



BIOBASEDCERT

Mid-term Policy Brief of the BiobasedCert Project Cluster

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Technical References

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1. Key Messages

- The lack of harmonisation between sustainability certification schemes and labels (CSLs) for biological resources, bio-based materials and products in EU markets, as well as the lack of monitoring of their robustness and effectiveness, has resulted in knowledge gaps and consequently uncertainties on their performance. These uncertainties are a barrier for the use of CSLs by industry and in co-regulation.
- There is a need for regulatory anchorage for CSLs, with appropriate guidelines to manage uptake of CSLs in line with EU policy priorities and international sustainable development ambitions. The results of a BiobasedCert survey showed that the majority of respondents are of the opinion that mandatory sustainability certification for industry is a positive thing and that the EU should regulate CSLs.
- The three Horizon Europe projects in the BiobasedCert cluster are together developing a Joint Monitoring System (JMS) to assist CSL owners and policymakers in evaluating the robustness and effectiveness of CSLs used in EU's bioeconomy. Working collaboratively takes advantage of the cluster participants' combined expertise to develop a coherent and overarching monitoring system. A JMS reduces confusion and divergences among users, and provides more clarity for policymakers in the transition to a bioeconomy.
- A collaborative platform for CSLs with its own governance is also being developed by BiobasedCert. The goal of the platform is to promote the continuous improvement and harmonisation of CSLs and to test and keep improving the developed JMS after the completion of the three cluster projects.

2. Background

A growing interest in the bioeconomy has spurred intense research and development activities as well as urgent attention to the circular design and the environmental, social and economic sustainability of bio-based materials and products. However, the sustainability of bio-based value chains can be hard to determine and regulate because chains can be long and complex with many intermediate products. CSLs are fundamental tools for enhancing and ensuring the sustainability and transparency of value chains.

2.1 Objectives of the BiobasedCert Projects Cluster

The projects [HARMONITOR](#)¹, [STAR4BBS](#)² and [SUSTCERT4BIOBASED](#)³, awarded with Horizon Europe grants under the call [ZEROPOL-01-07](#)⁴, have formed the BiobasedCert project cluster. The cluster aims to contribute to the evolution of CSLs and support the goals of the EU Green Deal through four overarching objectives:

- (i) develop and test a JMS for assessing the robustness and effectiveness of CSLs used in EU's bioeconomy;
- (ii) provide quantitative, transparent data on bio-based value chains through the analysis of trade flows (certified and non-certified);
- (iii) quantification of direct and indirect costs and benefits of certification as well as dissemination of results;
- (iv) involve relevant stakeholders, including scheme owners, policymakers, and industry, to co-create the JMS and set up a collaborative platform to promote continuous improvement and harmonisation of CSLs beyond the project timeline.

2.2 Guiding Policy Priorities

Policy frameworks governing the EU bioeconomy are partly fragmented and have been developed independently for different sectors.⁵ Despite fragmentation, a broad range of relevant EU policies⁶ directly or indirectly establish sustainability policy priorities for bio-based value chains. Previous research by

BiobasedCert partners⁷ showed that the most important sustainability risks of the bioeconomy match with the priorities set in relevant policies.⁸ In general, stakeholder opinions match with EU policy priorities and give the highest importance to ensuring that carbon used in chemicals and plastic products come from sustainable, non-fossil sources by 2030.⁹ All three BiobasedCert projects took into consideration EU sustainability policy priorities when determining the most relevant bio-based value chains for the EU. These policy priorities are also being considered by BiobasedCert in the development of the JMS to prioritise sustainability topics that should be monitored more closely.

2.3 Gaps in EU Targets

Findings from literature review and stakeholder consultation¹⁰ revealed that EU policies include a relatively large number of sustainability targets, but that most targets are general and stated in a noncommittal way. Sustainability requirements in those policies are ambiguous with the exception of those related to the energy sector. Furthermore, EU countries' progress towards a circular economy has halted in recent years, with insufficient focus on product design.¹¹ Thus, the current influence of EU and Member State sustainability and circularity policy frameworks on the industry is low. To fill these gaps, one solution can be to use CSLs in co-regulatory processes. CSLs have many advantages over EU, national or regional laws and regulations: CSLs can be adjusted relatively quickly to consider, for example, legal changes, new scientific insights, and changing views or ambitions from stakeholders and civil society. They can be applied to assess and steer operators toward sustainability along value chains, be designed for specific commodities and be more flexible than public regulation as well as complement it. However, while the advantages of CSLs might be strong on paper, their robustness¹² and effectiveness¹³ in actual application may be lower than expected due to inadequate oversight.

3. Research Findings

The scope of sustainability certifications for bio-based materials and products varies significantly depending on the value chain as well as on the certifications' geographical focus, the markets they address and the sustainability requirements they have chosen. These are topics investigated collaboratively by the BiobasedCert projects to obtain all essential inputs required for the successful development of the JMS.

3.1 Value Chains

Following different methodologies, all three BiobasedCert projects assessed the relevance of several combinations of bio-based value chains. The projects jointly identified the bio-based value chains made from different types of biological resources with origins in the EU and abroad, that complement each other and that lead to a large variety of bio-based materials and products relevant to EU markets and (Table 1).

Table 1: Illustrative list of most relevant bio-based value chains for the EU^(a)

Biological resource	Bio-based material and product
Sugar crops, oil crops, used cooking oil, and other sources of fat and organic waste	Polymers such as polyurethane from butanediol and succinic acid; PLA from lactic acid; PHA from organic waste; adhesives, cosmetics, hygiene products and detergents from fatty acids; bioplastics from ethylene glycol; solvents from polypropylene glycol; packaging from polyhydroxybutyrate; and lubricants from vegetable oil and animal fat
Lignocellulosic biomass	Building material and furniture from sawn wood; particle board from fibreboard; packaging materials from wood; chemicals from tall oil; yarn from rayon; paper products from pulp; polyurethane from sawdust; and technical textiles from jute fabrics.

Other resources

Textiles from cotton and textiles from greasy wool

- (a) HARMONITOR and SUSTCERT4BIOBASED identified similarly extensive lists of bio-based product groups of interest to the EU in the building, chemical, pulp and paper, textile, waste, and wood sectors. HARMONITOR made a shortlist¹⁴ of the 35 bio-based value chains,¹⁵ and selected 16 value chains for their further analysis within the project.¹⁶ SUSTCERT4BIOBASED classified biological resources into 4 main and 22 sub-categories,¹⁷ and shortlisted¹⁸ 18 bio-based value chains.¹⁹ STAR4BBS derived value chains for four different end products from at least three different biological resources and selected 14 combinations of bio-based value chains.²⁰

To illustrate the most relevant value chains, HARMONITOR developed [interactive maps](#) that show trade flows of bio-based materials and products at different steps of the value chain within and outside the EU, and SUSTCERT4BIOBASED compiled a database of production and trade volumes for selected value chains.²¹

3.2 Selection and Assessment of Relevant Certification Schemes

There is a large number of CSLs from different sectors that are relevant to the EU bioeconomy, covering both innovative and established bio-based value chains. In general, CSLs employ third-party verification, adhere to international standards, and align with recommended guidelines such as ISO guidelines aimed at ensuring credible and consistent sustainability claims. Preliminary analyses conducted by the three BiobasedCert projects exhibit differences among CSLs concerning the scope of assurance requirements and the accreditation/oversight processes for certification bodies (CBs) and auditors. Most assurance rules are specifically outlined in CSLs' documented methodologies; however, the specifics about their governance systems are scattered around several documents or standards. These analyses also show differences in the coverage of sustainability criteria, underscoring the versatility of sustainability certifications in addressing various elements within bio-based value chains. Furthermore, challenges in accessing information on countries of origin suggest potential room for improved transparency.

BiobasedCert projects have identified, shortlisted and assessed relevant CSLs for the bioeconomy.²² Across the shortlists, the most prominent CSLs include: Better Biomass, Better Cotton, Bonsucro, FSC, ISCC Plus, REDcert, RSB, RSPO, SBP, Textile Exchange and the ecolabels Blue Angel, the EU ecolabel and Nordic Swan.²³ A summary of the most important findings from the assessments conducted so far on CSLs by the BiobasedCert projects follows:

- (i) The majority of examined CSLs demonstrate a dual focus, engaging in both business-to-business (B2B) and business-to-consumer (B2C) communication strategies, covering both commercial exchanges between companies as well as direct sales to consumers.
- (ii) Explicit requirements for bio-based products and/or components of products appear only in a small number of CSLs, except for those designed specifically for bio-based value chains.
- (iii) The geographical scope of CSLs can cause some variations in certification across different countries when they rely on minimum country-level regulations such as the national legal systems.
- (iv) Most of the assessed CSLs place considerable weight on environmental sustainability, with requirements for reducing greenhouse gas emissions, safeguarding ecosystem and biodiversity values, and emphasising responsible harvesting and farming practices. Addressing pollution reduction through eco-friendly practices, water conservation, and soil quality are also prevalent environmental topics. However, most of these requirements focus on practices and business plans, with no specific monitoring of potential impacts, posing a risk of insufficient stringency.
- (v) In relation to social requirements, many CSLs incorporate criteria related to human rights, particularly child labour prevention and the responsible employment of young workers. Prevention of discrimination and gender equality protection are also prominent aspects across CSLs. Less emphasis is placed on business ethics, supply chain integrity, employer-provided safe, clean and decent living conditions, and on the needs of rural, local and indigenous communities.

- (vi) Little weight is put on circularity requirements, which in some cases is only indirectly referenced. Responsible waste management and end-of-life recycling are the most common requirements, with CSLs demanding safe handling, minimal usage, and proper disposal of hazardous chemicals, resource efficiency or material recycling in accordance with regulations.
- (vii) Economic requirements are less prevalent. They usually encompass criteria related to economic viability, land tenure, and management planning.

3.3 Developing a Joint Monitoring System

A JMS is being collaboratively developed within the BiobasedCert cluster. The JMS will analyse sustainability CSLs intended for industrial biobased value chains and biobased materials and products, excluding food/feed, biofuels, bioenergy, and cultural/recreation sectors. The JMS aims to provide the European Commission and CSL owners with a framework to evaluate the potential of CSLs and their accompanying standards to contribute to the objectives and sustainability goals prioritized in relevant EU policies and the UN Sustainable Development Goals (SDGs). It intends to facilitate the potential harmonisation of existing CSLs in terms of shared sustainability and governance criteria.

The proposed structure of the JMS includes three levels, system, content and outcome (Figure 1):²⁴

- System – indicators focus on governance and operational requirements.
- Content – indicators focus on environmental, circularity, social and economic requirements.
- Outcome – indicators aim to capture the impact of CSLs.



Figure 1: General structure of the BiobasedCert Joint Monitoring System (JMS)

The core principles considered in the development of each level includes rigour, accessibility, efficiency, improvement, transparency, stakeholder engagement and impartiality. Key challenges in developing the JMS discussed between the three BiobasedCert teams developing the JMS include: lack of clarity on legislative requirements; feasibility of setting meaningful minimum requirements; managing continuous improvement between system objectives, and designing a JMS suitable to the diversity of CSLs.²⁵

A BiobasedCert stakeholder survey and co-creation workshop²⁶ showed that a majority of the respondents had a (moderately) positive view of the performance of CSLs and assessed their credibility²⁷ as strong or very strong (Figure 2). This paves the road for their broader use and acceptance in the EU bioeconomy. Regarding to the use of CSLs in EU co-regulation frameworks, the majority of participant stakeholders favoured making it mandatory for industry to obtain sustainability certification and labelling, and that the EU should regulate and monitor the impacts of using CSLs. As relevant concerns and risks, participant stakeholders indicated, among others, limited geographical coverage, limited coverage of some sustainability themes (e.g., biodiversity), insufficient transparency and accessibility of data reported, lack of metrics to measure performance, insufficient ambition to drive positive impact, lack of external monitoring, auditors having potential conflict of interest due to financial dependency on CSLs, and disproportionate influence of the industry in CSLs coupled with insufficient engagement of vulnerable groups, such as indigenous people.

CSL owners will also be requested to provide their suggestions and feedback on the design of the JMS. All these inputs inform the development of the three levels of the JMS.

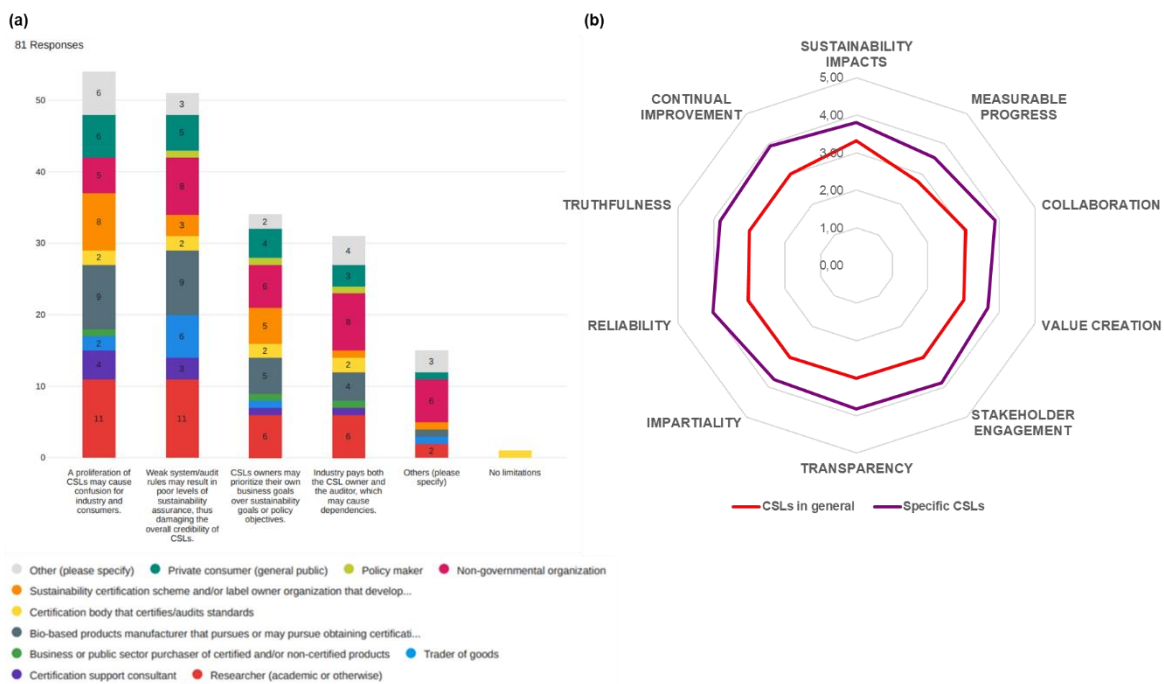


Figure 2: (a) Perceived limitations of CSLs according to various groups of stakeholders; (b) Perceived performance of General and Specific CSLs regarding the ten ISEAL credibility principles on a scale of 1-5 (1-extremely weak, 2-somewhat weak, 3-neither weak nor strong, 4-somewhat strong, and 5-extremely strong). The scores presented are based on average values.

The testing phase will look at how well indicators work when relevant certification schemes are assessed and how well these CSLs perform on those indicators. The data will be interpreted using scoring at the indicator level, attainment of proposed minimum requirements, and a roadmap aimed at CSLs' continuous improvement. The JMS will build on existing tools and databases, such as the previous research, and the ongoing research conducted by the BiobasedCert projects. The subsequent application of the JMS (and its further improvement through recommendations, additional guidance, and standardisation) will provide a baseline for the assessment of CSLs. This information could be used by CSLs to improve their robustness and effectiveness. The results of the analyses based on the JMS will be stored in an accessible database in order to ensure transparency. The JMS will provide comprehensive criteria needed for bio-based systems to be qualified as sustainable and drive continuous improvement with its accompanying roadmap.

3.4 Setup of the BiobasedCert Collaborative Platform for CSLs

Recent years have witnessed the emergence of diverse CSLs in the EU bioeconomy, serving distinct purposes and grounded in a broad spectrum of sustainability requirements and verification approaches. Furthermore, CSLs have become subject to continuous evaluations of their criteria and indicators by research projects or benchmarking activities. While several CSLs aim for continuous development and improvement (as for example those organised under the ISEAL umbrella), more effort is needed to support the cooperation amongst CSLs and their improvement by adapting best practices or results from latest research. To address this demand, the BiobasedCert cluster is developing a collaborative platform for CSLs, including, amongst others, engagement with CSLs in a roundtable format to help to identify commonalities and recognising areas for potential development and cooperation.

4. Initial Policy Recommendations

Based on findings and discussions among the projects, the BiobasedCert cluster is able to provide initial policy recommendations conducive to more robust and effective CSLs. The following recommendations can pave the way to using CSLs in EU co-regulatory frameworks that promote the market uptake of certified products:

- Clearly define sustainability ambitions for bio-based materials and products, cutting across environmental, social and economic aspects, and make sure that precise cascading and circularity concepts are part of these ambitions.
- Set concrete sustainability targets and strategies in policies governing the EU bioeconomy, leaving behind the ambiguousness in the EU Bioeconomy Strategy.
- Clarify, where possible, expected future legislative requirements for products, sectors, and CSLs and provide clear guidelines for the implementation of CSLs targeting their effectiveness and robustness and addressing sustainability and scheme management issues. This will also allow practitioners and researchers, including the BiobasedCert cluster, to future-proof minimum requirements and thresholds and better support engaged CSLs to fulfil them.
- Ensure coherence of sustainability requirements across different uses of biological resources and sectors to avoid conflicting objectives and market distortion as well as confusion on the part of producers, procurers and the public on the sustainability criteria used.
- Move away from generic approaches about increasing the use of bio-based products without ensuring the sustainability of the primary resources. Prioritise the use of bio-based products in sectors where the use of fossil-based products is significant²⁸ and where the impacts of the transition to a bioeconomy are more significant.
- As most bio-based products are only partly bio-based, implement criteria for establishing minimum sustainable bio-based content to encourage processors' use of sustainably produced renewable resources.
- Provide clarity and create awareness among manufacturers of bio-based products about sustainability ambitions, expected use phase (extension of the lifetime of a product, organic recycling and circularity practices) and expected end-of-life management.
- Support the collaborative debate across CSLs for continuous improvement initiated by the BiobasedCert cluster to achieve some level of harmonisation and coherence between legislation and CSLs. In this regard, the use and/or recognition of the BiobasedCert's JMS and collaborative platform by the European Commission would be a significant step to further harmonise CSLs, making them evolve along the dynamic EU legislative framework relevant for bio-based materials and products.

5. Conclusions and Next Steps

The ongoing research within the BiobasedCert cluster is valuable and up-to-date due to the interdisciplinary skills of the partners involved in the three projects that can leverage on their extensive knowledge of the researched topics. The design of the BiobasedCert JMS draft will be finalised, tested and validated during the second reporting period of the three projects and, where possible, integrated into the BiobasedCert platform. A thorough assessment of trade and certification levels of the most relevant bio-based value chains together with an analysis of the economic feasibility of CSLs, including quantifying and monetarising externalities, will be conducted during the second half of the projects. The BiobasedCert cluster will continue with its efforts in provisioning initial policy recommendations aimed at enhancing the robustness and effectiveness of CSLs within the EU co-regulatory frameworks, emphasizing the need for clearly defined sustainability ambitions, concrete targets, legislative clarity, coherence across sectors, prioritized use of bio-based products, implementation of governance and sustainable content criteria, and collaborative efforts for harmonisation.

Endnotes

- ¹ Harmonisation and Monitoring Platform for Certification Schemes and Labels to Advance the Sustainability of Bio-based Systems. Grant Agreement N° 101060133.
- ² Sustainable Bio-based Systems Through Effective Certification & Labelling. Grant Agreement N° 101060588.
- ³ Sustainability Certification for Biobased Systems. Grant Agreement N° 101059785.
- ⁴ ZEROPOLLUTION-01-07: International and EU sustainability certification schemes for bio-based systems.
- ⁵ Agriculture, building materials, chemicals, consumer goods, energy, food and feed, forestry, and pharmaceuticals.
- ⁶ Examples include the CAP reform, Taxonomy Regulation, Farm to Fork strategy, EU Forest Strategy, Circular Economy Action Plan, European Regulation on Sustainable products, recast of the Renewable Energy Directive, and the EU Strategy for Sustainable and Circular Textiles.
- ⁷ DBFZ and SQ Consult for HARMONITOR; NOVA and TUB for STAR4BBS, and ECOS for SUSTCERT4BIOBASED.
- ⁸ STAR-ProBio (2018), Deliverable D9.1, [Comprehensive overview of existing regulatory and voluntary frameworks on sustainability assessment](#).
- ⁹ STAR4BBS (2023), Deliverable D1.1, Report on policy sustainability targets.
- ¹⁰ Policy makers, academia and industry involvement during a co-creation workshop organised by STAR4BBS (2023), Deliverable D1.1, Report on policy sustainability targets.
- ¹¹ ECAS (2023), [Special report 17/2023: Circular economy – Slow transition by member states despite EU action](#).
- ¹² Robustness is the extent to which the assurance system of the CSL is credible. Robustness answers the question: Does the CSL deliver an accurate assessment of compliance (not prone to misinterpretation or fraud)?
- ¹³ Effectiveness is the extent to which the CSL achieves, or is expected to achieve, its objectives and bring results. Effectiveness answers the question: Is the CSL achieving its objectives?
- ¹⁴ Seven criteria considered by HARMONITOR to make the short-list of most relevant bio-based value chains for the EU are: (i) market size, (ii) representative distribution of bio-based sectors, (iii) inclusion of innovative and traditional bio-based materials and products, (iv) inclusion of residues and wastes, (v) inclusion of EU and imported feedstocks and products, (vi) value chains with environmental and social challenges, (vii) coverage by CSLs, and (viii) relevance for EU policy priorities, including: potential to contribute to food and nutrition security, sustainable management of natural resources, lower the dependence on non-renewable and/or unsustainable resources, limit and adapt to climate change, and strengthen European competitiveness and create jobs.
- ¹⁵ HARMONITOR (2022), [Deliverable D3.1 Selection of bio-based value chains](#).
- ¹⁶ HARMONITOR (2023), [Deliverable D2.1 Inventory and characterisation of identified CSLs and selection of bio-based value chains](#), see table 2.
- ¹⁷ SUSTCERT4BIOBASED (2022), Deliverable D1.1, Classification of biological resources and biobased products.
- ¹⁸ SUSTCERT4BIOBASED used multicriteria analysis based on an analytical hierarchical approach to identify most relevant bio-based value chains.
- ¹⁹ SUSTCERT4BIOBASED (2023), Deliverable D2.1, Identification of the most representative bio-based value chains.

- ²⁰ Seven criteria considered by STAR4BBS to select most representative bio-based value chains include: (i) production, volume and trade of feedstocks in the EU, (ii) inclusion of residual and end-of-life streams as feedstocks, (iii) feedstock composition and properties enabling bioconversion in biorefineries, (iv) products with a significant market share, (v) severe environmental impact of fossil-based products' counterparts (need for substitution), (vi) different end-of-life options, and (vii) connection with certification schemes. STAR4BBS (2023): Deliverable D2.1 Concept and methodology for collecting volumes of biogenic feedstock. STAR4BBS (2024): Deliverable D2.3 Report on selected test cases.
- ²¹ SUSTCERT4BIOBASED (2023), Deliverable D2.2 Database of trade volumes for biological resources and biobased products.
- ²² HARMONITOR identified 43 relevant CSLs for its 35 most relevant bio-based value chains and selected 22 of these CSLs for thorough assessment ('HARMONITOR (2023), [Deliverable D2.1 Inventory and characterisation of identified CSLs and selection of bio-based value chains](#)' and 'HARMONITOR (2023) [Deliverable D4.1 Literature review and inventory of certification schemes and labels requirements](#)'). SUSTCERT4BIOBASED identified 29 certification schemes and 9 ecolabels, and shortlisted 11 CSLs for further assessment ('SUSTCERT4BIOBASED (2023), Deliverable D1.2 Review of sustainability certification schemes and ecolabels for biobased systems'). STAR4BBS identified a long list of over 100 CSLs and shortlisted and validated with a wide variety of stakeholders 54 CSLs as highly relevant for monitoring ('STAR4BBS (2023), Deliverable D1.2 Report on existing international and EU SCS and labels for feedstock and bio-based materials and products').
- ²³ A final selection of CSLs that will be invited to participate in any or all of the cluster activities, i.e., feedback on the development of the JMS, being monitored by the JMS, joining the collaborative BiobasedCert platform.
- ²⁴ The JMS is developed jointly by three BiobasedCert projects. The content level is coordinated by SUSTCERT4BIOBASED, the system level by STAR4BBS, and the outcome level by HARMONITOR.
- ²⁵ These challenges are further discussed in 'STAR4BBS (2023), Deliverable D4.1 Concept of the monitoring system'.
- ²⁶ Survey conducted by HARMONITOR with the active support of STAR4BBS and SUSTCERT4BIOBASED ('HARMONITOR (2023), [Summary of public consultation inputs](#)'), and co-creation workshop organised by STAR4BBS
- ²⁷ Credibility of CSLs was assessed according to [ISEAL Alliance Credibility Principles](#).
- ²⁸ Sectors where the use of fossil-based alternatives are significant are such as packaging, building and construction, automotive and electrical and electronic.