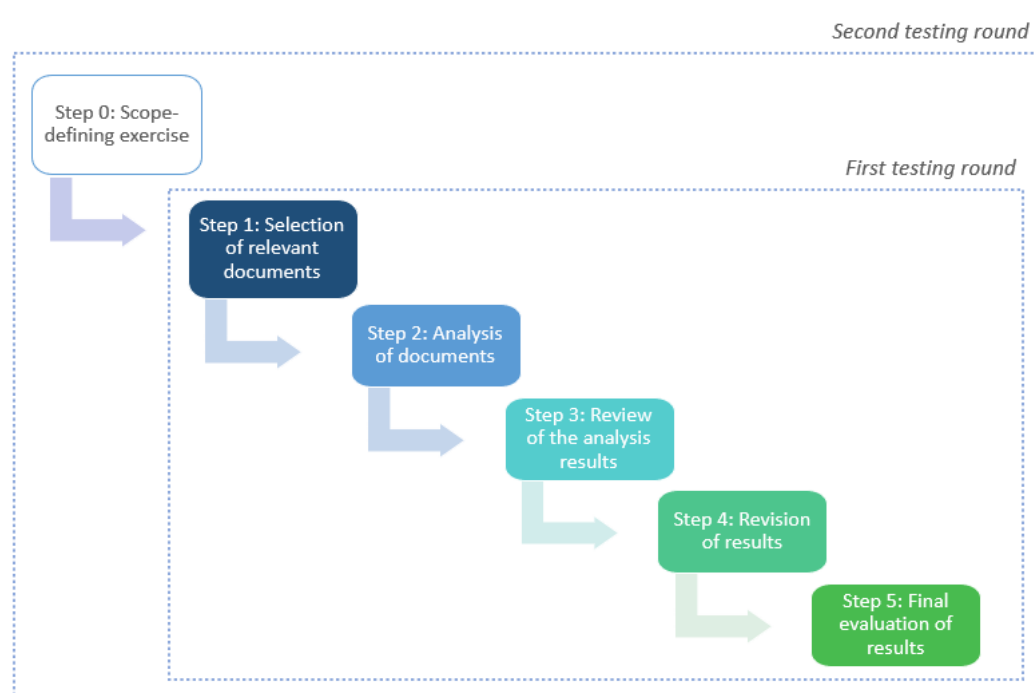


Figure 3. Stepwise method to testing BMT, with the addition of step 0 in the second testing round

After the initial analysis of the documents was carried out (step 2), preliminary results were shared with each respective CSL representative for their review (step 3). Subsequently, one-to-one sessions were scheduled to check with CSL owners on some requirements where it was difficult to find evidence in their standards, discuss the initial findings, and respond to questions from CSL owners. The obtained feedback was integrated into the assessment results, resulting in the final version of the assessment results (step 4). The final assessment result version was shared with each scheme or label owner for a final review and confirmation (step 5).



Closing workshops took place in May 2024 for the first and in January 2025 for the second testing round. During these workshops, the preliminary testing results were presented, and additional feedback was obtained from the CSL owners. After the second closing workshop, the assessment results from all tested CSLs were revised based on the final version of the BMT and the feedback provided by the involved CSL owners. Subsequently, the final draft results were shared with each respective CSL owner, allowing them the opportunity to provide feedback in April 2025.

### 2.1.2. Stakeholder engagement

Besides the specific engagements with the owners of the tested CSLs as outline above, additional stakeholder engagements were carried out to collect feedback for the BMT development and disseminate the findings. This includes the BIOBASEDCERT platform meetings, side events organized by the cluster at European Biomass Conference & Exhibition (EUBCE) in 2023 and 2024 and additional physical and online co-creation workshops. An overview of these engagements is provided in Table 2.

Table 2. Overview of stakeholder engagements

No	Title of the workshop	Short description	Date
1	Sustainability Certification of Biobased Products   Parallel event at EUBCE 2023	Side event organised as part of EUBCE where input for BMT development was collected.	07.06.2023
2	Robust and Effective Sustainability Certification for Bio-based Systems - BIOBASEDCERT cluster online co-creation workshop	Presented the latest developments and intermediate results of the BMT and gathered feedback from various stakeholders.	11.12.2023
3	Monitoring sustainability certification schemes and labels for bio-based products   Parallel event at EUBCE 2024	Side event organised as part of EUBCE where the draft BMT was presented and feedback was collected from various stakeholders.	26.06.2024
4	1st BIOBASEDCERT Roundtable Meeting, online	1st Roundtable meeting with representatives from CSL owners	12.07.2024
5	2nd BIOBASEDCERT Roundtable Meeting, online	2nd Roundtable meeting with representatives from CSL owners	27.09.2024
6	3rd BIOBASEDCERT Roundtable Meeting & BIOBASEDCERT Workshop on BMT, Brussels	3rd Roundtable with representatives from CSL owners combined with BIOBASEDCERT Workshop with Policy makers on the role of BMT	04.12.2024
7	4th BIOBASEDCERT Roundtable Meeting, online	4th Roundtable meeting with representatives from CSL owners	02.04.2025
8	BIOBASEDCERT Final Event, Brussels	Final event of the cluster where final version of the BMT and high level results from the testing are presented to stakeholders	13-14.05. 2025
9	5th BIOBASEDCERT Roundtable Meeting, online	5th Roundtable meeting with representatives from CSL owners	21.05.2025

## 3. Description of the BMT levels

### 3.1. System level

#### 3.1.1. Development process

The system level indicators are behind the operational systems of a certification scheme, and they include governance mechanisms and rules of the development process, among other elements. The robustness of a certification scheme and a certain level of assurance are a measure of its trustworthiness, and that certification criteria are indeed met.

During the development phase of the system level indicators, the cluster took a 6-step approach for their identification and selection (Figure 4).



Figure 4. Graphical representation of methodological approach for the system-level elements selection

For the identification of the system-level elements, in the review phase, a wide variety of sources was used (Figure 5). These included 19 existing monitoring tools, selected CSLs, academic literature, international guidelines, and regulatory frameworks. The second step included comparison between requirements of the three selected tools (ITC Standards Map, Siegelklarheit and GSSI). Then the ITC Standards Map was selected to benchmark all identified system-level elements against its requirements. The ITC was selected due to considering it as a prospective hosting platform for the BMT in the early process, but also because of tool's comprehensiveness, broad range of indicators, consistent updates and adherence to ISEAL's principles for credible benchmarking, making it a valuable choice for ensuring the relevance of the BMT.

General standards and guidelines	Policies and regulations	Certification standards	Monitoring tools and benchmarks
ISO/IEC 17020	Corporate Sustainability Reporting Directive (CSRD)	RSB	ITC Standards Map
ISO/IEC 17021	Green Claims Directive	Better Cotton	GSSI Global Benchmark Tool
ISO/IEC 17065	ESRS	FSC	FEFAC Responsible Soy Benchmarking Tool
ISO 13065	RED II	Global GAP	SME Compass
ISEAL Credibility Principles		Global GAP	FSI Basket of Standards
ISEAL's Sustainability Benchmarking Good Practice Guide		ISCC	Siegelklarheit
NEN-EN 16751		Green Button (Grüner Knopf)	SAFA tool
OECD Due Diligence Guidance (2018)			SSCI Benchmarking requirements tool
GFSI (2013) Guidance Document			SSCT
FAO Guidelines for the Ecolabelling of Fish and Fishery Products from Inland Capture Fisheries (2011)			WWF CAT tool
FAO Technical Guidelines for Responsible Fisheries (2011)			Comparative Matrix of Forest Certification Schemes (CEPI)
German Sustainability Code			STARProBio SCT (Sustainability Certification Tool)
			ADVANCEFUEL
			IDH SIFAV basket of standards
			OECD MNE Guidelines benchmarking
			Seafood Stewardship Index
			Blue Angel Comparison of Certification Systems
			Labelinfo.ch
			SOJA (Soja Netzwerk Schweiz)
			Textile Exchange Corporate Fiber & Materials Benchmark (CFMB) and the Material Change Index (MCI)

Figure 5. Overview of reviewed documents in the review phase of system-level development

The refinement or restructuring of the system-level elements spanned across different phases of the identification and selection process, as predicted at the very beginning of step-by-step approach implementation. The final categorization of the elements followed the co-creation workshop event, where, based on stakeholder consultation and feedback, final categories and principles selection was conducted.

During all previously mentioned process phases, consistency with existing ISO (e.g., ISO/IEC 17020, ISO/IEC 17021, ISO/IEC 17065) and national standards and guidelines (e.g., German Sustainability Code) and policies (e.g., Green Claim Directive) concerning system level indicators was checked, and the method included recurring checking after first draft of the requirements was prepared. In addition, selected elements were benchmarked against the ISEAL Credibility Principles.

As already mentioned, stakeholder participation and involvement were an important step in identification and selection of system-level elements, and both online and live events with pre-prepared validation exercises and surveys were used for the purpose of collecting feedback and input (namely, co-creation workshops).

### 3.1.2. Structure

The system level elements were categorized according to the classification structure depicted in Figure 6.

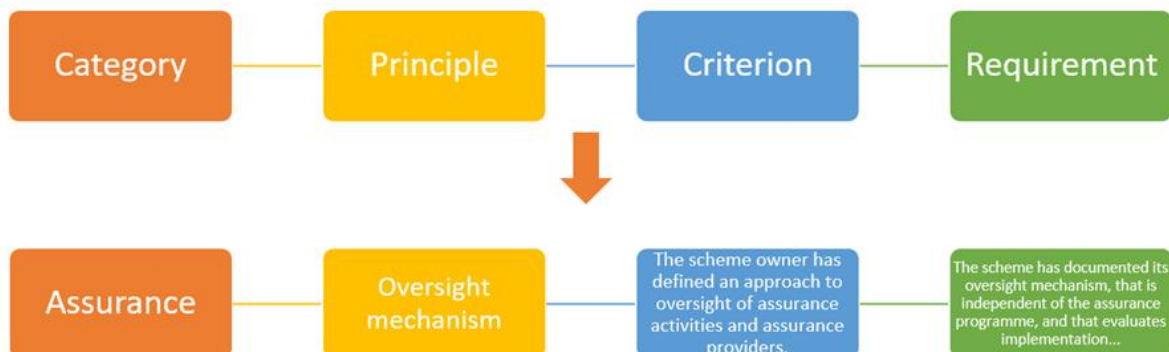


Figure 6. Classification of the system level elements

#### 3.1.2.1. Categories and principles

The operational requirements and set-up of the SCS and labels are shaped and driven by a diverse array of elements, including stakeholder expectations, market demand, the emergence of potential competitors, policy targets, and the dynamics of internal processes, among other factors. Among the existing key aspects of development process and system characteristics of a scheme, the four major categories from our analysis proved as the most reflective in terms of overall comprehensiveness and coverage of essential indicators.

The system level is organized into four distinct **categories**, each associated with overarching **principles**. These categories encompass the key areas of a certification system's governance and operations: Standard Setting, Assurance, Traceability and Claims, Governance and Scheme Management (Figure 7). Each of the four selected categories contains one or more principles, followed by corresponding one or more criteria and one requirement per criterion with guidance notes.

Standard Setting category focuses on the processes for developing and revising sustainability standards, emphasizing inclusivity, transparency, and responsiveness to emerging EU policies' needs. It ensures that standards remain relevant, locally adaptable, and broadly accepted. Assurance covers the mechanisms that verify compliance with standards, including third-party audits, accreditation systems, and impartial certification decisions. It ensures that certification decisions are reliable, consistent, and publicly accountable. Traceability and Claims address the transparency and tracking of product

flows and sustainability claims across the supply chain. This includes chain of custody verification, claims management, and labelling policies, which together prevent fraud, support informed consumer choices, and reinforce the credibility of sustainability claims. Finally, Governance and Scheme Management category refers to the governance framework and operational structures that uphold the integrity and impartiality of a certification scheme. It ensures transparent decision-making, stakeholder inclusiveness, and impartiality, fostering trust and accountability. Collectively, these categories represent the structural and procedural foundation needed to assess and benchmark the robustness of certification schemes and labels operating in bio-based value chains.

Category	Principle
Standard setting	Standards content
	Standard-setting process
	Standards consultation
Assurance	Assurance system
	Conformity assessment
	Conformity assessment bodies
	Auditing
	Oversight mechanism
Traceability and claims	Chain of Custody traceability system
	Claims and products labelling policy
	Consequences of misuse of claims
	Minimum percentage claims
Governance and Scheme management	Scheme scope and objectives
	Governance structure
	Stakeholder participation
	Due diligence
	Complaints and dispute resolution mechanism

Figure 7. Overview of BMT system level categories and principles

### 3.1.2.2. Criteria and requirements

As established in the earlier sections, each principle within the System Level of the BMT is operationalized through a defined set of **criteria**, each of which includes one or more specific **requirements**. While the principles represent high-level governance elements (e.g., assurance system, due diligence, or stakeholder participation), the criteria and associated requirements translate those elements into assessable and evidence-based elements that can be used to evaluate robustness of a certification scheme.

The criteria typically begin with phrases such as “The scheme has mechanisms to...” or “The scheme ensures that...”, and the requirements specify the practices and structures that should be present for the criteria to be considered met. For example, a criterion under

the Scheme Management category might state: *The scheme owner provides information on how the input received from stakeholder consultations has been included in the final version of the standard.* One of the corresponding requirements could be: *The scheme owner provides information on how the input received from stakeholder consultations has been included, making all comments received in a non-attributable way in the consultations publicly available (or at a minimum accurate summaries of these comments).*

The development of these requirements is grounded in comprehensive reviews of existing certification systems documentation, good practice guidance (e.g., ISEAL, ISO), and the operational structures of existing monitoring systems. They also draw from academic literature, compliance frameworks, and the growing policy environment on sustainable governance and traceability systems, particularly in the bio-based sector.

The complete list of System Level criteria and requirements is available in the **BMT Excel tool (Annex A)**, where they are categorized under the four core domains: Standard Setting, Assurance, Traceability and Claims, and Governance and Scheme Management.

An overview of the criteria topics can be seen in Table 3.

Table 3. Overview of the system-level criteria topics

Principle	Overview of criteria topics
<b>Standard Setting</b>	
Standards content	standard available free of charge; guidance on consistent standard interpretation
Standard-setting process	standard continually reviewed and revised; procedures for stakeholder engagement available
Standards consultation	public consultation rounds; openness of standards development; directly affected stakeholders' participation; balanced participation; adaptation or interpretation of the standard to regional contexts; received inputs publicly shown
<b>Assurance</b>	
Assurance system	description of the methodology; summary certification reports
Conformity assessment	minimum level of conformity assessment; handling non-conformities

Principle	Overview of criteria topics
Conformity assessment bodies	CABs compliance with ISO standards; list of all accredited/approved CABs; qualifications and competencies of CAB auditors; list of certified products/product;
Auditing	auditing methods; frequency of audit process; type of CABs activities; unscheduled audits; audit report formats
Oversight mechanism	documented oversight of assurance activities and providers; appeals mechanism
<b>Traceability and Claims</b>	
Chain of Custody (CoC) traceability system	documented CoC standard; traceability requirements; CoC audit; multi-site CoC certification; subcontractors' requirements; mixing certified and uncertified inputs; encouraging the increase of certified input; records keeping
Claims and products labelling policy	policies for products labelling and claims use; clear indication of application; explanatory text claim or link; unique license numbers or other tracking mechanisms; specified claims for different CoC models; percentage of certified/verified content
Consequences of misuse of claims	consequences of misuse of claims; surveillance of the accurate use of claims
Minimum percentage claims	minimum percentage of a certified/verified input in a single ingredient product; minimum percentage input claims for composite product
<b>Governance and Scheme Management</b>	
Scheme scope and objectives	scope of certification; sustainability-defined goals and objectives; smallholders' operations
Governance structure	legal status of scheme owner; organizational structure; economic independence; accountability of decision-making body members; income sources or financing structure
Stakeholder participation	formal input on the scheme governance; balanced stakeholder representation; under-represented stakeholder groups; affected stakeholders notified of changes
Due diligence	risk assessments and mitigation; due-diligence procedures
Complaints and dispute resolution	complaints mechanism and dispute resolution

### 3.1.3. Evaluation mechanism

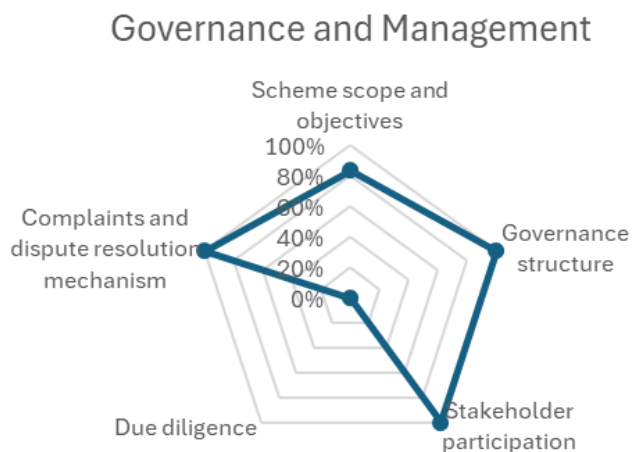
The assessment begins with a pre-assessment phase, where the scope and applicability of each principle are determined. This step filters out non-applicable content and tailors the evaluation to the specifics of each CSL.

In the main assessment phase, the assessor evaluates each applicable requirement and assigns a response (Yes/No/N.A.) with corresponding justifications (Figure 8). This process is facilitated by an Excel-based tool that automates parts of the workflow and enables systematic data entry. For each requirement, the assessor records whether it is met ("Yes"), not met ("No"), or not applicable ("N/A"). A "Justification" column is provided to support transparency and traceability, requiring the assessor to explain their reasoning and cite specific documents or practices from the CSL being assessed.

Response options	Scoring
Yes, fully	2
Yes, partially	1
No	0
Not Applicable	N/A

Figure 8. BMT System Level scoring

After the assessment is complete, the tool aggregates responses into a visualized scoring



output, namely spider diagram (

Figure 9), providing both high-level and detailed insights into the strengths and weaknesses of a CSL. This visual representation supports easier communication with stakeholders and allows for strategic discussions on improvement areas. Tables with percentages per principle are used as supporting elements (Figure 10).



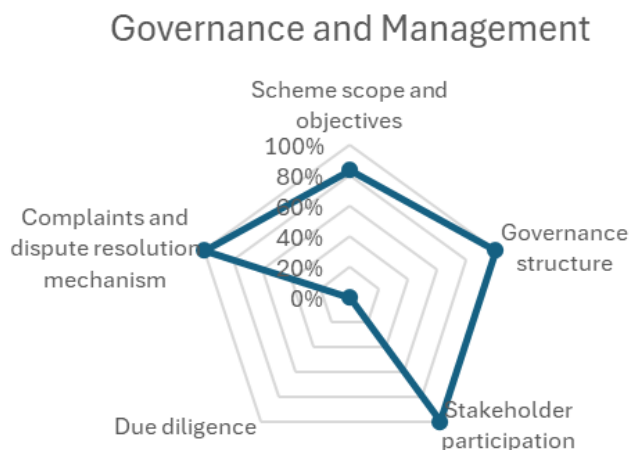


Figure 9. Spider diagram as an example of visual representation of system-level assessment result

<i>Governance and Management</i>	
Principle	Percentage of points received
Scheme scope and objectives	83%
Governance structure	100%
Stakeholder participation	100%
Due diligence	0%
Complaints and dispute resolution mechanism	100%

Figure 10. Example of a tabular representation of system-level assessment results

## 3.2. Content level

### 3.2.1. Development process

As described in section 1, the content level BMT assesses the comprehensiveness of CSLs and evaluates the sustainability requirements set out for operators seeking certification in the CSL's standards.

The development process of content level BMT is depicted in Figure 11.

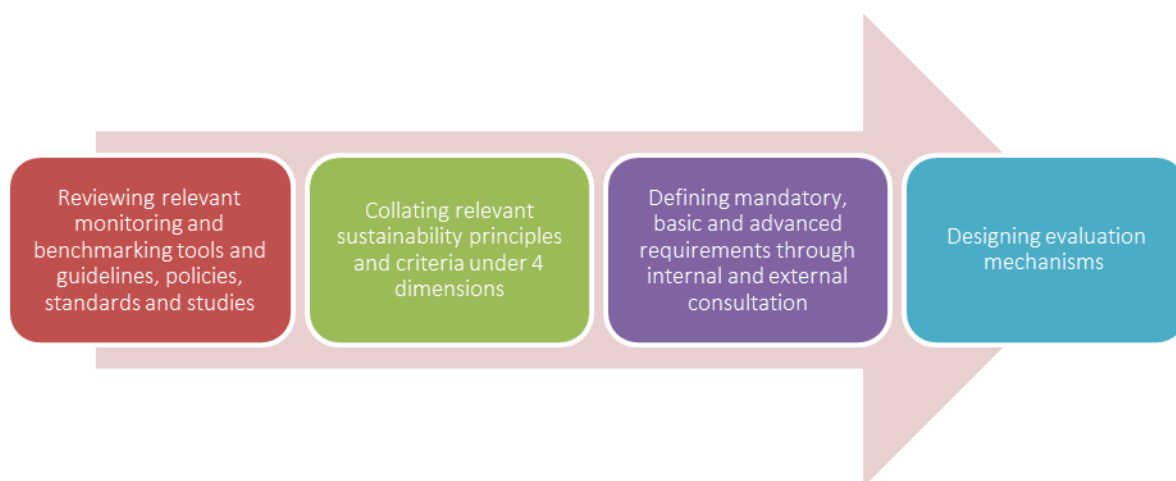


Figure 11. Content level BMT development process

Firstly, to identify the sustainability requirements applicable to biological resources and biobased materials and products, a thorough review of relevant legislation, monitoring and benchmarking tools, standards, guidelines and CSLs was carried out. In Figure 12, an overview is provided of the reviewed documents. The sustainability principles and criteria concerning environmental, circularity, social and economic themes contained in the standards of CSLs for biobased resources and products were assessed and collated. The collation of principles and criteria was also informed by a review of relevant legislation, standards, and previous studies focused on the sustainability of biobased products and the bioeconomy in general. This review was building on the previous and ongoing project results especially from SUSTCERT4BIOBASED D1.2, and also inputs from relevant work from STAR4BBS and HARMONITOR as depicted in Figure 12. The resulting collation of principles and criteria was accordingly made through a cross-project collaboration. Although the project is focused on industrial biobased systems, relevant sustainability standards for food and biofuels/energy were reviewed to utilize and build on the longer experience from these sectors. This review resulted in the identification of the key dimensions and associated principles that cover the topics considered relevant for the sustainability management of biobased resources and products, which is reflected in the structure and content of the BMT.

Monitoring tools and benchmarks	General standards and guidelines	Policies and regulations	Past project outputs
FAO SAFA Guidelines	The Accountability Framework Principles and guidance documents (Afi)	CSRD	CBE-JU study of the environmental sustainability requirements of biobased value chains and supply chains for bio-based industry
ITC Standards map	Cradle to Cradle	EU Regulation 2022/996 on ILUC	S2Biom D5.4
SSCI Benchmarking requirements tool	FAO Framework for environmental and social management 2022	EU Taxonomy	StarProbio D2.1, D8.2
SSCT by Siegelklarheit	HCV guidelines	EUDR	
WWF CAT tool	ILO Standards and Principles	ESRS	
Certification standards	ISEAL guidelines	RED II	Ongoing project outputs
Better Cotton	ISO Net zero guidelines		SUSTCERT4BIOBASED D1.2 Review of SCLs, factsheets
FSC	ISO 13065		SUSTCERT4BIOBASED D3.1 Review on existing benchmarking tools and guidelines
Global GAP	NEN-EN 16751		STAR4BBS D1.1 Report on Policy Sustainability Targets
ISCC	SBTI FLAG requirements		STAR4BBS D3.1 on Sustainability Indicators
Oeko Tex Standards	UNCTAD 2020 Framework for the VSS assessment toolkit		HARMONITOR D4.1 Inventory of CSL requirements
Regenagri Standards	UN High level Expertgroup Report on Net Zero		
RSB			
RSPO			

Figure 12. Overview of reviewed documents for preparation of content level BMT

The second step was the categorization of the identified sustainability principles and criteria in terms of sustainability dimensions. A holistic approach was followed, with equal consideration of all three pillars of sustainability (environment, social and economic). Furthermore, attention was paid to ensure the contribution of biobased products to a circular economy, including aspects such as resource efficiency and recyclability of biobased products. Therefore, principles and criteria were categorized under 4 dimensions or categories: environment, circularity, social, and economic.

The third step was the definition of requirements under each sustainability criteria and assigning it a level. Following several rounds of reviews and consultations internally with experts within the cluster, as well as externally with targeted stakeholders through co-creation workshops, bilateral meetings and a survey, three levels were determined (mandatory, basic and advanced) and each requirement was assigned one of these levels. An explanation of what these requirement levels entail can be found in section 3.2.2.2. Finally, an evaluation mechanism was developed to present the assessment results.

As described in section 2.1, an iterative approach was employed in the development of the content level BMT. Two testing phases were conducted, each followed by a revision of the BMT based on the generated feedback. Following the first testing phase, feedback was collected from the testers as well as the CSL owners which led to the first revision of the BMT.

## BioBasedCert Monitoring Tool (BMT)

### Pre-assessment

<b>Name of scheme</b> <input type="text"/>			
<b>Applicable feedstock 1</b> <input type="text" value="Crop"/>	<b>Applicable feedstock 2</b> <input type="text" value="Forest"/>	<b>Applicable feedstock 3</b> <input type="text" value="Agrarian and forestry residues"/>	<b>Applicable feedstock 4</b> <input type="text" value="Waste and residues"/>
<b>Applicable value chain actor 1</b> <input type="text" value="Biomass producer"/>	<b>Applicable value chain actor 2</b> <input type="text" value="Industrial processor"/>	<b>Applicable value chain actor 3</b> <input type="text" value="Final product manufacturer"/>	
<b>Applicable principles (Yes/No)</b>			
Environmental management	Yes		
Climate change management	Yes		
Sustainable Land Use Management	Yes		
Protection of Biodiversity	Yes		
Chemical Use Management	Yes		
Soil management	Yes		
Air quality	Yes		
Water Quality and Conservation	Yes		
Energy Use & Efficiency	Yes		
Circular resource use	Yes		
Circular design & material cycling	Yes		
Responsible waste management	Yes		
Labour and human rights	Yes		
Healthy and safe working conditions	Yes		
Wellbeing of the local community	Yes		
Wellbeing of consumers	Yes		
Economic and financial viability	Yes		
Fair business practice	Yes		
Risk management	Yes		

Figure 13 Screenshot of the pre-assessment tab of content level BMT

One of the main observations was the difficulty the tester faced in deciding on which principles were within the scope of the CSL considered. To facilitate the definition of the scope of the CSLs to be tested in the second testing phase, a scope defining questionnaire was designed. This questionnaire was sent to the CSLs involved in the second testing round asking them to choose which feedstocks, value chains, and sustainability topics were in scope for their CSL (included as step 0 in Figure 3). This was used as input in the pre-assessment tab of the content level BMT (see Figure 13) in the second testing round, based on which the inapplicable requirements within the BMT are automatically filtered out. Another feedback was that the requirements were often assessed as not covered if following strictly the exact phrasing of the prescriptive requirements. Based on that, the requirements were reviewed and the highly prescriptive ones were adapted to accommodate different ways for CSLs to cover the intent of the corresponding criterion provided the intent is there. Once consensus on the integration of feedback and changes to the BMT was reached in the first revision of BMT, the changes were integrated into a new version of the BMT that was used in the second testing round.

The second testing phase also generated relevant feedback from testers and CSL owners that was used as input for final revision. Here, one of the main observations was that some schemes deliberately do not include detailed prescriptive requirements, but rather provide

a generic requirement and leave it to the operator to decide how to meet this requirement. Accordingly, it was decided to reformulate the requirement levels in terms of mandatory – basic – advanced. Mandatory refers to must (i.e., minimum) requirements, basic to more detailed requirements, and advanced to aspirational requirements.

Additionally, SUSTCERT4BIOBASED partner and certification body Control Union (CU) conducted a review of BMT requirements by auditors/scheme experts to ensure an appropriate balance between practicality and comprehensiveness. CU scheme experts provided feedback in terms of how to make the requirements more feasible and applicable in practice. Based on the feedback received, a more thorough review and simplification was made especially in the social dimension by grouping and merging requirements where possible to increase conciseness and thus practical applicability of the tool.

### 3.2.2. Structure

The BMT content level has a four-layer structure (see Figure 14). The most overarching layer is the category, of which there are four in the content level: Environment, Circularity, Social, and Economic. Under each category, there are several principles. These principles are collections of various sustainability topics, such as Protection of Biodiversity, Circular design & material cycling, Healthy and safe working conditions, and Fair business practice. Under each principle, there are one or more criteria. These criteria are formatted as “The scheme requires...” or (exceptionally) “The scheme prohibits...”. Example: *The scheme requires safe handling and disposal of substances*. As these criteria can be quite broad, there are one or more requirements under each criterion. Example: *Storage, handling, use and disposal of substances is conducted based on the manufacturer’s safety instructions*. Each requirement has been assigned a level: mandatory, basic or advanced.

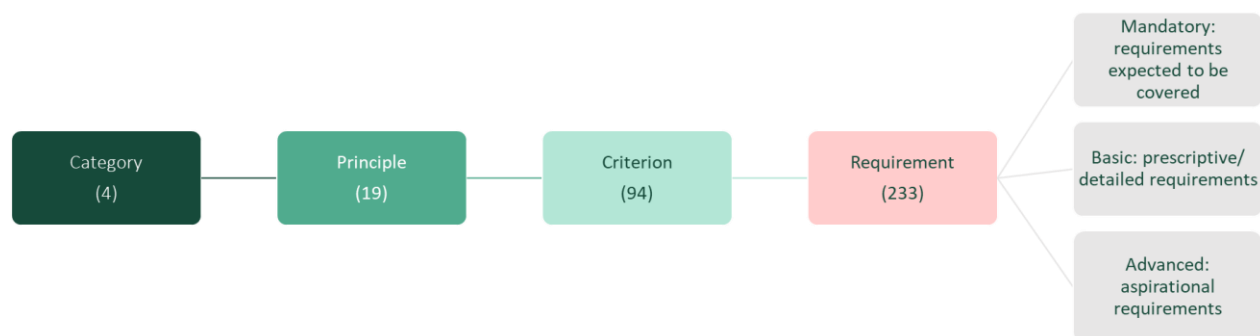


Figure 14. Structure of the content level BMT

### 3.2.2.1. Categories and principles

As mentioned above, in the content level, there are four categories: Environment, Circularity, Social, and Economic. These are based on the three dimensions of sustainable development with the addition of circularity, as this was considered an important separate addition, as this is currently not widely covered by existing CSLs in the biobased industry, yet highly relevant, especially for biobased products. In addition, the Minimum backstop umbrella requirement assesses whether schemes require adherence to applicable legislation. If this is not covered, the scheme will not be assessed on the rest of the criteria, as this is considered an initial essential requirement.



Figure 15. Overview of BMT content level categories and principles

Under each category, there is a varying number of principles (see Figure 15). In the Environment category, there are nine: Environmental management, Climate change management, Sustainable land use management, Protection of biodiversity, Chemical use management, Soil management, Air quality, Water quality and conservation, and Energy use & efficiency. Under Circularity, there are three principles: Circular resource use,

Circular design & material cycling, and Responsible waste management. The Social category has four: Labour and human rights, Healthy and safe working conditions, Wellbeing of the local community, and Wellbeing of consumers. In the Economic category, there are three principles: Economic and financial viability, Fair business practice, and Economic risk management.

These principles are based on the existing sustainability topics covered in relevant legislation, existing CSLs, and relevant sustainability topics for the biobased industry. The division of principles in the Environment category is a relatively standard topic grouping in various CSL standards. In the Circularity section, the principles were built based on the criteria and requirements relevant to the topic of circularity. The principles also represent the (traditional) lifecycle of a product – starting from the beginning of the value chain at resource use and extraction (Circular resource use), to design of the product and the potential placement of the material and product into the circular economy loop (Circular design & material cycling) and concluding in the end-of-life of the product (Responsible waste management). The social section principles were constructed to cover both relevant stakeholders (employees, local communities, and consumers/end users) as well as the relevant topics to each stakeholder. For example, the Labour and human rights and Healthy and safe working conditions principles concern mainly operator employees as well as subsidiaries and subcontractors. The two other principles, Wellbeing of the local community, which includes topics such as food and water security and land rights, and Wellbeing of consumers, reflect on consumer feedback and safety.

### **3.2.2.2. Criteria and requirements**

As seen in the earlier sections, each principle in the content level of the BMT includes a specific set of criteria, and specific requirement(s) linked to each criteria. The criteria are generally worded “The scheme requires...” and the requirements are specific things related to that criteria that need to be included in the CSL standards for operators seeking certification. An example criterion is: *The scheme requires supporting local development.* One of the requirements linked to this criterion is: *The operator engages in projects to support the local development of the communities it operates in.*

Three requirement levels were defined: mandatory, basic and advanced. Mandatory requirements are expected to be met currently by schemes. They are linked to legislation, sustainability protocols and conventions. Basic requirements provide more prescriptive details on the sustainability criteria. It was recognised that some schemes choose to

provide such detailed requirements in their standards, whereas some schemes intentionally do not prescribe this level of detail on their standards and leave these aspects to be decided by the organisations themselves in meeting the defined criteria. Advanced-level requirements are aspirational requirements. These requirements are not expected to be covered by the schemes at the moment, but were defined to drive continuous improvement. Some ambitious schemes may nevertheless already meet some of these requirements. CSLs can use the basic and advanced requirements detailed in the BMT to, for example, build a future improvement roadmap on specific topics and consider them in the update of their standards.

Early on in the development of the content level, it was realized that the schemes have quite a varying scope in terms of the applicability of their requirements to certain types of feedstock and value chain actors. Therefore, it was decided to mark for each sustainability requirement for which feedstock category and value chain actor they are applicable to. The defined feedstock categories are crop, forest, agrarian and forestry residues, and waste and residues. There is different categorization of primary residues from agricultural and forestry, because their use has consequences for soil quality. Waste and residues refers to non-primary residues such as secondary residues and wastes arising from industrial processing of biomass, and tertiary residues and waste, which include urban and post-consumer outputs. The defined value chain actor categories are biomass producer, industrial processor and final product manufacturer. Biomass producers include farmers and plantation or forest managers. Industrial processors process biomass and/or intermediates/semifinished products. Final product manufacturers conduct the final steps of processing to biobased products and/or valorises (processed) biomass for application in finished products. In the scope definition, by selection of the applicable feedstocks and value chain actors for the CSL, it is possible to filter the content level BMT requirements applicable to each of the assessed CSLs.

Requirements are based on, for example, existing requirements in CSL standards, relevant sustainability hotspots for the biobased industry, other monitoring tools for CSLs, but also on relevant regulation. For example, a specific deforestation-related criterion (i.e. criterion EN-LUM-9 *The scheme requires that raw material is not obtained or procured from deforested areas.*) is based on the EU Deforestation Regulation (EUDR). The applicable requirements of the Renewable Energy Directive (RED III) are integrated into BMT criteria as follows:

- RED 29(4): Criterion EN-LUM-1
- RED 29(5): Criterion EN-LUM-2



- RED 29(6): Criterion EN-LUM-3
- RED 29(7): Criterion EN-LUM-4
- RED 29(3): Criterion EN-BD-2
- RED 29(2): Criterion EN-SM-1

The full list of requirements can be seen in the BMT Excel document. An overview of the criteria topics can be seen in Table 4.

Table 4. Overview of content-level criteria

Principle	Overview of criteria topics
<b>Environment</b>	
Environmental management	Management plans for environmental topics, targets, monitoring
Climate change management	GHG emission calculations and reporting, reduction activities and roadmaps
Sustainable land use management	Sustainable raw material sourcing and harvesting, forest management plans, land use management methodologies, regenerative practices, deforestation, ILUC risk management
Protection of biodiversity	High biodiversity values documentation and protection, biodiversity assessment, buffer zones and field margins, habitat fragmentation, invasive species, GMO, pollinator habitats
Chemical use management	Integrated Pest Management plans, appropriate use and application of plant protection products, safe substance handling, regulated usage and phase-out of hazardous substances,
Soil management	Soil quality and soil carbon, soil erosion prevention, minimal intervention techniques, nutrient management plan
Air quality	Reducing the emission of harmful pollutants
Water quality and conservation	Controlled usage, efficiency optimisation, water pollution prevention, water use documentation
Energy use and efficiency	Energy management plan, use reduction targets, renewable energy

Principle	Overview of criteria topics
<b>Circularity</b>	
Circular resource use	9R Framework, cascading use, regenerative harvesting, circular inflow increase, circular procurement plan
Circular design and material cycling	Reuse and recycling of residual flows, material efficiency improvements, design for repairability and reusability, high-quality recyclability
Responsible waste management	Safe and proper waste storage, transportation and disposal, open-air burning and landfilling prohibition
<b>Social</b>	
Labour and human rights	Human rights and ILO core convention adherence, child labour, forced labour, freedom of association and collective bargaining, fair remuneration, grievance mechanisms, disciplinary procedures, fair contract practices, discrimination (incl. gender equality, abuse and violence), skill development, social security (incl. maternity leave), legitimate employment agencies, subcontractor and subsidiary management
Healthy and safe working conditions	Health and safety risk management and documentation, first aid response, safe water and sanitation, working hours, employer-provided accommodation
Wellbeing of the local community	Land and water use rights, stakeholder engagement, local community engagement, food and water security impact management, local development
Wellbeing of consumers	User feedback opportunities, chemical safety risk assessment
<b>Economic</b>	
Economic and financial viability	Business plans and records
Fair business practice	Action against and documentation of fraudulent practices, written contracts
Economic risk management	Financial risk management, vulnerability minimisation

### 3.2.3. Evaluation mechanism

Different options for presenting the results were discussed throughout the development of the BMT. It was decided not to have a single overall CSL performance score or to define certain achievement levels (e.g., gold/silver/bronze) or ranking systems (e.g., 5-point scale/stars).

Instead, it was decided to provide results per principle under each category. This was considered to be more transparent and avoid making comparisons of single scores. Comparing single scores would not be appropriate or useful, as schemes have quite varying scopes, meaning that the applicable requirements for each would be different.

Moreover, it was decided to provide the results separately for each requirement level (mandatory, basic and advanced). This gives clarity on the performance of the CSL and also prevents a CSL from scoring poorly if, for example, the only requirements not met are advanced (i.e., aspirational) requirements.

Accordingly, the reporting of the results was decided to be presented as tables, showing under each principle and each requirement level as follows: the first number (numerator) representing the number of applicable requirements met, and the second number (denominator) the total number of applicable requirements. For example, in the example in Table 5, a fictitious scheme would have met two out of the four basic requirements that were applicable to it in the Water quality and conservation principle.

Table 5. Example content level BMT assessment results table, Environmental category

PRINCIPLE	<i>Fraction of applicable requirements covered</i>		
	Mandatory	Basic	Advanced
Environmental management	1/1	2/2	N/A
Climate change management	1/1	3/3	0/3
Sustainable land use management	5/5	5/7	0/4
Protection of biodiversity	2/2	10/12	1/2
Chemical use management	4/5	5/8	3/4
Soil management	3/4	5/5	0/4
Air quality	1/1	0/1	N/A
Water quality and conservation	3/3	2/4	1/1
Energy use & efficiency	N/A	N/A	0/4

### 3.3. Outcome level

#### 3.3.1. Development process

The development of the BMT outcome-level methodology followed an iterative and collaborative approach, as illustrated in Figure 16.

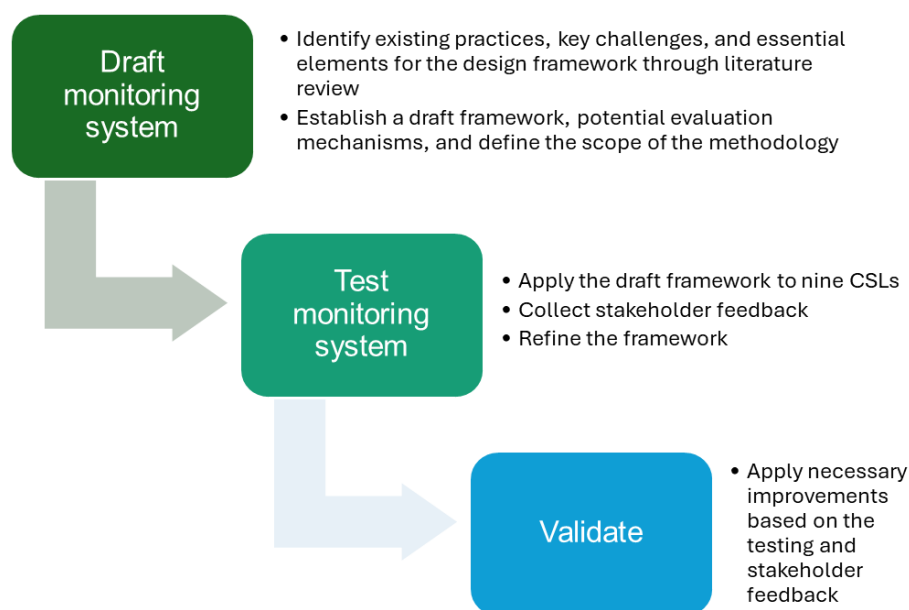


Figure 16 Outcome level BMT development process

The process began with a literature review to establish a draft conceptual foundation for the BMT outcome-level methodology. While governance and sustainability requirements have been more extensively assessed, outcome monitoring for CSLs remains a relatively new and evolving field. To address this gap, we examined a broad range of scientific and grey literature, including reports from recognised sources such as the Delta Framework and ISEAL. Particular attention was given to existing approaches for evaluating CSL effectiveness, common challenges in assessing outcomes, and the key components required for a robust outcome-level methodology. Drawing on these insights, we defined the scope of the methodology, with a focus on tracking measurable progress over time.

Building on the literature review findings, we conducted in-depth interviews with CSL owners during the testing stage. These interviews explored how CSLs define “impacts” within their respective contexts, the methods they currently use to evaluate and demonstrate impact, and the feasibility of monitoring outcome-level changes. These insights were critical in assessing the applicability, relevance, and usability of the

framework. In addition to the interviews, stakeholder input was also collected through co-creation workshops and individual consultations with scheme owners.

Between the two testing stages, the draft conceptual framework was revised and refined based on stakeholder feedback. Feedback was sourced from two main groups: (i) the assessors—HARMONITOR project partners who applied the outcome-level methodology to evaluate selected CSLs during the testing stage and (ii) participating CSL owners. This feedback was discussed during internal team meetings and used to revise indicator formulations and the accompanying guidance notes. Through this iterative development, the framework was refined and systematically structured into a hierarchical set of categories, principles, criteria, and indicators (see Section 3.3.2). Additionally, based on stakeholder feedback, we introduced a distinction between core and add-on outcome level indicators, along with guidance on their applicability depending on the type of CSL, to enhance relevance across different CSLs.

To further support the validation process, additional input after the testing phase was collected from participating CSL owners through a short online questionnaire. The questionnaire contained both closed and open-ended questions and aimed to assess:

- The perceived feasibility of applying the methodology;
- Its usefulness in supporting CSLs to demonstrate sustainability impact;
- Methodological elements that were considered most or least relevant;
- Any aspects viewed as insufficiently addressed by the methodology.

This feedback provided practical insights into the value and limitations of the monitoring system from the perspective of those who would potentially apply or be evaluated by it.

Following the validation process, the participating CSLs were reassessed using the validated version of the BMT outcome level methodology. The aim of the reassessment was twofold: to confirm that the revised indicators improved clarity and usability, and to generate updated results based on the final methodology.

### **3.3.2. Structure**

Similar to the system and content level, the BMT outcome-level methodology is structured around a hierarchical framework comprising categories, principles, criteria, and indicators for evaluating CSLs. The core framework includes two categories, five principles, and

twenty-four indicators (Figure 17). In addition to these core components, the methodology also incorporates one add-on criterion and three add-on indicators. These add-on elements are not included in the primary assessment, as they reflect more advanced conditions that may currently fall outside the operational scope of many CSLs. Nevertheless, they are regarded as aspirational elements and are recommended for consideration in future iterations of the framework.

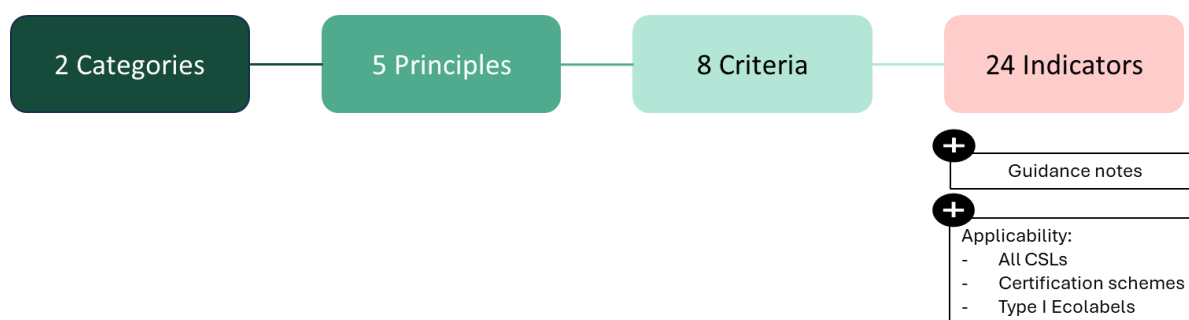


Figure 17 Structure of the BMT Outcome Level Methodology

As shown in Figure 17, the BMT outcome-level methodology distinguishes the applicability of indicators based on the type of CSL under assessment, i.e. certification schemes and type I ecolabels. Indicators can also be relevant to both CSL types and are labelled as “All CSLs” under *Applicability* (see Annex B, BMT outcome level Excel file, tab InitialAssessment). This differentiation is essential, as Type I ecolabels and certification schemes often reflect fundamentally different philosophies, structures, and approaches to sustainability. Type I ecolabels set their criteria based on life cycle considerations. They evaluate a product’s environmental impact across its entire life cycle and apply multi-criteria assessments covering aspects such as energy use, chemical use, and toxicity. Certification schemes can vary widely in their scope and focus. Some address a single attribute or operate within a specific sector (e.g. organic certification, FSC in the forestry sector), while others cover multiple sustainability aspects or sectors (e.g. ISCC, RSB). Recognising these distinctions allows for a more equitable and context-sensitive assessment.

To ensure consistency in the benchmarking process, guidance notes are provided alongside relevant indicators. These notes clarify how each indicator should be interpreted and applied, taking into account the specific characteristics of different CSL types. Where appropriate, the guidance also outlines when indicators may be considered not applicable, helping assessors to apply the methodology in a uniform and transparent manner.

### 3.3.2.1. Categories and principles

As depicted in Figure 18, the BMT outcome level consists of two categories:

1. Measurable progress of operators, and
2. Measurable progress of the CSL.

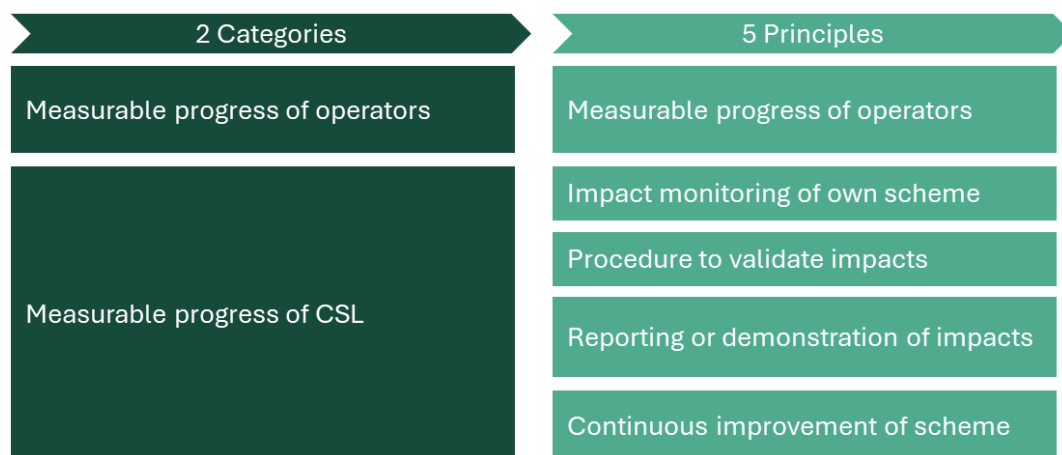


Figure 18 Categories and principles of BMT outcome level

These categories were defined based on insights gathered during the testing phase, which revealed that progress and outcomes can be driven at individual operators and the overarching CSL levels. One of the primary ways CSLs drive progress is by regularly revising and updating their standards—typically on a five-year cycle. This process encourages certificate holders to align with evolving sustainability objectives. By raising the bar over time, updated standards reflect the advancements made by certified entities and support the achievement of more ambitious sustainability targets.

Another key mechanism through which CSLs aim to generate impact is by promoting the adoption of their certification by organisations and fostering the continuous improvement that follows. This approach is particularly prevalent among sustainability schemes focused on specific sectors or commodities, rather than Type I ecolabels. In many cases, CSLs actively encourage—or even require—ongoing improvement as a condition for certification renewal.

The category measurable progress of operators consists of one principle (i.e. measurable progress of operators), while the measurable progress of the CSL contains four principles (i.e. impact monitoring of own scheme, procedure to validate impacts, reporting or demonstration of impact, and continuous improvement of CSL). Each principle is briefly described below to highlight its main focus.

**Principle: Measurable Progress of Operators**

This principle requires certified operators to systematically address key sustainability issues and to demonstrate measurable progress toward clearly defined sustainability objectives over time. The principle highlights the need for continuous improvement at the operator level, whereby actions are not limited to initial compliance but instead fosters continuous advancement towards long-term, outcome-oriented performance management. The underlying objective is to ensure that certified operators are accountable for delivering improvements that align with the intended sustainability outcomes.

**Principle: Impact Monitoring of Own Scheme**

This principle addresses the internal learning and evaluative capacity of the CSL. It requires schemes to undertake systematic efforts to monitor and assess their actual impacts over time.

**Principle: Procedures to Validate Impacts**

This principle is concerned with ensuring the reliability and credibility of data used to assess sustainability impacts. It requires schemes to verify the accuracy and validity of monitoring results, and, where applicable, to oversee and evaluate the performance of recognized third-party schemes.

**Principle: Reporting or Demonstration of Impacts**

This principle focuses on the transparent communication of sustainability performance and impacts achieved by the scheme. It underscores the importance of accountability by requiring CSLs to disclose relevant results and demonstrate the effectiveness of their actions.

**Principle: Continuous Improvement of the Scheme**

This principle supports ongoing learning and adaptability within certification schemes by requiring them to regularly revise their standards, procedures, and practices based on performance data, monitoring results, and stakeholder input.

**3.3.2.2. *Criteria and requirements***

As previously outlined, the BMT Outcome Level comprises eight criteria and twenty-four indicators. These criteria translate overarching principles into concrete, actionable elements. The indicators represent the most granular level in the framework's hierarchy and are directly employed in outcome-level assessment. An overview of the topics



addressed under each criterion is presented in Table 6. A comprehensive list of the BMT Outcome Level indicators is provided in the BMT Excel file (see Annex A).

Table 6 Overview of BMT outcome level criteria topics

Principle	Overview of criteria topics
<b>Measurable progress of operators</b>	
Measurable progress of operators	Criterion A.1: Monitoring and demonstration of the effectiveness of the systematic approach to achieve sustainability goals by economic operators and CSL; assessment of sustainability hotspots; baseline assessment
<b>Measurable progress of CSL</b>	
Impact monitoring of own scheme	Criterion B.1: Clear definition of intended impacts; Theory of Change, causal pathways or similar framework; Criterion B.2: Regular performance monitoring, outcome evaluation, and impact evaluation; quantitative assessment of sustainability outcomes
Procedure to validate impacts	Criterion C.1: Procedure for verification of impact monitoring data; verification of impact monitoring data by third-parties
Reporting or demonstration of impacts	Criterion D.1: Regular reporting to track progress, allow comparisons, and explain improvements; quantitative results of monitoring
Continuous improvement of scheme	Criterion E.1: Revision of standards based on operator progress; Criterion F.1: Continuous learning and improvement of the standard

### Applicability of Indicators

Regarding the applicability of indicators, indicators under the *measurable progress of operators* criterion apply exclusively to certification schemes. Type I ecolabels are exempt due to their distinct approach, which focuses on promoting products with superior environmental performance based on predefined criteria, rather than tracking operator-level change over time. Unless otherwise stated, the indicators under Criteria B.1, B.2, C.1, D.1, E.1, and F.1 are generally applicable to all CSLs, except in cases where specific elements fall outside the scope of the scheme being assessed. These exceptions are detailed in the guidance notes for each indicator (Column H)

### Add-on Indicators

In addition to the topics presented in Table 6, the outcome-level indicators also include supplementary areas addressed through optional add-on indicators. A brief description of these add-ons is provided below.

- **Add-on-1** (under criterion *Measurable Progress of Operators*) encourages schemes to conduct a baseline sustainability assessment of certified operators. This assessment helps establish initial conditions across relevant sustainability dimensions and supports meaningful goal-setting and progress tracking.
- **Add-on-2** (under criterion *Procedure to Validate Impacts*) applies when a scheme recognises or accepts results from another certification system. In such cases, the scheme must clearly define roles and responsibilities, implement appropriate monitoring procedures, and evaluate third-party performance to ensure accountability and credibility. These measures are critical for ensuring that the outcomes claimed by the scheme or its certified operators remain reliable and can be properly verified, even when external systems are involved.

### 3.3.3. Evaluation mechanism

The BMT outcome-level methodology is intended to support continuous improvement within individual certification schemes, rather than to enable direct comparisons across different schemes. Accordingly, the associated evaluation mechanism is designed to identify areas for internal development and enhancement. In line with this purpose, the methodology adopts a qualitative rather than quantitative scoring approach, allowing for nuanced, non-numeric assessments of CSL performance against the outcome-level framework.

The benchmarking process applies a four-tier qualitative assessment scale: Fully, Partly, Missing, and Not Applicable. Assessment results are presented at the indicator level, with indicators organised under their respective criteria (see Figure 19). This structure offers a detailed overview of each scheme's strengths and areas for improvement, thereby facilitating focused, scheme-specific enhancements.

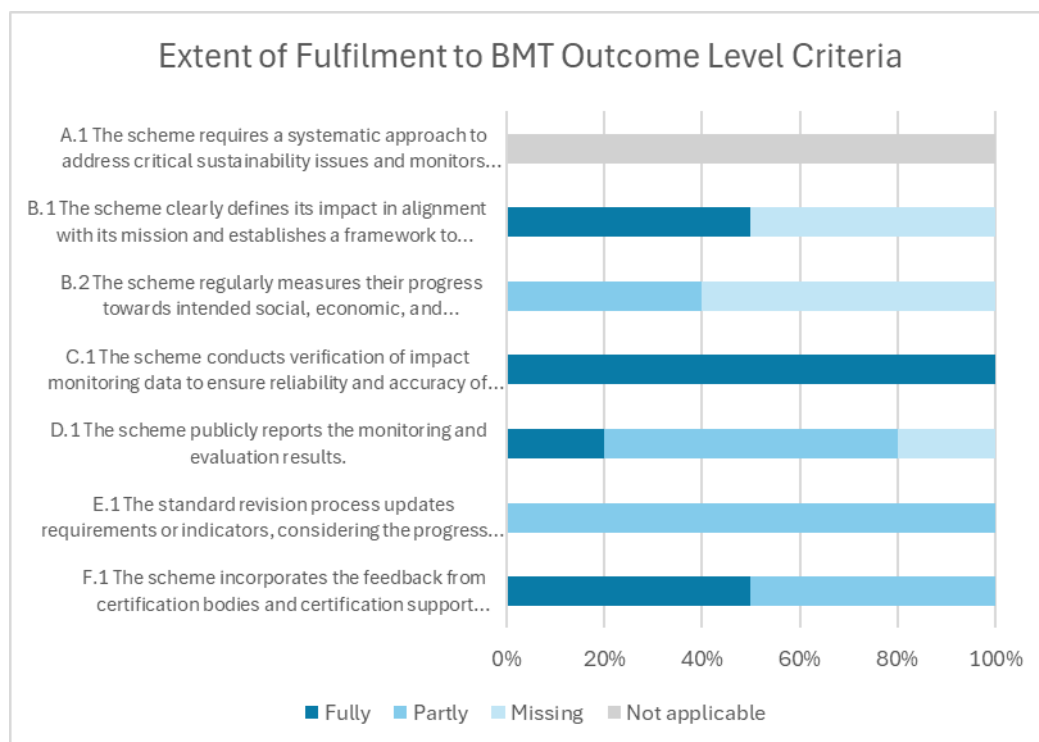


Figure 19 Example visualisation of benchmarking results. The percentage refers to the degree of fulfilment of the assessed CSL with respect to a criterion.

The evaluation mechanism is also supported by a structured approach to evidence collection, organised around three sequential gates:

- Availability of evidence – confirming that relevant documentation or data exists.
- Consistency of evidence – where multiple sources are available, assessing whether they lead to the same conclusion.
- Demonstration of progress – evaluating whether the evidence shows measurable improvement over time.

An illustrative example of this assessment and visualization process is provided in Table 7.

Table 7 Illustrative example of assessment results for a fictitious scheme, visualising results from the literature review

BMT Sustainability Principle	Impact monitoring indicators	Data from CSL owners			Data from independent parties	
		Regularly monitored?	Regularly reported?	Trend identified?	Evidence from third party available?	Consensus reached?
ENVIRONMENTAL						
Climate change	Greenhouse Gas emissions per tonne of certified materials produced					
Chemical use	Volume of pesticide active ingredient applied					
SOCIAL						
Portection of labour rights	Numbers of workers protected under CSL standard					
ECONOMIC						
Productivity	Yield					

## 4. Guidance notes for the BMT

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The BMT has three levels: system, content and outcome. Each level operates with a somewhat different evaluation and scoring system due to the different natures of the information assessed. In this section, the mechanism of each level is explained and instruction notes are provided which the users can use for guidance when making evaluation of CSLs using this tool.

### 4.1. System level

The “Requirements and guidance notes” column helps the evaluator better understand the indicator and provides examples of how the requirements may be fulfilled. Its purpose is to inform the evaluator, not set additional requirements.

The scheme/label receives points based on the number of criteria/requirements it meets under each principle at the system level. The evaluator fills in cells in columns “Requirement fulfilled” and “Points received”, while cells in columns “% of Requirement fulfilled” and “% of points per Principle” are automatically filled in (no need to manipulate these or the “Results” tab in the Excel file).

Each criterion has one requirement. The points the scheme receives depend on how many requirements it meets. For each criterion/requirement, the assessor chooses “Yes, fully” or “Yes, partially” (the scheme meets the requirement) or “No” (the scheme does not meet the requirement). An additional option is also “Not Applicable”, which is used when the requirement is not applicable to the scheme/label being assessed, determined by the guidance note description.

Compliance with requirements is assessed and for each criterion, either 2, 1, or 0 points are awarded with the following methodology:

- 2 points: the scheme fully meets the specified requirement of a criterion.
- 1 point: the scheme partly meets the requirement of a criterion (partial fulfilment).
- 0 points: the scheme does not meet the requirement.
- If a requirement is not applicable to the scheme, this is not factored into the scoring (N/A).

Each criterion receives a score of either 0%, 50% or 100%. If the response option is “Yes, fully” it is scored the maximum number of points and awarded a score of 100%. For example, if there are three response options (0-1-2), and it is scored 2 based on the found

evidence of requirement fulfilment, it will receive 100%. If the response option is “Yes, partially”, then it is scored 1 point and it receives 50%. If the requirement is not met at all, it is scored 0 and receives 0%. In another example, if there are only two response options (0-1) and it scores 1, it will receive 100% - full fulfilment of that criterion.

The overall score for the principle is then automatically calculated based on the average percentage of all criteria under that principle.

#### Determining the final score

For the system level, each criterion within a principle is assessed, and the percentage of requirements met is calculated. The average percentage for the principle is determined by averaging the percentages across all its criteria. For example, if a principle consists of three criteria with fulfilment percentages of 50%, 75%, and 100%, the average value for that principle would be  $(50\% + 75\% + 100\%) / 3 = 75\%$ .

#### Ensuring equal topic representation

Each category has a certain number of principles (e.g., standards consultation, assurance system, governance structure). Each of these principles has a different number of criteria within it. To ensure that no principle plays a larger role in the end score solely due to the number of criteria within it, each principle's total points are assigned in the same manner (by averaging values of criteria scoring), so that each principle is worth the same within a category.

## 4.2. Content level

### 4.2.1. Overview of the BMT content level structure

The content level comprises of four categories:

- **Environment**
- **Circularity**
- **Social**
- **Economic**

There is also the minimum backstop requirement, **Min. backstop** on adherence to laws. Each category is included as separate tabs in the BMT content level Excel file. Each category has several principles (**column B**), followed by criteria codes (**column C**) and criteria (**column D**). Requirements linked to each of the criteria can be found in **column E**. Users enter evaluation about requirement fulfilment to **Column F** (with the response options “Yes”, “No” [assessor input]). The user also provides a justification for the given score in **Column G** and reference for the source used for the evaluation in **Column L** (justification for score and source reference [assessor input]). **Column H** includes

examples and context, such as additional context to help the assessor understand the requirements or provides a reference to the Glossary tab. **Column I** (requirement level) indicates the level of the requirement which is either mandatory, basic, or advanced. **Column J** (applicable feedstocks(s)) and **Column K** (applicable value chain phase(s)) provide additional information about the applicability of the requirement to the feedstock categories and to value chain actors, respectively.

The assessor starts with filling in the **Pre-assessment** tab. This tab allows the assessor to align the scope of the assessment with the scheme to be assessed. The assessor indicates the type(s) of feedstock, value chain actor(s) and principles deemed applicable to the scheme. In the case that a feedstock, value chain actor or principle is considered out of scope, the connected requirements are automatically excluded from the assessment.

#### 4.2.2. Instruction notes

1. Open the "Pre-assessment" tab.
2. Fill in the name of the scheme being assessed.
3. Choose the feedstock applicable to the scheme. If all four feedstocks listed in the drop-down menu are applicable, select one for each empty cell with a drop-down menu (if not already selected). If not all are applicable, only select the applicable ones and change the non-applicable feedstock cells to blank cells (available in drop-down menu).
2. Choose the value chain phases applicable to the scheme. If all three value chain phases listed in the drop-down menu are applicable, select one for each empty cell with a drop-down menu (if not already selected). If not all are applicable, only select the applicable ones and change the non-applicable value chain phases cells to blank cells (available in drop-down menu).
3. Choose whether all the principles are relevant to your scheme. The assumption should be that all principles are relevant, unless explicitly justified by the scheme. When first starting an assessment, it is recommended to keep all of these as "Yes", unless a scheme justifies non-applicability of a principle. When this happens, you can check "No", and the results will automatically be modified.
4. Start the assessment with the "Min. backstop" tab. After that, you can continue with any of the following tabs: Environment, Circularity, Social, or Economic. Go requirement by requirement, selecting "Yes" or "No" from the drop-down menu for each requirement (column F). "Yes" means that the scheme fulfils the requirement, "No" that it does not.

5. This assessment should be done by reviewing the relevant standard documents. If the requirement is fulfilled justification is provided (in column G) referring to how and where it is covered in the relevant standard documents of the scheme. The source used for justification is filled in column L.

6. When the assessment is complete, go to Results\_ContentLevel to see the results displayed in tables for each category distinguished per principle and requirement level. Results are provided as the fraction of applicable requirements covered from all applicable requirements for that principle and requirement level.

### 4.3. Outcome level

#### 4.3.1. Overview of the BMT outcome level structure

The BMT outcome level tool consists of three assessment tabs:

- InitialAssessment
- ImpactMonitoringIndicators
- LiteratureReview

The "InitialAssessment" tab constitutes the first stage of the BMT Outcome-Level evaluation methodology. It offers a systematic approach to examining how a CSL defines, assesses, and demonstrates progress toward sustainability outcomes. This stage is designed to ensure that mechanisms are in place to monitor, validate, and communicate measurable impacts.

The structure of the outcome level is reflected in the "InitialAssessment" tab and mirrors the hierarchy of the BMT Outcome-Level framework. It is organised across several columns: Categories (Column A), Principles (Column B), Criteria (Column C), and Indicators (Column G). Each criterion and indicator is assigned a specific code, helping to ensure that results are transparent and comparable over time.

To guide assessors in applying the methodology consistently, guidance notes are included in Column H where relevant. Additionally, Column I outlines the applicability of each indicator, helping assessors determine whether a given indicator is relevant for the CSL under evaluation.

Three columns are designated as mandatory fields for assessors to complete:

- Column J – to indicate the level of fulfilment of each BMT outcome-level indicator, based on the four-tier scale.



- Column K – to provide a justification or evidence base supporting the assessment.
- Column L – to record the sources of information used during the evaluation.

Following the initial assessment, the evaluation moves to evidence collection (Tabs "ImpactMonitoringIndicators" and "LiteratureReview"). This phase examines what the scheme has actually demonstrated in practice. This sequential approach supports a structured and transparent evaluation process. Moreover, grounding the evaluation in documented evidence enhances its methodological rigour and allows for a thorough analysis of impact demonstration across CSLs.

#### 4.3.2. Instruction notes

The aim of this exercise is to evaluate how the scheme currently performs in relation to the outlined principles and to identify where the gaps lie. The findings, especially the explanations (Column K), will help us understand the scheme's efforts and approaches to making measurable progress. By following this methodology, assessors can provide transparent, evidence-based evaluations of CSL performance.

To conduct the BMT outcome level assessment, assessors should follow the following steps.

#### Benchmarking (Tab "InitialAssessment")

- 1 Data Collection & Preparation - before starting the assessment
  - Review each principle, criterion, indicator as well as its applicability.
  - Gather relevant scheme documents (e.g., standards, outcome monitoring reports).
  - Review the CSL's official website for publicly available impact data and relevant information.
  - Identify any additional sources that provide insight into how the CSL tracks and reports its impacts.
2. Evaluation Using the Framework and Documentation of Results
  - For each indicator, determine the level of compliance using the four-category scale:
    - Fully (meets all conditions outlined in the indicators)
    - Partly (some elements missing)
    - Missing (not met at all)
    - Not Applicable (indicator does not apply to the CSL)

For example, Indicator C.2.1 evaluates the existence of one-way or mutual recognition mechanisms. If a CSL does not include such mechanisms in its scope or practice, the indicator would be considered not applicable.

- Use the guidance notes provided in the extended framework to ensure consistency in interpretation.
- Document rationale for each scoring decision under column “Justification or evidence” and mention sources of the evidence under column “Source”. Sources may be scheme documents or websites. The document version should be mentioned to ensure traceability of assessment.
  - If information is incomplete or unavailable, assessors should make a best-effort assessment and document the rationale.
  - If necessary, seek clarifications from scheme owners (e.g. through interviews).
  - If necessary, cross-check results with other assessors for consistency.

### Collecting evidence (Tab “LiteratureReview”)

As part of the literature review exercise, assessors are required to collect evidence reporting on the impacts of the CSL under evaluation. For each relevant impact indicator, assessors should summarise the number of studies that report positive, negative, or no significant impacts. In addition, they should assess the robustness of each study and provide the corresponding references.

Evidence of **positive impacts** should be recorded as follows:

- **Column E** for the most robust studies,
- **Column G** for studies of moderate robustness, and
- **Column I** for studies where the robustness is uncertain.

Evidence of **no significant impact** should be recorded in:

- **Column K** for the most robust studies,
- **Column M** for moderately robust studies, and
- **Column O** for studies with unclear robustness.

Evidence of **negative impacts** should be captured in:

- **Column Q** for robust studies,
- **Column S** for less robust studies, and
- **Column U** for studies of uncertain robustness.

This structured approach allows for a transparent summary of the existing evidence base, differentiated by both impact direction and study quality.

## 5. Conclusions

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The BIOBASEDCERT Monitoring Tool (BMT) has been developed jointly by the BIOBASEDCERT cluster to assess the robustness, comprehensiveness and effectiveness of existing voluntary sustainability certification schemes and labels (CSLs) for biobased products and biological resources intended for industrial biobased value chains.

BMT is structured in three levels:

- System level focuses on system characteristics, including governance, traceability, and assurance.
- Content level focuses on the sustainability requirements of the CSLs.
- Outcome level focuses on evidence of the performance and impact generated by the implementation of CSLs.

This deliverable presented on the three levels and their requirements, as well as on the development process, structure, resulting principles and criteria, and evaluation mechanism. It also includes guidance notes on using the tool which is provided as an Annex to this deliverable.

The strength of any certification scheme lies in the robustness of the standard it refers to and its governance and operations, which ensure that the certification process is thoroughly met and that stakeholders can trust its outcomes. This was handled with the development of the *BMT System level* considering that the robustness of a certification scheme requires strong governance, transparent standard-setting, reliable assurance mechanisms, and clear traceability frameworks. These encompass governance structure, rigor of audits, strong policies for product labelling, efficient complaints mechanisms, accurate claims use, among others. Together, these elements shape the reliability of a certification scheme and inspire confidence and trust among stakeholders, which is essential to ensure adherence to established standards. Schemes with strong system-level performance can enhance their market positioning and attract more stakeholders: Robust system-level indicators can also support certification schemes comply with regulatory requirements, such as the Green Claims Directive (GCD), and a robust system reduces the risk of greenwashing, ensuring that sustainability claims are backed by verifiable processes. Overall, benchmarking against BMT system-level indicators highlights scheme's strengths and weaknesses, giving it a clear roadmap for improvement.

Building on a foundation of credible and transparent governance and scheme management, the sustainability requirements that CSLs set for operators seeking certification in the CSL standards are a critical part of every CSL. The *BMT Content level*

assesses the contents of CSL standards and to what extent they cover sustainability topics relevant to the biobased industry and to the feedstock and value chain actors certified by the CSLs. The content level BMT was designed to have a comprehensive coverage of all relevant sustainability aspects with equal consideration for the three pillars of sustainability: environment, social and economic. Additionally, in order to ensure the contribution of biobased products to a circular economy, circularity was included as a fourth criteria. The requirements detailed in the content-level can support in assessing the general sustainability topics coverage of the scheme as well as act as a roadmap for future improvements in the content of CSL standards.

The iterative and participatory development of the *BMT Outcome level* methodology has resulted in a critical foundation for addressing key methodological gaps in assessing the effectiveness of CSLs. The resulting methodology is both conceptually grounded and empirically informed, drawing on literature, stakeholder engagement, and practical testing. It comprises a structured set of core and add-on indicators, supported by detailed guidance and indicator applicability based on CSL type. Along with a qualitative assessment approach, the methodology ensures consistency, transparency, and contextual relevance in its application. Overall, it offers a robust and adaptable tool to support continuous improvement within CSLs and to more effectively demonstrate measurable progress toward sustainability outcomes.

# Annex A. BIOBASEDCERT Monitoring Tool

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BIOBASEDCERT%20M  
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# Annex B. Outcome level updated results

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BIOBASEDCERT  
Monitoring Tool (BMT)