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Approaches to sustainability compliance and verification for forest biomass

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Approaches to sustainability compliance and verification for forest biomass

Stefan Majer, Jinke van Dam, Uwe R. Fritsche,

Bas Heukels, Zoe M Harris, Gustaf Egnell

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1 Summary

The growing interest in the concept of the bioeconomy, including bioenergy, in many countries around the world has led to concerns about the sustainability of an increasing demand for biomass. As one of the consequences of this development, a wide range of sustainability certification schemes and labels has been developed, aiming to verify compliance with sustainability requirements in biobased value chains for bioenergy and biobased products. Furthermore, different market requirements have also developed due to differences in the requirements of policy frameworks for the various bioeconomy sectors in the EU. This has resulted in an increasing complexity in the general understanding of the meaningful and robust use of certification as an instrument in sustainability policy frameworks, and in how certification schemes relate to each other. To analyse and better understand the methodological differences between the existing approaches in demonstrating sustainability compliance, the IEA Bioenergy T45 project on "approaches to sustainability compliance and verification for forest biomass" has analysed a number of existing certification schemes regarding their compliance and verification elements. This report presents the main project findings.

The concept of compliance verification includes a range of activities to determine if a company or organisation is compliant with sustainability requirements set-up in certification schemes and standards. Activities include e.g., monitoring, inspection, data review or performing audits. Compliance verification (C&V) to demonstrate compliance with sustainability requirements is used in different contexts and through different approaches. Authorities can for example have C&V and enforcement functions in place to check compliance with certain laws. Companies use C&V to assess and demonstrate compliance, performance, and progress with respect to e.g., their internal zero-deforestation commitments. Sustainability certification is another, widely used approach. Certification means that an independent third party has assessed and certified the product to be in conformance with all the requirements of a certification scheme.

To be trustworthy, it is key that a certification scheme can provide the robustness and a certain level of assurance that criteria are indeed met. The robustness of certification schemes and the respective outcomes of their activities depends on a number of key parameters. Amongst others, those include: the governance of a certification scheme, the audits requirements including on impartiality and competency of auditors, the risk assessment approach including the geographic level or the spatial resolution for the audit, the approach for group certification activities, and the approach to trace and transfer information.

Based on interviews, workshops, and an analysis of these elements in existing schemes, the following overall conclusions can be drawn:

Risk assessment processes are a key element at all levels of the certification scheme development and application. In general, a risk assessment relates to the question of what is considered sustainable, and consequently, which sustainability risks do potentially exist for a feedstock or supply chain in a certain environment. Risk assessments and analysis are key elements in several stages of standard development and their continuous improvement. It is also an essential element in the early stages in the verification processes.

As certification is increasingly used as co-regulation instrument, it becomes more important for policy makers and regulators (as outsiders) to objectively evaluate and measure the outcomes of a risk assessment for relevant sustainability topics. Risk assessments and analysis

are, however, also partly based on stakeholder concerns and inputs. Risk identification and assessments have a certain level of s*ubjectivity*. To ensure its credibility, a risk assessment process must therefore be consistent and transparent and meet certain good practices. For example: the better a scheme describes its risk management procedures, the more transparent it is for third parties.

A second important aspect related to the risk assessment is on what geographic level sustainability is measured. For some criteria (e.g., on carbon, water) it may be more appropriate to have a regional view, while a narrower geographical scope may be more appropriate for other criteria. Factors to consider are the type of criteria being assessed, the type of monitoring and certification tools (GIS tools or household surveys) available, the level of feasibility and the risk profile (e.g., high level of deforestation or not) in the area.

Harmonization of methodologies for assessing the criteria **can help to increase comparability across schemes.** Although certification schemes can show general differences, it is important to harmonize methodologies and approaches for (newly) established criteria and indicators to increase transparency as well as comparability across schemes. This level of transparency can also help to prevent a potential race to the bottom regarding the quality in the implementation of specific requirements in certification procedures.

Transparency of a scheme is **a key element to understand** its **robustness** including its processes**.** Transparency of the data collection and transfer of data throughout the supply chain becomes increasingly important because of increased - but often unharmonized - demand of data and claims at the end of the supply chain. Transparency is therefore key to understand if data are correct and complete from the beginning till the end of the supply chain. This implies that (eligible) third parties have access and insight to these data to get oversight and to check validity.

Auditor competencies are considered as **one of the most important elements** for the robustness of the compliance and verification procedures in certification schemes and include having the appropriate skills. Having industrial expertise to be capable to assess the Chain of Custody (CoC) becomes of increased importance but is not yet a common requirement under all certification schemes. The requirement of accreditation provides a guarantee that auditors use a certain consistency in the assessment and audit conclusions reached, independently of the time, location, auditor, or certification body in question. Centralised training and exams provided by the scheme are considered very useful.

The auditor competency is important but even very skilled auditors have their limitations when the circumstances they are operating in are unfavourable. This is for example the case when the sampling or scope is not defined properly, or when auditors have not enough time. In this case, strong market competition between certification schemes may be leading, also stimulating a race to the bottom effect as auditing teams may be formed based on cost-efficiency and not necessarily based on required time and competencies.

Schemes are in a good position to **include the latest science, stakeholder concerns and policy trends**. However, there is a tension in how fast certification schemes can integrate new criteria in their standard, and the time that is realistically needed to allow for a robust standard revision cycle with strong stakeholder involvement. There is a risk when schemes are pushed too hard to improve and change all the time, companies and auditors start to lose track. There needs to be a balance in the need to respond to upcoming stakeholder concerns, the time required to integrate these during a new standard revision, and the time needed for

auditors and companies to accept and adjust to the new requirements.

Sustainability certification can be considered a meaningful and relevant tool to support the development of sustainable biomass production and sourcing if it. It can be considered as a tool which can support and drive processes to steer towards a higher level of sustainability or a continuous improvement of specific sustainability criteria in defined biomass supply chains. In most bioeconomy markets, sustainability certification is still voluntary, and market driven. The implementation of a sustainability certification alone can, however, **not guarantee sustainable biomass on its own**. Certification has e.g., limited influence on structural issues that take place beyond a company and value chain – although this may still influence the level of sustainability that is at the end achieved in the region.

As one of the elements, certification should therefore be used and integrated in a coherent and functional overall governance sustainability framework, complemented by other elements (such as national policies, laws) to assure compliance with legislation, state authorities, international agreements, and certification. The general set-up of the schemes as well as their operation is influenced and driven by a wide range of factors such as stakeholder expectations, market demand, the development of potential competitors, policy requirements, the dynamics of their internal processes, etc. In that sense, depending on the overall market and policy framework, there can be a risk for a 'race to the bottom' since the more complex and ambitious schemes, with a higher level of assurance, risk to lose market shares to less ambitious schemes with lower levels of assurance. It is the responsibility of policymakers and the sector itself to prevent this downward cycle, as it may create true risks for losing trust and reputation for guaranteeing the sustainability of a sector. There lies an opportunity for policymakers and the sector itself to optimize the use of certification, as driver of sectoral change, within the context of a coherent and functional overall governance sustainability framework.

2 Introduction

The growing interest in the concept of the bioeconomy, including bioenergy, in many countries around the world has led to concerns about the sustainability of an increasing demand for biomass. As one of the consequences of this development, a wide range of sustainability certification schemes and labels has been developed, aiming to verify compliance with sustainability criteria in biobased value chains for bioenergy and biobased products. Furthermore, due to differences in the policy frameworks of different bioeconomy sectors in the EU, also different market requirements have developed. This has resulted in an increasing complexity on the level of both the certification schemes as well as the general understanding of the meaningful and robust use of certification as an instrument in sustainability policy frameworks.

To analyse and better understand the evident methodological differences between the existing approaches in demonstrating sustainability compliance (Majer et al. 2018) and to discuss the opportunities and limitations associated with the instrument of certification in policymaking, the IEA T45 project on "approaches to sustainability compliance and verification for forest biomass" has analysed a number of existing certification schemes. This report presents the main findings from a review of compliance and verification elements in certification schemes that have been based on a broad analysis of existing literature as well as on a series of interviews with representatives from certification schemes and bodies.

2.1 SUSTAINABILITY CERTIFICATION AS A CO-REGULATION INSTRUMENT

Certification schemes and labels have become a recognised instrument by policymakers and various stakeholders from different industries to verify and communicate compliance with sustainability requirements. However, the growing diversity from the wide range of existing certification schemes for biomass as well as a growing criticism formulated by civil society about the reliance of certification to proof sustainability compliance seems to unsettle market participants and decision-makers. Thus, when discussing the question: "to what extent can certification "guarantee" a certain level of sustainability?", it is important not only to focus on the schemes alone but also on the general policy and governance background in which they are operating.

Concerns about deforestation, illegal logging, poor forest management and land rights of forest-dependent peoples - particularly in tropical timber producing countries - emerged in the mid-1980s and were supported through campaigns by NGOs and Indigenous people's organisations. In parallel with international policy debates, discussions between the forest products sector, consumers of wood products and environmental and human-rights NGOs led to the development of a non-governmental market-based approach, designed to provide a credible way of identifying well-managed forests and timber products derived from those forests while meeting the various needs and interests of actors involved (PbN 2021).

This started the development of voluntary certification, which led to the foundation of the Forest Stewardship Council (FSC) in 1993. In the next few years, competition in the field of voluntary certification emerged, mainly from national and regional initiatives, such as the Sustainable Forestry Initiative (SFI) in the USA in 1994 or the Canadian Standards Association in 1996 and the Pan-European Forest Certification (PEFC) in 1999 (Preferred by Nature 2021). The multiplication of such national or regional forest certification schemes soon brought debates over mutual recognition. Based on its success of working with European industry and stakeholders, PEFC was re-launched in 2003 as a global initiative called Programme for the

Endorsement of Forest Certification schemes; a benchmarking scheme endorsing national certification schemes also outside Europe, such as Sustainable Forestry Initiative (SFI) and the Canadian Standards Association (CSA). By 2019, 48 national schemes were supported under PEFC (Preferred by Nature 2021). While this development of certification schemes from the forestry sector was mainly driven by initiatives from NGOs and market actors, sustainability certification is increasingly also used by policymakers on the EU level as a co-regulation instrument to streamline sustainability requirements in the EU bioenergy sector.

Designing a sustainability policy framework for bioenergy at EU level is difficult since relevant environmental and socio-economic criteria to be included in these policies are also relevant for international supply chains: Supply chains for bioenergy do often include feedstocks or products that are produced outside the EU, where EU level or member state regulations do not apply. Furthermore, bioenergy products are often by-products of larger agricultural or forestry product systems (Ugarte et al. 2020). In these cases, the demonstration of compliance with regulatory sustainability criteria is more challenging and does depend on information provided by either the importer or the exporter (Ugarte et al. 2020).

A co-regulation approach makes use of private mechanisms that can freely operate internationally under public regulations (Ugarte and Swinkles 2015). In that regard, private certification schemes are used as an instrument to verify compliance with mandatory sustainability requirements in the EU bioenergy sector, mainly defined by the Renewable Energy Directive (RED II) (EC 2018). According to the inter-institutional agreement "Better Law-making" (EC 2003) co-regulation was defined as *"the mechanism whereby a community legislative act entrusts the attainment of the objectives defined by the legislative authority to parties which are recognised in the field. This mechanism may be used based on criteria defined in the legislative act to enable the legislation to be adapted to the problems and sectors concerned, to reduce the legislative burden by concentrating on essential aspects and to draw on the experience of the parties concerned".*

While the general concept sounds simple, the actual implementation can be challenging. The fact that certification schemes used under this approach can go beyond the sustainability requirements of the RED II (meaning that they can include more stringent and “ambitious” requirements) as well as the fact that the EU bioenergy sector is the only sector of the EU bioeconomy which is regulated this way, leads to a wide variety of different certification schemes and complexity as well as potential leakage and spill-over effects (such as the issue of indirect land use change).

2.2 WHAT IS CERTIFICATION?

A widely used approach for establishing credibility of sustainability compliance is through internationally recognized certification schemes. According to (ISEAL 2018), certification is defined as the issuance of a third-party statement that fulfilment of specified requirements, laid down for example in a standard, has been demonstrated. Typical, main elements of a (biomass) sustainability certification schemes can be:

- The sustainability standard
- The chain of custody
- The rules for managing the scheme (governance)

A sustainability scheme covers a set of sustainability principles/criteria, laid down in a standard. Once certified against a defined set of principles and criteria, the products from a farm or processing facility are considered "sustainable" (Stickler et al. 2018). Since, according to this approach, the production and processing of biomass must follow specific requirements, certification covers various steps in the overall value chain. The method connecting sustainability information or sustainability claims between feedstock, intermediate products and final products is known as the **Chain of Custody** (CoC). In practice, this is about implementing and verifying control mechanisms for each economic operator in the chain. Each party in the supply chain must comply with this process, otherwise, the Chain of Custody is lost.

The **management of the scheme** includes the rules that govern audits, the level of transparency and accessibility, the level of stakeholder engagement, and complaints handling. These include the rules and approaches on how to verify and demonstrate sustainability compliance and is the focus of this report. Usually, various entities are represented within one certification scheme (PbN 2021). This can include for example:

- The **Scheme owner**, who is responsible for the development, administration, and maintenance of a scheme.
- **Accreditation bodies** are tasked with accrediting other organisations (certification bodies) to deliver certification services under a predetermined set of requirements.
- **Certification bodies (CBs)** are the third-party entities that deliver certification services, principally through auditing practices. CBs usually employ individual auditors. Their role is to ensure that certificate holders conform to the applicable set of requirements whilst following the relevant procedures set by the scheme owner for CBs.
- **Certificate holders** are organisations/companies committing to conformity assessments against one or more standards.
- **Stakeholders** may play different roles within the functioning of a scheme. The development of a standard can rest entirely in the hands of the scheme owner, or it may be developed through a collective effort involving different types of stakeholders.

2.3 OBJECTIVE AND STRUCTURE OF THIS REPORT

This report presents the main findings of the IEA Bioenergy T45 project on "approaches to sustainability compliance and verification for forest biomass". The main objective of this project was to identify and describe approaches used by certification schemes to verify compliance with their sustainability requirements. The report is structured into the following chapters:

Chapter 3:	introduces the concept of compliance and verification processes in sustainability certification schemes on a general level,
Chapter 4:	introduces the main elements related to compliance and verification in sustainability certification schemes,
Chapters 5 to 9:	provides a comprehensive description of relevant compliance and verification elements related to the sustainability certification of woody biomass,
Chapter 10:	of the report describes trends and potential future developments for compliance and verification elements,
Chapter 11:	provides conclusions and recommendations.

2.4 APPROACH AND METHODOLOGY

This report presents the main findings from a review of compliance and verification elements in a number of selected certification schemes. The work has been based on an analysis of existing literature as well as on a series of interviews and workshops with representatives from selected certification schemes and certification bodies. The interviews have been conducted based on a standardised questionnaire to allow for higher comparability of the interview results. The analysis was focused on certification schemes for forestry biomass, with a specific emphasis on the following schemes: International Sustainability and Carbon Certification (ISCC), Forest Stewardship Council (FSC), Programme for the Endorsement of Forest Certification (PEFC), Roundtable on Sustainable Biomaterials (RSB) and Sustainable Biomass Program (SBP).

In addition to the review of available literature, a series of 11 interviews have been conducted to discuss specific aspects of the literature analysis in more detail with experts and to collect additional input. Two project workshops were organised to deepen the discussion and to confirm some of the project's main findings.

3 On the general concepts of compliance and verification in certification schemes

A system (i.e., policies, norms, standards) to control, monitor, and verify compliance with sustainability or product these requirements is essential for companies, standards, and policies to assess their performance and is critical for providing credible information on performance and progress to buyers and other stakeholders.

The concept of **compliance verification (C&V)** allows for a monitoring, inspection, data review, audits, or other activities to determine if a company or organisation is compliant with certain defined (sustainability) requirements. The Accountability Framework Initiative (AFI 2020) refers to the term 'monitoring and verification' (M&V) as an "iterative, ongoing process that companies use to assess and demonstrate compliance, performance, and progress with respect to their supply chain commitments". Monitoring data and other information sources are used as input to the verification process (AFI 2019a).

Fulfilment and compliance with certain (sustainability) requirements can be demonstrated through different approaches. Authorities can have C&V and enforcement functions in place to check compliance with certain laws. Companies use monitoring and verification to assess and demonstrate compliance, performance, and progress with respect to, for example, zero-deforestation commitments. Sustainability certification is another, widely used approach.

Certification means that an independent third party has assessed and certified the product to be in conformance with all the requirements of the standard. The standard of a voluntary certification scheme could also internalise requirements from policy frameworks such as for example the Renewable Energy Directive. Compliance with the requirements is usually checked by an independent third party, i.e., a certification body.

An essential difference between certification and other verification approaches (such as checking compliance with a legal norm) is that certification demonstrates compliance "before the fact" and other verification approaches "after the fact". With certification, a product or company gets certified and, until the next audit proves otherwise, the product may be claimed and sold as sustainable (product certification) or the company may sell its products as sustainable (sustainability claims on company level).

To be trusted, sustainability certification schemes need to show that they can effectively identify and address the real issues that businesses, governments, and consumers care about. Within certification, this is also referred to as a **robust or credible assurance level**, i.e., the degree of confidence a standard can provide that its criteria are indeed met (IUCN 2019). **Assurance** is defined by (ISEAL 2018) as demonstrative evidence that specified requirements relating to e.g., a product, or process system, are fulfilled.

3.1 BEST PRACTICE REFERENCES FOR ROBUST CERTIFICATION SCHEMES

Various reference frameworks are developed that lay down key principles for robust and credible sustainability certification schemes, amongst others by ISEAL, the Accountability Framework initiative and by ISO.

ISEAL is the global membership organisation for ambitious, collaborative, and transparent sustainability schemes[1]. ISEAL's Credibility principles (see Figure 1) define the core values of credible and effective sustainability schemes. The principle on impartiality states for example that: *"a credible sustainability scheme identifies and avoids or mitigates conflicts of interest throughout its governance and operations, particularly when it comes to assessing its users' performance. Transparency and stakeholder engagement help ensure the scheme's integrity can be trusted".*

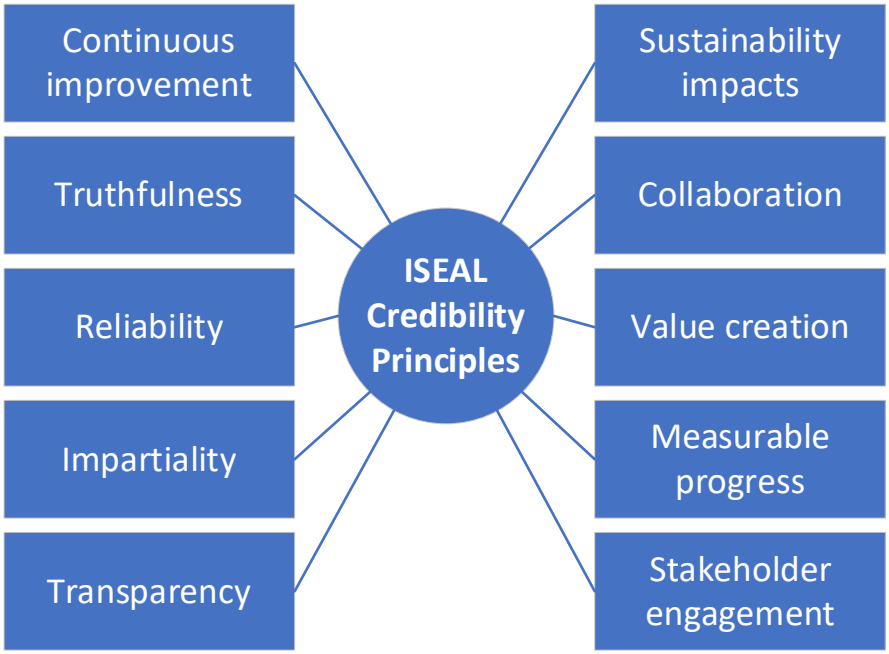

Figure 1 The ISEAL credibility Principles with core values for credible and effective sustainability systems based on (ISEAL 2021)

The Accountability Framework Initiative (AFI) is led by a diverse civil society coalition and is a collaborative effort to build and scale up ethical supply chains for agricultural and forestry products. The Accountability Framework itself includes 12 Core Principles, which serve as guide for companies and others in setting, implementing, and monitoring effective commitments on deforestation, ecosystem conversion, and human rights in ethical supply chains. Various operational guidance documents are developed, including for monitoring and

[1] ISEAL defines credible practice for sustainability standards and similar schemes through Codes of Good Practice and guidance materials, see: www.iseal.org.

verification, supply chain management, on reporting and on disclosure, and claims (AFI 2022).

ISO is an international standard development organisation composed of representatives from national standards organisations of member countries. ISO standards used for accreditation of certification bodies can be a useful reference for further harmonisation and setting minimum requirements. Examples are ISO/EC 17065[2] or ISO 19011[3]. The ISO 22095 standard defines a framework for the chain of custody (ISO 2022).

3.2 C&V REQUIREMENTS FOR BIOENERGY CERTIFICATION SCHEMES AS LAID DOWN IN POLICY FRAMEWORKS

To prove compliance with sustainability criteria, policy frameworks can make use of certification or verification – or a combination of both (see chapter 1). Linked to that, policy frameworks can further define *how* those sustainability criteria should be verified and assured. When policy frameworks have included those verification and assurance requirements (as is the case of EU RED II), certification schemes must also comply with those for approval.

3.2.1 C&V requirements for bioenergy certification schemes from EU regulations

Requirements for auditing, compliance and verification were originally very generally defined in the first version of the EU RED (EC 2009). This lack of requirements on assurance has raised concerns, as can for example be seen in a report from the Netherlands (NL Agency 2012). Amongst others due to these concerns, assurance requirements have increasingly received more attention in the EU RED II, mainly laid down in article 30 of the Regulation.

Recently the European Commission approved the implementing regulation on "rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria" (EC 2021). This regulation aims to strengthen and further harmonise rules on verification and compliance amongst RED II recognized certification schemes. The Regulation sets, amongst others, rules on how certification schemes must deal with non-conformities; on the audit process; on required levels of assurance, accreditation, or on auditor competencies. Some of the relevant C&V requirements (*a selection!*) in the RED II and the recent Implementing Regulation include (EC 2021):

- Voluntary schemes must set up rules and procedures to avoid conflicts of interest in decision-making.
- In the preparation of the initial on-site audit as well as during subsequent surveillance or re-certification audits, the auditor should make an appropriate analysis of the overall risk profile of economic operators.
- The rules on auditor competencies define the required skills for conducting audits in relation to some specific sustainability criteria, such as experience in mass balance systems or experience in auditing GHG emission calculations.
- The Implementing regulation (EC 2021) requires the accreditation of CBs and their

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2 Setting requirements for bodies certifying products, processes, and services

3 Guidance on auditing management systems, including the principles of auditing, managing an audit programme and conducting management system audits, as well as guidance on the evaluation of competence of individuals involved in the audit process.

auditors. CBs that lose accreditation can no longer be recognized by certification schemes approved under the RED II.

Within the RED II governance framework, supervision relates to the monitoring of economic operators, CBs (and their auditors) and certification schemes. According to the implementing regulation, voluntary schemes must require their economic operators participating in the certification scheme to cooperate with the European Commission and the competent authorities.

3.2.2 C&V requirements to assure the sustainability of bioenergy from other policies

It is important to recognize that not all bioenergy policy frameworks make use of certification schemes to prove compliance with the sustainability criteria. For example, the Low Carbon Fuel Standard (LCFS) in California is built on a third-party verification program (thus one system is used for the verification), providing an independent, and documented process for evaluation of reported data against the LCFS regulatory requirements and methods for calculation. Requirements for the qualifications of the verifiers are part of the verification program.

The standard CSA W209 provides a framework for market actors in the Canadian bioeconomy sector, to the complexity of life cycle risks in the sourcing of biomass. Another example are the requirements for operators producing, procuring, and importing biomass under Japan`s Feed in Tariff. A number of recognised certification schemes can be used by market actors to show compliance with these requirements. Next to that, it is also important to realize that (some) compliance and verification requirements may be fully missing in other sustainability policy frameworks for the bioeconomy (compare also van Dam and Ugarte 2022).

Finally, it is important to realise that in some other countries, and for some other sectors in the bioeconomy, sustainability policies in place are not (yet) in place at all.

To consider this necessary differentiation between the general policy framework for sustainability (and the role of certification as a co-regulation instrument within this framework) and the robustness of the instrument certification itself, this first part of this report focuses on “internal” elements for the verification of compliance with sustainability requirements.

4 Main aspects related to the C&V elements in sustainability certification

Following the general introduction of elements for C&V in Chapter 2, this section provides an overview of the main internal and external parameters that influence the elements of C&V processes in sustainability certification, and how they are – or can be - internally organised.

The C&V elements introduced in this chapter will be described and discussed in a greater level of detail in Chapters 4 – 8.

4.1 CERTIFICATION OPERATING IN REGULATORY AND VOLUNTARY MARKETS: THE EXAMPLE OF WOOD BIOMASS

While the general concept of verification and proof of compliance is the same in most of the existing certification schemes for forestry biomass, they also show differences in requirements and procedures when looking more in detail: Each forest-related certification scheme has its own set of requirements; discrete set of certifications- and accreditation procedures, differing approaches to quality assurance and a varying degree of transparency (PbN 2021). The main reason for this is that certification schemes are typically being developed to operate under specific market frameworks that are largely influenced by the policy framework in the region of operation, as well as by stakeholder and market expectations which are important regarding the market acceptance and relevance of the schemes.

On a general level, and for the schemes analysed for this report, differences regarding the general topics that are reflected in the sustainability criteria of the selected schemes are rather small. Schemes such as the Sustainable Forestry Initiative (SFI), PEFC, FSC and SBP share the same main principles for key sustainability criteria. Also, the general approach to the verification of their sustainability requirements between these schemes is comparable. Furthermore, in several regions such as North America and Europe, schemes like SFI, FSC and PEFC do share the same pool of auditors and certification bodies; an essential element for the general process of verification and compliance.

Due to the importance of the policy framework, a general difference can be noted between schemes operating in regulated and in voluntary markets. Schemes operating under policy frameworks such as the EU RED (e.g., ISCC, SBP, RSB) or other similar legislation have to follow the requirements defined in these frameworks to get approval and become recognised by the policy framework (e.g., under the RED by recognition through the EU Commission and/or member states). Once recognised, these schemes can be used by market actors to show compliance with the RED requirements. This means implicitly that the recognised schemes are also in direct competition with each other; since there is not necessarily a clear benefit for market actors to work with more advanced or ambitious schemes; This results in a risk that complex, or more ambitious schemes have a lower market relevance.

This is different for schemes operating in markets where no legislative sustainability framework exists (yet). Schemes such as FSC and PEFC focus strongly on the voluntary market for timber products and have a different origin. For example, FSC started the development of its standard from an international perspective, with a key focus on tropical timber producing countries, while SFI is specifically developed for the US and Canadian context, which can rely on a strong legal framework.

During the analysis of selected certification schemes and the interviews conducted for this report, the following topics could be identified as main reasons for differences between schemes:

First, schemes show differences in specific audit procedures and the type of indicators used to proof compliance with the criteria of the scheme. The RED II policy framework does provide general sustainability requirements for bioenergy producers, which need to be fulfilled in order to account for the specific energy carrier towards the national targets for the development of renewable energies. Some schemes do, however, require further specification and operationalisation from a producer to understand whether this producer is compliant with the criteria. These specifications of the general requirements are included in standard documents of the certification scheme. They provide amongst others the guidelines for the verification process in practice (e.g., the auditor checklist). The further specification of overarching requirements into scheme procedures and guidelines can result in differences between schemes, and specifically to deviations in audit procedures or in the type of indicators that are being checked during the actual audit process. This also explains differences regarding the **clarity and ease of comprehension of indicators and verification procedures.**

A second point leading to differences in verification of compliance requirements between certification schemes is the geographical area that is covered during an audit to proof compliance with the certification requirements. Several of the interviewees mentioned differences between the certification schemes regarding the size of the **geographical area involved in different steps of the risk assessment and auditing during certification.** Examples are audits and risk assessments on forest unit levels, sourcing area, landscape level, or a combination of them. It is important to understand that a decision on the size of geographical area covered during an audit is a function of various parameters that are taken into consideration, such as, for example, costs, data availability, the overall risk associated with the CoC elements, etc. This is further explained in chapter 6.1.

Besides the fulfilment of mandatory requirements, the communication of specific product characteristics (e.g., 'deforestation-free' or sourced in a forest that is sustainably managed) to the public, or to specific buyers, is often an important motivation for stakeholders to get certified. Thus, claims associated with a sustainability certification are important elements, also for the selection of schemes by market actors. In general, differences exist between certification schemes regarding the **transparency of the claims that are made throughout the supply chain**. Further, in case the claim cannot be linked to a physical property (you cannot see something is sustainable) the reliability solely depends on the quality of the certification. Chapter 5.3.4 further explains aspect of transparency. In addition, there are differences related to the robustness of the information transfer through the supply chain, to the end-user, as well as in the **cross-recognition of other schemes** (compare chapter 8.2.1).

4.2 INTERNAL ELEMENTS INFLUENCING THE ROBUSTNESS OF C&V

One of the main objectives of sustainability certification is to establish a framework under which an independent and robust verification of compliance with defined requirements (i.e., as defined in a standard) is possible. In that sense, the scheme specific approach to compliance and verification processes is defined by several internal elements on different levels of the certification schemes, which are also partly interconnected.

In this report, we review these elements as a starting point to better understand how a certification scheme organises C&V elements, and to assess the potential robustness of this approach. Existing sustainability certification schemes for woody biomass differ partly with regards to the principles, criteria and indicators included in their standards. A direct comparison of these requirements can provide an overview on the range of topics, set by the schemes. Furthermore, on a second level, the actual implementation of the respective criteria and indicators as well as the underlying methodologies and data required to proof compliance can be different between existing schemes. Based on a review of literature and a series of interviews and workshops conducted for this project, we have identified a number of relevant internal elements, potentially influencing the robustness of C&V in certification schemes. These are:

- The **governance of a certification scheme** and the way certification schemes organise stakeholder involvement, necessary standard revisions as well as potential appeals and complaints that are brought forward.
- The **requirements and procedures for audits** as an essential element for C&V processes, including for example procedures around (non-) compliance with the standard requirements, and the documentation and proof of the audit performance and its development over time (i.e., continuous improvement).
- The approach for **risk assessment** as a first step to assess and define potential risk areas and appropriate measures such as the audit intensity and the necessary type of the audit.
- The **geographic level or the spatial resolution for the audit, the respective** collection as well as the assessment and monitoring of risks.
- The **methodologies, tools and underlying guidance elements to assess the different criteria and indicators of the scheme**. This includes aspects such as the clarity of the criteria implementation and the rules for their assessment (e.g., the calculation of GHG emission thresholds), existing tools to support audits (e.g., remote sensing tools, GHG emission calculators, etc.), the consideration of existing national or regional policies and legislations as potential proxies or the way uncertainties related to specific criteria and their methodologies are being handled.
- The clustering of producer groups with similar processes and/or similar regional characteristics in **group certification** activities to reduce the potential effort for individual market actors.
- The internal guidelines and procedures to ensure the **impartiality and competency** of the independent auditors, which are accredited by the certification schemes.
- The approach of certification schemes to **trace and transfer information** is relevant to verify compliance with the defined requirements throughout the supply chain, and to establish a robust claim associated with the sustainability characteristics of a biobased product.

The following chapters 4 - 8 will describe and discuss some of these elements in more detail.

4.3 THE SCOPE OF CERTIFICATION: ITS POTENTIAL AND LIMITATIONS

Sustainability certification aims to address several pressing, and relevant sustainability issues. The topics which are directly addressed by certification schemes can be defined by the stakeholders driving the schemes development and/or by existing policy requirements in place. In that sense, the sustainability requirements laid down in certification schemes, ideally complement and go beyond legislation. In several certification schemes, legal compliance is one of the requirements.

During the interviews conducted for this report, several participants referred to sustainability certification as a meaningful and relevant tool when it indeed complements a coherent and functional governance framework. Meaning that the overall framework to ensure a certain level of sustainability for biomass should consist of different elements to assure compliance with legislation, state authorities, international agreements, sector and certification requirements. Certification is a tool which can support and drive a process of development towards a higher level of sustainability, for example on the level of an individual producer. However, certification, which is in most cases voluntary and often market driven, cannot be expected to deliver sustainability on its own.

Furthermore, the introduction of specific sustainability requirements which are only considered by a limited number of producers and/or sectors of the bioeconomy can shift risks and problems to other sectors, that do not have mandatory sustainability requirements (e.g., food and feed sector). For example, the debate of indirect land use change effects from the introduction of incentives for biofuels has also shown that the tool of sustainability certification cannot alone provide solutions to overcome these problems, especially as they take place on a more structural, global level beyond the value chain.

Certification is a meaningful tool. It rewards companies towards sustainable practices and can help to steer supply chain processes towards more sustainability – especially when the certification scheme is used at scale. Herewith, it is important to realise that an economic operator can steer its own company processes (e.g., waste management, environmental care) towards more sustainable practices, but that he has limited influence on structural issues that take place beyond its company – although they still influence the sustainability impact that is at the end achieved in the region. Examples for this are poverty, indirect land use changes (iLUC), deforestation or weak land use planning. Therefore, in the case of iLUC it is important to identify criteria on a company level for (in that case) low iLUC practice, that could be covered by certification. At the same time, it is important that certification efforts for these more structural issues are integrated and addressed in more scalable approaches (e.g., government policies, landscape approaches) that move beyond the level of individual producers and projects.

5 Focusing on a specific C&V aspect related to sustainability certification of woody biomass: scheme governance

The following chapters will focus on specific C&V elements in order to describe and discuss them in greater detail. The first aspect is the role of 'scheme governance' as one of the key compliances and verification aspects (and as such identified during the interviews) related to the sustainability certification of woody biomass.

The governance structure of a scheme is crucial for the overall integrity and the functionality of a certification scheme. One of the key challenges is to balance between the establishment of robust and transparent procedures for the continuous operation of the scheme on one hand, and the flexibility to adapt to new and necessary developments on the other hand.

One key element of scheme governance is that the scheme owner is economically independent from the certificate holder to ensure its impartiality in decision-making (ITC 2020). Scheme governance touches also upon a broad range of other issues. Existing certification schemes can vary strongly in their governance designs and the ways in which they apply inclusiveness, transparency, internal management procedures or grievance procedures.

5.1 ENSURING INCLUSIVENESS: STAKEHOLDER INVOLVEMENT AND REPRESENTATION

According to (PbN 2021), schemes can range in the level to which stakeholders are able to influence, participate in, or support standard setting processes.

To ensure the robustness of a scheme, it is, however, important that the standard organisation is accountable to its stakeholders and meaningfully involves them in decisions that will affect them (ISEAL 2020). This also means that certification schemes should have a broad range of representatives in their governance structure and decision-making from various relevant stakeholder groups (EC 2021).

One example of this are the three stakeholder chambers from the Forest Stewardship Council (FSC), representing environmental, social, and economic interests, with equal participation from organisations from the global north and south (Schleifer 2018).

It is also important that there is balanced decision-making (ITC 2020) and that no individual stakeholder or stakeholder group has a dominant position in the decision-making process. Therefore, decisions should only be taken where a quorum of the majority of stakeholders is reached, and schemes must have rules and procedures to avoid conflicts of interest in decision-making (EC 2021). This also means that the standard organisation should have an internal structure in place that allows to process the stakeholder feedback and makes particular efforts to engage disadvantaged stakeholders and has fair mechanisms for resolving conflicts (ISEAL 2020).

5.1.1 Room for dialogue on (societal) concerns

It is noteworthy that a broad multi-stakeholder representation in a certification scheme also provides room for dialogue and discussion to understand concerns, and how sustainability risks may change over time – which feeds into the issue of standard revisions (see 5.1.1).

This same multi-stakeholder representation may also provide a platform for discussing broader societal concerns. Examples are discussions around an appropriate geographic scale for evaluating maintenance of forest carbon. There are, however, limitations: although it is important to reach societal consensus in this, these issues go beyond the scope of certification. Here, also other stakeholders outside the certification schemes (e.g., scientists, governments) have their role to play.

5.2 ROBUSTNESS OF STANDARD REVISIONS: CONTINUOUS IMPROVEMENT AND ADAPTING TO NEW CHALLENGES

According to (PbN 2021), schemes differ in their approaches to standard setting and the level of transparency that comprises the standard-setting process.

A regular revision of standards is needed to ensure their continuous improvement. (ITC 2020) recommends that a standard is reviewed and, if necessary, revised at least every 5 years. In practice, this means that standard organisations have, after each period, an intense revision process to ensure that the necessary inputs and feedback is collected, reviewed, and agreed upon.

Schemes have regular revision processes, and it is considered best practice to include inputs and feedback from:

- Stakeholders, i.e., from standard members and partners, on how to improve the standards (see 5.1.1).
- The latest technology and knowledge from science.
- Policy trends, by monitoring sustainability policies and governance to prepare the implementation of these policies into the standards.
- Insights in changing market demands and societal concerns and risks.
- Next to that, it is important that a scheme has a long-term strategy in place on how to realize impact and for meeting its sustainability-oriented objectives (ITC 2020).

For SFI, it is for example a critical part of the standard revision to include / consider new criteria and indicators through a robust revision process (collecting public input, including the latest insights and science). For SFI, this has resulted in new objectives in forest management, including climate smart forestry in the updated standard (as mentioned during the second project workshop). It is important to note that both risks but also market demands are changing over time and require a certain flexibility from certification schemes to adapt. This includes development processes on all levels of the certification scheme. Some schemes do have an oversight mechanism (for accreditation, audits, certification) to annually evaluate results of audits. Furthermore, new topics (e.g., synthetic fuels derived from “green” hydrogen) are taken up in working groups to analyse existing regulation, possible loopholes/deficits, and possible action needed (for the example RSB).

5.2.1 Changing policy environments: the need for harmonisation

Changes in requirements in sustainability policy frameworks can have consequences for certification schemes because they need to adapt. At the same time, policy frameworks such as the RED and REDII also need a constant reflection of their criteria, e.g., whether social criteria should be included (mentioned during one of the interviews).

Changes in policy requirements can also lead to inefficiencies, especially when requirements become too prescriptive and/or differ between policy frameworks. Although policy frameworks will change over time, this does plead for a harmonisation between existing country and/or sectoral policy frameworks.

5.2.2 A balance between robust standard revision and taking up new concerns

Certification schemes are in a good position to include / consider the latest insights and science into their standard: they have regular stakeholder consultations and standard revision cycles (see also 5.1.1). At the same time, there may be a tension in how fast certification schemes can integrate new criteria in their standard, and the time that is realistically needed to allow for a robust standard revision cycle with strong stakeholder involvement.

Robust standard revisions require a broad range of stakeholders, consultations, finding consensus etc. This robust revision may limit the flexibility in a scheme to quickly integrate new societal concerns or policy requirements (e.g., from the EU RED II) because it takes time to include them in the standard revision cycle and reach consensus on it.

5.3 INTERNAL MONITORING, COMPLAINTS PROCEDURE AND DOCUMENTATION MANAGEMENT SYSTEM

It is considered best practice that certification schemes have an internal monitoring, complaints procedure and documentation management system in place, and that they make important information publicly available and easily accessible to stakeholders (ITC 2020; EC 2021; ISEAL 2021).

5.3.1 Internal quality management

Certification schemes need an internal quality management system, amongst others to verify compliance of economic operators with the rules and procedures applied by the scheme. This internal monitoring system is also a quality check, for example on the work carried out by the auditors of the certification bodies (EC 2021). The results of the internal monitoring can be used, if needed, for corrective actions but can also be used as input for the standard revision.

5.3.2 Procedures to handle appeals and complaints

A good scheme should also have detailed and consistently implemented procedures to handle appeals and complaints (EC 2021; PbN 2021).

Appeals refer to the possibility for the (applicant) certificate holder to obtain the reconsideration of a certification decision taken by the certification body (PbN 2021). A complaints procedure refers to permitting the expression of dissatisfaction over the functioning of a scheme, scheme-related entities (certification body, accreditation body) or scheme participant/certificate holder (PbN 2021).

5.3.3 Documentation management system

One of ISEAL's credibility principles is that schemes should have a consistent and documented system in place that lays down the requirements for implementation of its assurance system (ISEAL 2020). It is therefore important that certification schemes - and their certification bodies – have a documentation management system in place that includes amongst others the general management system documentation (e.g., manuals, policies, definition of responsibilities), procedures for identification and management of non-conformities (EC 2021).

5.3.4 Transparency

Transparency helps foster external review or scrutiny of verification processes. This may be achieved through robust policies and practices for stakeholder engagement, managing grievances or public disclosure of information (AFI 2019b).

One of the ISEAL Credibility principles is therefore that the organisation makes important information publicly available and easily accessible to its stakeholders; to support users and stakeholders to understand and evaluate the scheme and its impacts, providing them the information they need to engage (ISEAL 2020). Transparency should include *public disclosure of auditing reports, transparency at all stages, and openness*[4] (Burkhardt D. 2020).

[4] The European Parliament indicated in its recommendations to the Commission on an EU legal framework to 'halt and reverse EU-driven global deforestation' that third-party certification schemes can complement and inform

6 Focusing on a specific C&V aspect related to sustainability certification of woody biomass: robust and clear audit processes and risk assessment procedures

In this section, we focus on the importance of robust and clear audit processes and risk assessment procedures to ensure the correctness and completeness of data which are needed to proof compliance of the sustainability requirements. This is identified as one of the key compliance and verification aspects during the interviews related to the sustainability certification of woody biomass.

Certification schemes usually set rules on how audits should be conducted, which certification bodies are typically required to apply (PbN 2021). Based on the conclusion of an audit, a recommendation will be made on whether to award or maintain the certification. A certificate will usually have a fixed period of validity, with five years being the norm, after which the certificate would need to be renewed. Renewal of a certificate will usually entail a full assessment of the certificate's holder compliance with the applicable standards (PbN 2021).

Clarity and specificity (or lack thereof) of the certification scheme and audit scope can lead to better (or lack of) consistency in auditing and risk assessment procedures and may greatly impact the performance of auditors regardless of their competencies (mentioned during the second project workshop 2022).

Certification schemes shall have clear procedures in place about the audit processes, and about the sequence of audits, including rules about:

- The requirements that economic operators successfully pass an initial audit before allowing them to participate in the scheme (EC 2021).
- Sequence of, and maximum time intervals, between initial audit, re-certification, and surveillance audits.
- Detailed procedures setting out how audits are planned (i.e., a verification plan) and conducted, how risks are defined, and how audit reports are drawn up (EC 2021).
- Levels of assurance.

6.1 CREDIBLE RISK ASSESSMENTS

Risk is defined by (ISEAL 2018) as the chance of something happening that will have an impact on objectives. It is measured in terms of a combination of the probability of an event and the severity of its consequences. Risk mitigation are the actions taken to lessen the probability, negative consequences, or both, associated with a risk (ISEAL 2018).

A risk assessment and analysis focus on gathering information from different sources to assess the relative risk that a problem will occur. That probability, along with the severity of the consequences if the event does occur, should inform the rigour and intensity of the

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the risk assessment and mitigation components of due diligence systems, provided that these schemes meet certain of governance. These should include public disclosure of auditing reports, transparency at all stages, and openness (Burkhardt 2020).

monitoring (Mallet et al. 2019). Credible risk assessments are of importance as they define at the end whether, for example, a region is characterised as having a low or high risk, and herewith the intensity of (external) monitoring.

Thus, the general organisation of the risk assessment and the competencies of the involved auditors are crucial factors for the robustness of a scheme.

Next to that, risk profiles and assessments are also becoming increasingly important as a tool to improve the effectiveness of assurance, by correlating data collection intensity to where risks are highest (Mallet et al. 2019).

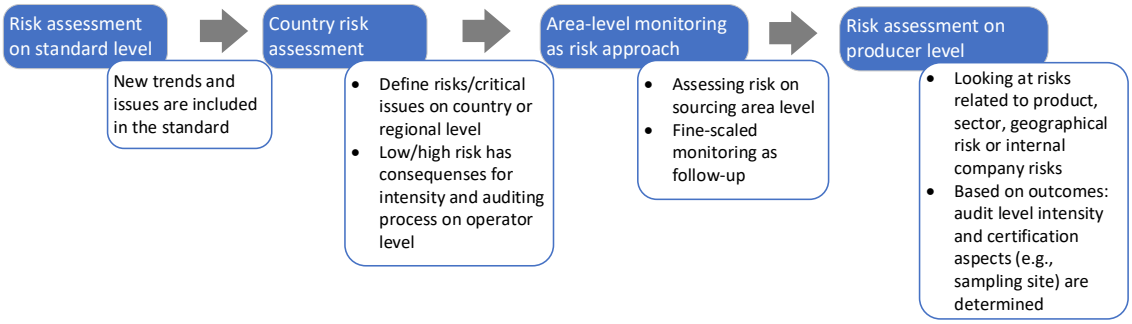

Figure 2 exemplary risk assessment process (own figure)

6.1.1 Different geographical levels of risk assessment: country, area, company level

Risk assessments happen at different levels in the verification process; for example, on standard level (see 5.2), on country level, on sourcing area level, when auditors define risk on company level, and when certified operators make their own risk assessment (as mentioned in the second project workshop 2022).

A risk assessment on producer or company level is often the first step for the third-party auditor/certification body to understand potential risks in relation to the scheme principles for a specific region or a producer. The risk assessments on country or on sourcing area level are mainly used to assess geographical risks; and to identify (for each criterium) whether the area has a low, standard, or high risk.

6.1.1.1 Country risk assessments

Various certification schemes use country risk assessments to assess the level of risk for sourcing material from unacceptable or non-sustainable sources in a given country. Examples are the FSC National Risk Assessment for controlled wood or the regional risk assessments from SBP.

Other schemes (e.g., ISCC) work with regional and technical stakeholder committees to better understand regional risks. These stakeholder processes need to be organized and moderated.

6.1.1.2 Area-level monitoring as company's risk assessment

Area-level monitoring does not provide precise information about specific production units of origin but determines the risk within a given (sourcing) area. Therefore, this approach has limitations to assess or demonstrate compliance with supply chain commitments or to track progress with a high degree of accuracy (AFI 2019b). Companies may use area-level monitoring as a methodology for assessing risk within the company's sourcing origins located within a given area. If area-level monitoring determines that there is low-risk of non-compliance within the entire area, then more fine-scaled monitoring may be unnecessary. However, if area-level monitoring identifies non-compliance for a given criteria or commitment, then the company's supply-base within that area would not be considered low-risk and more monitoring would be needed to assess the level of compliance more precisely (AFI 2019a).

6.1.1.3 Risk assessments on producer & company level

The risk assessment on producer or company level is in essence used to contextualise the information from the company to be able to focus on the relevant issues during an audit (discussed during the second project workshop 2022). (Proforest 2017) distinguishes three types of risk, i.e.:

1. a risk related to the product, species or sector (e.g., large use of chemicals during production);
2. risk related to the geographical area where the commodity is produced or sourced (e.g., is there a region with water shortage?) and
3. risk related to the individual producer or certificate holder, e.g., lack of an environmental policy, for example, or the fact that a factory employs subcontractors.

A verification plan should correspond to this risk analysis and the scope and complexity of the economic operator's activities (EC 2021). Based on the outcome of a risk assessment, the audit level intensity as well as the focus for the specific certification process is determined. For example, the risk assessment determines:

- The audit scope, or both; this shall be adapted to the level of overall risk identified (EC 2021). Most schemes have a long list of criteria and indicators, but auditors are at the end not expected to look at all those indicators on the farm but to focus on those that matter most (mentioned during the second project workshop, 2022).
- The frequency of certification audits.
- The nature of the certification audit(s): Different types of assessment are carried out by certification bodies. They can include pre-assessments, full audits, surveillance audits, on-site audits, document reviews, external group or multi-site audits, unannounced audits, witness audits, parallel audits, remote audits, etc. (ISEAL 2018).
- The sampling procedure[5], i.e. the size and nature of the sample of producers for

[5] If monitoring is to be based on a sample of locations, production units, or groups, this sampling should be selected according to good practices, such as (Accountability Framework Initiative 2019): (i) the sample size should be determined by the level of precision and confidence desired (the larger the sample yields greater precision and confidence in the results); the degree of variability in the topic being monitored and the size of the effect to be identified (smaller effects necessitate larger sample sizes); (ii) a stratified sampling approach should be used to help ensure that all key groups or land types are included within the sample; (iii) the sample

certification audits (Proforest 2017). Sampling procedures define the basis on which auditors will determine what to look at during the auditing assessment, e.g., the most common problematic issues, the issues with the highest risk, etc. (ISEAL 2018; AFI 2019b).

- The audit intensity: A credible verification process includes an adequate audit intensity (including the number of auditors and audit days) for verifying compliance, as well as a justification of the audit intensity (AFI 2019b).

When it comes to the implementation of the risk assessment procedures, the competency of the auditor is very important.

6.1.2 What is a high or low risk? Ensuring credibility of determining risk

Risk categorizations are generally based on probability and consequence: when an event can occur frequently and impacts are critical or catastrophic, the risk is clearly considered high. Where either probability or consequence is unknown, (Mallet et al. 2019) recommend that the precautionary principle should be followed.

6.1.2.1 Desired geographical level for verification and risk assessment

The risk assessment and management are important first steps to understand the necessary geographical scope for an audit and verification, as this much depends on the context. It is considered meaningful to differentiate the discussion of risks according to the specific criterium (e.g., biodiversity or human rights) as well as to the region in which the audit takes place. What also matters are the sizes of the production units (e.g., the forest management Units) in the region and how fragmented they are. For some criteria (e.g., carbon, water) it may be more appropriate to have a regional view, while a narrower geographical scope may be more appropriate for other criteria. for other criteria. (Mallet et al. 2019) mentions four main factors that influence the appropriate scale for a (risk) monitoring approach:

- First, the type of issue (e.g., child labour or halting deforestation) being assessed. The type of issue informs how the other three factors are considered.
- What assessment methodologies or monitoring tools (e.g., household survey or satellite imagery) are available for this issue.
- Feasibility: At what scale does it make sense to measure the issue? e.g., deforestation is most meaningfully measured at a landscape scale; child labour is most often measured at an enterprise level.
- What is the risk profile of that issue in that place? Where there is a greater risk of poor performance in a region or where other risk characteristics exist (e.g., corruption), the frequency and intensity of assurance will increase.

When monitoring risk on a larger geographical area, it is important to take into consideration that some producers with high-risk practices might not be identified when they are in a low-risk geographical area or supply low-risk products (Proforest 2017). (AFI 2019b) therefore recommends encouraging companies to pursue further traceability and more effective verification control mechanisms to move towards monitoring of the specific production units and processing facilities of origin, except where area-based monitoring reveals low-risk of

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should include unique, sensitive, or important features, such as high conservation values (HCVs), areas where conflict is known to occur, etc.

non-compliances relative to a given commitment or criterium across the entire area. Another point to be taken into consideration is which risk level is considered acceptable in relation with the efficiency / administrative burden of stricter verification and auditing controls. There is at some point a crossover where the added effort to mitigate risk becomes negligible, while costs may become too much of a burden.

6.1.2.2 Ensuring a credible risk assessment

Risk identification and assessments have a certain level of s*ubjectivity*. They may vary based on what information is used to inform a risk categorization, who carries out the assessment, how risks are characterized and the implications for the monitoring methodology of different risk categorizations (Mallet et al. 2019). To give trust to a risk assessment, and to ensure its credibility, it is therefore important that stakeholders (also from outside, such as authorities) have trust that the risk assessment is well implemented for a specific criterion, region, or feedstock. To ensure its credibility, a risk assessment process must therefore be consistent and transparent (Mallet et al. 2019) and meet certain good practices:

Transparency: It is common practice that there is a public summary of the risk assessment, which includes for example the description of the methodology and the rationale, and the evidence gathered. Tools such as remote sensing can be used (also by stakeholders) to cross-check the audit results (discussed during the second project workshop 2022).

Consistency: **Clear description of credible risk assessment procedures and methodology:** The better a scheme describes its risk management procedures and methodology used, the more transparent it is for third parties as they gain insight in how the risk management works. Also, for auditors, it is important that the scheme clearly lays down the procedures, what risk management level they apply and for which criteria. Once schemes are vague, it is up to the auditor to make the interpretation in defining risk; leading to a risk in different interpretations which must be avoided. The scheme must be very clear how risk is defined, and where the risk assessment is used for. (Discussed during our second project workshop 2022)

Good practices in relation to credible risk identification and assessments are defined in a way, that the risk assessment considers all relevant issues and potential risks related to the commodity/ies, location(s), and supplier(s) being assessed according to (AFI 2019a; Proforest 2017; Mallet et al. 2019; PbN 2016). When risk indicators are aggregated to produce one overall risk score, there may be a risk that individual risk factors level each other out. It is therefore recommended to capture thresholds for individual risk areas in the overall indicator. Risk assessments should evaluate risk objectively based on clearly defined metrics and units. Also, risk should be characterised relative to comparable units of analysis; for instance, risk at a site level should not be compared to risk at country level, nor vice versa. Next to that, risk assessments should be developed on a region-by-region basis; the risk profile for an issue in one landscape may look very different in another. Risk assessments and profiles should also be updated periodically to ensure that risk characteristics are kept up to date and to reflect changing conditions.

Risk assessment methods must be credible, transparent and provide the necessary environmental and social data for characterising risk. It is considered good practice that a scheme provides a format and a guidance for the risk assessment, so to be able to decide what is low and high risk. The risk assessment must be implementable for the auditor in the field. The qualification of auditors is a key element for a robust the risk assessment as they should be conducted by individuals or organisations who have expertise in the topics and

contexts that are the focus of the assessment and have experience in conducting risk assessment on these topics. In addition, a credible risk assessment should also include an independent review, conducted by technical experts that have no affiliation with the company and no other conflicts of interest. Finally, risk identification processes should be iterative; meaning that, when a certain risk is observed and it is decided that it is not a negligible risk, further action and more analysis is required.

Stakeholder consultations: It is considered good practice for risk assessments that interested stakeholders have opportunities to contribute to and reflect upon the risk assessment (Mallet et al. 2019). Multi-stakeholder consultations are often effective tools for identifying risks as stakeholders have in most cases a very thorough knowledge of a certain area and can put together a more nuanced picture of the risks that are associated within an area than general indices can do (Proforest 2017). At the same time, it should be clear and transparent who influences the process (and that there is no uneven power division) and the rigour of the process towards a risk assessment. On higher level, risk also very relates to the question of what is considered sustainable and what are issues of concerns by a society. These issues can differ from country to country and are influenced by cultural and societal values. This can result in unalignment between countries on how risk is perceived because different groups of people may have been involved.

6.2 CLEAR DECISIONS ON COMPLIANCE AND NON-COMPLIANCE

A credible verification process should also include a clear methodology for making decisions on compliance or non-compliance (AFI 2020) and be clear on which conditions economic operators can be certified (EC 2021). The EU Implementing Regulation of the EC stipulates that non-conformities identified during an audit shall be classified as critical, major, and minor, each having different consequences for the economic operator (EC 2021), as shown in the following table.

Table 1 Types of non-conformities and possible consequences (EC 2021)

Type of non-conformity	Example	Possible consequence
Critical	fraudulent issuance of proof of sustainability, for example, intentional duplication of proof of sustainability to seek financial benefit	not issued a certificate; immediate withdrawal
Major	systematic problems with mass balance or GHG data reported	not issued a certificate; immediate suspension of the economic operator's certificate
Minor	a limited impact, constitutes an isolated or temporary lapse	Time period for resolution, not exceeding 12 months

7 Focusing on a specific C&V aspect related to sustainability certification of woody biomass: credible data and methodologies when adapting to new environments

This section has a focus on the importance of credible data and methodologies, especially when including new criteria and adapting to new environments and (societal) challenges.

The integration of new criteria into existing standards can be necessary due to changing policy requirements or stakeholder expectations and/or concerns. However, a certain consensus and consistency across schemes is necessary regarding the implementation of these criteria and the respective methodologies, tools, and underlying data. Otherwise, there is a danger of substantial differences in the evaluation of the criteria between the schemes and a potential "cherry-picking" from market actors.

A credible verification process must therefore have rigorous methodologies including auditable metrics and collect robust data (AFI 2019b).

7.1 CHOOSING THE APPROPRIATE DATA COLLECTION AND VERIFICATION METHODS

Data collection and verification methods range from tools like satellite monitoring to more traditional data collection methods like field audits. Which type of data (collection) is most appropriate depends on the issue and the context (Mallet et al. 2019). For example, to effectively assess compliance with and progress towards human rights commitments, on-the-ground approaches (e.g., field visits, interviews with stakeholders) are generally required (AFI 2019b, 2019a). Satellite tools are, on the other hand, useful for monitoring deforestation.

7.1.1 Geospatial tools and satellite images

Geographical risk assessments can make use of various kinds of spatially available data such as remote sensing imagery or land use databases. These tools can be a powerful and effective way of identifying geographical risks and are rapidly evolving; they become more available, accurate, and precise. It can therefore be expected that these tools are going to be more widely used in the future (Proforest 2017).

The selection of methods and tools to monitor land use/land cover change should be based on the commodity, scale of production, type of production system, and the availability of monitoring products suited to the given context (AFI 2019a).

7.1.2 Using national policies & public evidence has limitations

There are examples where existing legislation is used as a proxy to proof compliance with a requirement. However, various limitations of this approach were mentioned during the interviews:

- Laws and policies can differ from region to region.
- Policies and laws – but also the definition of sustainability - change over time.
- Legislation is often considered the lowest bar of compliance. Next to that, it often lacks a certain level of detail and rarely includes for example compensation measures or requirements around planning over a whole forest rotation. Certification can go beyond national laws and regulations, focusing on specific topics or providing more specific requirements.

- In general, it is not about the existence of laws on paper but also about how well these are implemented and controlled in the country. The role and competency of the auditor is therefore important to understand the implementation of national laws as well as consistency of their interpretation.

7.1.3 Stakeholder involvement during audits

Monitoring of social issues generally involves establishing working relationships with people potentially affected by company operations, including people of different genders, ages, and ethnicities as relevant. Effective monitoring is generally participatory and involves communities and individuals in the monitoring and assessment of outcomes (AFI 2019b).

Respondents in the interviews indicate that a good stakeholder consultation process had large added value for the audit.

At the same time, some respondents also indicate that stakeholder processes must be moderated and in practice it can be challenging to set up an effective stakeholder consultation system in the field. There may be different views and potential conflicts between stakeholders. At times, and for some regions, there is also some kind of stakeholder fatigue.

7.2 CREDIBLE DATA AND METHODOLOGIES WHEN ADAPTING TO NEW ENVIRONMENTS AND CHALLENGES

New sustainability concerns related to the use of biomass for bioenergy arose in the last years. These include concerns related to the loss of carbon stocks in soils and forests due to erosion, to direct or indirect land use change, or to the loss of biodiversity as well as long carbon payback times. Policies, such as the EU RED II, act upon these concerns and try to address them with (additional) sustainability requirements, which are taken up by certification schemes.

The presence of different end-use markets in the biobased economy that are governed by both, voluntary and mandatory certification, combined with existing differences between certification schemes leads to a risk of leakage effects. These may include environmental impacts or burdens that can shift from one sector or industry to another (e.g., indirect land use change effects). To address these concerns and anticipate on changing stakeholder and/or policy requirements, schemes can develop new principles, criteria and indicators on these upcoming issues and make claims about this. Examples of such claims are that the product is “low ILUC risk” or that the company’s operations aim to “improve food security”.

7.2.1 Limitations and possibilities to include new criteria and societal concerns

For some (upcoming) stakeholder concerns, there may be limitations in how far certification schemes can anticipate on them by adding new requirements. As certification is often limited to the geographical boundaries of the certified site and its value chain, mitigating global effects (e.g., fluctuating price levels, indirect land use change) is not possible on certification level. The certification scheme can, however, develop criteria to mitigate these effects on-site and in the value chain (e.g., by certifying for low risk of iLUC). By doing so, certification schemes can thus support policy regulators (e.g., EC, CORSIA) to mitigate these global effects.

7.2.2 Need for a scientific basis and consensus

There is a risk of greenwashing for criteria related to aspects for which there is still no widely respected evaluation method, but schemes still try to make claims about. Examples of this are iLUC and carbon accounting at forest level.

There are at this moment very complex discussions on for example carbon fluxes/stock changes in the forest, soil organic carbon, discussions on permanence, double counting with the national reporting mechanisms (NDCs), etc. (discussed during the second project workshop 2022).

These upcoming new concerns are complex issues. To reach robust certification claims on these complex issues, above all a foundation of scientific evidence is required. This includes reaching scientific consensus on methodologies for e.g., measuring carbon.

In practice, schemes may not necessarily have the appropriate structures as well as competencies to organize this and reach consensus. Next to that, stakeholder consultations may lack the required knowledge and insight of science. Collaboration with science is therefore important; also, for reaching scientific consensus on methodologies for e.g., measuring carbon.

At the end, also societal consensus ("social license to operate") is needed.

7.2.3 Need for harmonization

It is important to harmonize methodologies and approaches for (newly) established criteria and indicators to increase transparency as well as comparability across schemes (e.g., on how to model soil organic carbon).

Although harmonization is considered important, schemes may show differences in priorities, objectives, and thresholds in requirements because of different regional contexts and concerns, e.g., fire resilience is an issue in the South US and less in Canada.

Although certification schemes can show differences in their objectives, they can still harmonize their approaches and methodologies so data can be compared. A global benchmark standard, such as PEFC, can facilitate harmonization of global principles and approaches, while taking geographical contexts and regional stakeholder considerations into account.

7.2.4 Finding a balance: adapting to new requirements while providing stability and time for certificate holders to adapt

When new criteria/ indicators are integrated in the standard of a scheme, implementation starts. This also implies that auditors need training to build new competencies and adapt for new procedures.

Also, companies need to adjust their procedures to be able to comply with the new requirements. This takes time, especially when major revisions in the standard may require a significant change in practice – and additional costs - for the certificate holder. A transition time may be needed for companies to adapt, especially when there are large revisions in a standard. During this transition time, it can be challenging to explain what companies can realistically deliver and what product claim is related to this.

This also stresses the importance to reach a stakeholder consensus on new criteria during the stakeholder revision and to reach acceptance amongst the certificate holders to adapt for

these new changes. Otherwise, you may lose these stakeholders – and they may possibly move to another (lower) standard (discussed during the second project workshop 2022).

There may be a risk when schemes are pushed to improve and change all the time, and companies and auditors start to lose track. There needs to be a balance in the need to respond to upcoming stakeholder concerns and the time required for auditors and companies to accept and adjust to these new requirements.

8 Focusing on a specific C&V aspect related to sustainability certification of woody biomass: transparency and traceability in the CoC

Both the organization of data transfer, as well as the traceability of data within the structure of a certification scheme, influences the potential for verification, especially the detection of errors or fraud in the chain of custody (CoC). This issue becomes increasingly important because of increased - but often unharmonized - demand of data and claims at the end of the supply chain, e.g., about the GHG calculations and specific data needs about the type and sustainability of the feedstock (discussed during the second project workshop 2022).

In this section, we therefore focus on the importance of transparency, data transfer and traceability in the CoC. Challenges exist around traceability in the supply chain, and understanding the claim, because of:

- a combination of fundamental differences between different chain of custody models,
- mutual recognition of certification schemes, e.g., under the EU Regulatory context, and
- schemes develop tailor made modules or sub-schemes for specific (niche) markets or policy contexts.

Next to that, transparency of the data collection and transfer of data are needed to understand the robustness of processes and of a scheme, and to understand if data are correct and complete. This implies that (eligible) third parties have access and insight to these data to get oversight and to check validity. One of the conclusions from (PbN 2021) is that transparency about audit findings is important and a notable differentiator between certification schemes.

8.1 TRACEABILITY AND DATA TRANSFER USING DIFFERENT CHAIN OF CUSTODY MODELS

Traceability delivers the ability to follow the movement of a product and its components through specified stages of production, processing, and distribution (PbN 2021). Traceability can be conducted to different extents and levels of granularity. For instance, products may be traced back to a given direct or indirect supplier (e.g., a refiner, trader, farmer group, or individual farm) or to an area, e.g., a country, province, or municipality (AFI 2019b).

Traceability and chain of custody (CoC) are not the same. A CoC system includes measures that define the responsibility for the custody of materials and products when these are transferred from one organisation to another within the relevant supply chain. Its purpose is to ensure that specified characteristics (e.g., that the product is certified) are indeed the ones that are delivered in the output (Preferred by Nature 2021).

There are different CoC models. t. Examples of CoC models are segregation, mass balance or the controlled blending model (PbN 2021), see also the highlight box below. The different CoC models differ in their objective and in their level of assurance. The identity preserved model has for example a higher ability to preserve the original physical presence of the certified material than the mass balance model, while the book and claim model decouples the physical presence of the material from the administrative record flow of the material.

Policy frameworks, such as the EU RED II, include requirements on which CoC Chain of Custody model is allowed. The EU RED II requires for example that the mass balance CoC model is used as minimum for the Chain of Custody.

The following Chain of Custody models can be distinguished (PbN 2021):

- The identity preserved model is a CoC model, in which the inputs originate from a single source. In this model, the material or product is kept physically separated throughout the supply chain and the certification status is maintained throughout the supply chain. Materials or products are clearly identifiable throughout the supply chain as originating from the single source (PbN 2021).
- In the segregated or transfer model, the specified characteristics of a product are maintained, throughout the supply chain. Inputs from different sources that are all certified by the same scheme may be mixed (PbN 2021).
- The controlled blending model is a chain of custody model in which certified materials or products are mixed with non-certified materials or product, but often with a set of criteria such as Controlled Sources. This results in a known proportion of the certified material in all parts of the final output. That means that the end user will know the percentage of certified material in each product with that specific certification claim. This model applies a percentage-based calculation (PbN 2021).
- In the mass balance model certified materials or products are mixed with non-certified materials or products, resulting in a claim on a part of the output that must be proportional to the amount of certified input. The calculation of volumes may be percentage based or managed in a credit system. In this model the end- user may buy a product with no certified material (PbN 2021).
- The 'book and claim' model (B&C) is an alternative CoC model in which the administrative record flow is not connected to the physical flow of materials or products throughout the supply chain. After production of certified material, the information on specified characteristics within the supply chain is decoupled from the actual material. Credits are issued when materials or products enter the market. The credits can then be traded and sold independently of the physical delivery of certified materials (PbN 2021).

8.2 CHALLENGES AROUND UNDERSTANDING THE MEANING OF DIFFERENT CLAIMS AND WHAT THEY REPRESENT

Companies along the supply chain that take ownership of certified products and wish to make a claim[6] about their products or want to label their products with the logo of the certification scheme, must be Chain of Custody (CoC) certified.

The extent to which it is necessary to trace a product back to its origin is linked to what claims are made: claiming that a product (ingredient) derives from a specific responsible sourcing region requires that the product is traceable at least to that region or landscape. Where a sourcing company wants to make a product claim about the performance of its specific enterprise, it is necessary to trace that product back to the enterprise level (Mallet et al. 2019).

A certification scheme often has different CoC models, which are linked to different claims. It is important to understand the meaning of the different claims that are possible within a scheme, as each may hold a different weight and have different levels of meaning. Examples given by (PbN 2021) of different types of claims that are commonly used by forest certification schemes are (see also Figure 3):

- 100% from certified forest
- A mixed claim; covers material from a mix of both certified forest and originating from non-certified sources (e.g., PEFC Controlled Sources)
- A recycled or reclaimed claim, which covers material that originates from material that has been reclaimed either from pre- or post-consumer use.

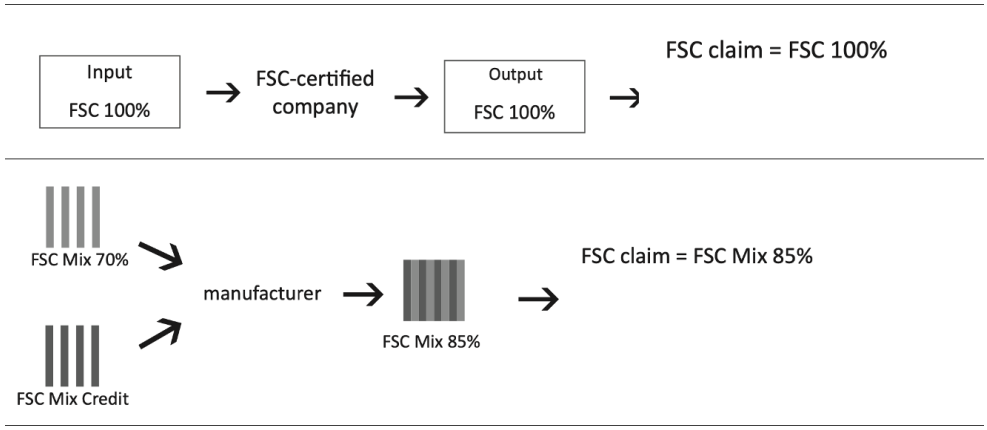

Figure 3 Example from FSC certification, and different claims resulting from different inputs and outputs of products in the CoC (FSC 2022).

[6] A certification claim refers to the language that a certification scheme allows certified organizations to make about the product they are producing or selling. This claim usually refers to the product's certified statues, such as "this product originates from sustainably managed forests". The claim is, therefore, a short description of the certification status of the product (Preferred by Nature 2021).

Transparency is thus important to understand if the claim is correct, and what it represents. One of the ISEAL Credibility principles is therefore that claims, made by an organisation, should be clear and truthful (ISEAL 2020).

8.2.1 Increased complexity due to mutual recognition of certification schemes

Cross recognition is an important topic and schemes are handling this very differently. SBP for example recognizes several other schemes; FSC recognizes none and PEFC and FSC are not accepting each other's scheme. The EU RED II requires that recognized certification schemes accept each other's evidence, to the extent of the scope of their recognition[7]. Also, certification schemes shall not refuse recognition of recognised national schemes[8] (EC 2021). Cross-recognition means in practice that multiple certification schemes can be used through the supply chain to proof compliance with certain requirements.

This is no constraint for the robustness of a scheme if the schemes are comparable in their requirements and assurance of them. This may, however, become a risk when there are differences between the schemes, and there is no insight in which scheme was used in the beginning of the supply chain, see for example the theoretical example in Figure 4.

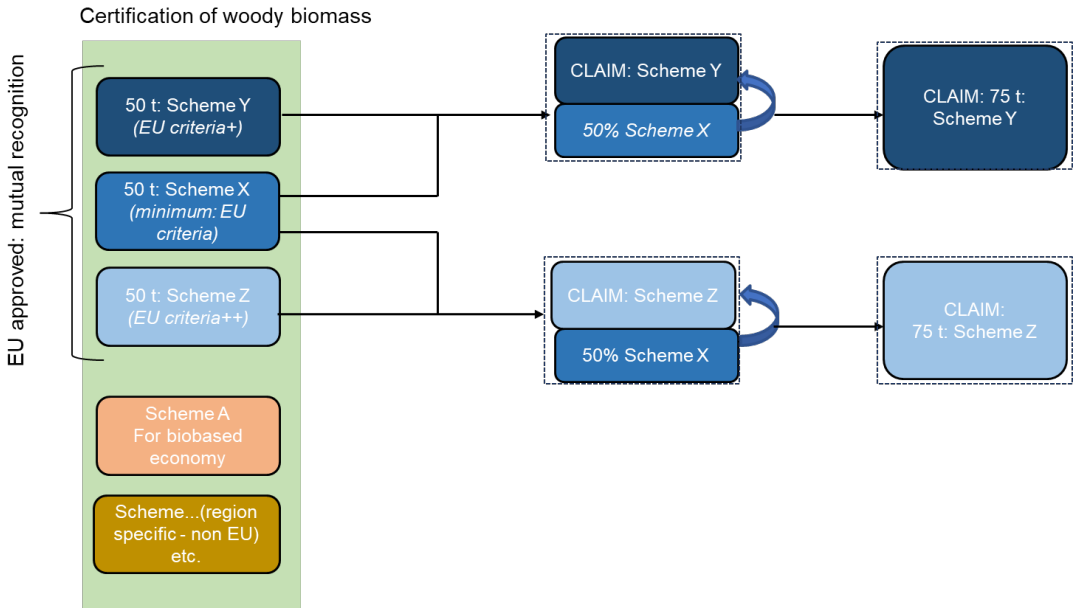

Figure 4 Theoretical example of cross-recognition of schemes. In both supply chains, the 'lower" scheme disappears. Insight in which scheme is used in the beginning of the supply chain is important.

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7 See Implementing Regulation, article 8: "Where part of the supply chain relies on other voluntary schemes, they shall accept evidence of voluntary schemes recognized in accordance with Article 30(4) of Directive (EU) 2018/2001, only to the extent of the scope of their recognition"

8 Article 9: certification schemes shall not refuse recognition of recognised national schemes as regards the verification of compliance with the sustainability and GHG emissions saving criteria set out in Article 29(2) to (7) and (10) of Directive (EU) 2018/2001, with the GHG savings thresholds set out in Article 25(2) of that Directive and with the criteria for certification of low ILUC-risk biofuels, bioliquids and biomass fuels set out in Delegated Regulation (EU) 2019/807.

8.2.2 Increased complexity due to tailor-made modules or sub-schemes

Differences in the regulatory framework results in substantial differences between the principles, criteria and indicators set in certification frameworks between various sectors of the biobased economy (Majer et al. 2018).Currently, several schemes develop different claims and modules to adapt to the (un-harmonized) sustainability criteria and demands that are laid down in different policy frameworks. It becomes increasingly important to understand what these different claims of the schemes, and their modules, represent as each may hold a different weight and meaning. The transparency of a claim and what it represents is therefore very important to understand the robustness of a scheme.

8.3 THE NEED FOR INNOVATIVE AND MORE ROBUST C&V PROCEDURES FOR THE COC

Robustness of the organisation of data transfer and traceability within the CoC influences the potential for certification fraud. This becomes increasingly important because of increased - but an often-non-harmonized demand of data and claims at the end of the supply chain; for example, about GHG calculation and specific data about the type and sustainability of the feedstock.

Regarding the data transfer through the supply chain, it is important to differentiate between:

i) quantitative information - which should ideally be gathered through widely recognized methods (such as GHG information) and transmitted through strong, fraud proof systems (such as the SBP Data Transfer System) and

ii) ii) qualitative information – which does not lend itself to the approach above (such as the strength of forest managers' compliance with OH&S requirements, or its protection of specific conservation values). Qualitative information is often more difficult to gather and process in a robust, representative way, and should not be mixed up with quantitative information.

CoC auditing in timber supply chains is currently mostly done through annual audits that normally include on-site inspection, sample control of documents and staff interviews. While this type of system is designed to verify compliance with scheme requirements, as well as to audit the volume data and conversion factors provided by the certified entities, it is not considered to be well adapted for detecting fraud in exchange of materials within and between supply chains and the volumes that are sold as certified (PbN 2021).

Important elements to increase the robustness of data transfer and traceability within the CoC are:

- The standard governance itself, which shall ensure achieving a consistent, reliable, and trustworthy traceability throughout the entire value chain is according to (Majer et al. 2018) an important step to reduce the potential for misuse of certificates, incorrect claims and to increase the overall integrity of sustainability certification. IT tools such as database solutions can also help to better understand risks while at the same time, they reduce the efforts in audits and make certification cheaper.
- Auditor competencies, which are a key element throughout the verification processes in the supply chain have to be strengthened by developing respective capacities and knowledge.

8.4 THE NEED FOR INCREASED TRANSPARENCY

A credible verification process must be transparent to help foster external review, and its scrutiny. This includes the retention and documentation of evidence, in a way that makes this information available in case it needs to be accessed (in the future). At the same time, it is also important to address confidentiality and privacy needs as well as legal requirements (AFI 2019a, 2019b).

Transparency of the data collection and the transfer of data (to the end-user) are therefore needed to understand the robustness of processes and of a scheme, and to understand if data are correct and complete. This implies that (eligible) third parties have access and insight to these data to get oversight and to check validity. Transparency about audit findings is also important and a notable differentiator between certification schemes (PbN 2021).

There are different types and levels of information sharing to get insight from data (transfers) in the supply chain, and with whom this information is shared, for example:

- First, there is information from the supply chain that is shared with auditors and contains often confidential information. Most forest certification schemes require the complete audit findings to be documented as a confidential audit report.
- A scheme may also require that part of the audit report, typically a summary of findings, is made publicly available to ensure transparency regarding the performance of certificate holders and their certification decisions.
- There are also digital databases that gather specific and detailed information from all certified companies. For these databases, you often need access rights as there are data protection issues that need to be taken care off. One example is the DTS from SBP; this information is only accessible by the scheme. Auditors can cross-check data transfers one step down and further in the supply chain (as discussed during the second project workshop 2022).
- Next to that, certification schemes can publish aggregated data, for example on certified volumes or countries of origin, and share this information for whom this is of interest. This increases the credibility of a scheme. There is room to share this type of information more broadly with stakeholders.
- Finally, schemes can be transparent about the (underlying) procedures and processes to come to certain decisions – even when certain types of data cannot be disclosed.

A right balance is needed between disclosing information on one hand, also in the interest of (outside) stakeholders and their concerns, while safeguarding the trust from companies to keep confidential information disclosed on the other hand, although they still may be shared with auditors.

To disclose information, agreement is needed from all stakeholders (voluntary) participating in the scheme. At the same time, it is mentioned that a higher level in transparency may be required when certification is required through a regulatory context.

9 Focusing on specific C&V aspects related to sustainability certification of woody biomass: competency and impartiality of auditors

In this section, we focus on the importance of competence and impartiality of auditors – as identified as a key C&V element during the interviews. The auditor competence and possible bias in experiences, skills and knowledge influence the verification process. This includes the risk assessment, such as the possibility to identify potential risks and how to address these risks in the verification procedures, e.g., by increasing the sampling size and auditing intensity, or not.

Schemes usually include requirements to ensure that certification bodies, auditors, and other personnel relevant to the compliance and verification assessment of a company are competent and impartial in their decision making (PbN 2021).

9.1 IMPARTIALITY

An independent assessment is a key component of schemes that allow public claims of compliance. Third party, independent, accredited certification is the most credible form of assessment (ISEAL 2018). Auditors must therefore be independent and free from conflict of interest (EC 2021).

9.2 REQUIREMENT FOR ACCREDITATION

Accreditation is described by (PbN 2021) as the process of evaluating and approving certification bodies to function under certain scheme rules. The goals of providing robust and objective compliance and verification assessments imply that there is consistency in the assessment and audit conclusions reached, independently of the time, location, auditor, or certification body in question.

Many third-party certification schemes include a process for accreditation and oversight of certification bodies to ensure their consistent and competent performance (AFI 2019b). This includes alignment with ISO standards or other global standards to ensure that auditors are competent and impartial. There is a difference between standards in the accreditation requirements they are asking to their certification bodies (as mentioned during the second project workshop 2022).

The EC Implementing Regulation *on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria* (EC 2021) requires that a certification body performing audits on behalf of a voluntary scheme is accredited to ISO 17065 or equivalent and to ISO 14065 or equivalent where it performs audits on actual GHG values. Also, the certification must appoint the audit team in accordance with ISO 19011 or equivalent.

9.3 COMPETENCY AND SPECIFIC SKILLS

A credible verification process includes competent auditors, with appropriate skills, knowledge and experience being verified. It is also important that auditors have a good understanding of the local context; an auditor can be good in one ecosystem (e.g., boreal forests) but not in another. Audit teams must also have the experience and generic skills necessary for conducting an audit (EC 2021). Knowledge and expertise may also be required for specific issues being verified (Accountability Framework Initiative 2019), such as for example:

- Specific technical skills needed to verify compliance with highly biodiverse grasslands and highly biodiverse forest criteria (EC 2021)
- Specific experience in auditing GHG emission calculations (EC 2021)
- For CoC criteria: experience in mass balance systems, supply chain logistics, bookkeeping, traceability, and data handling or a related field
- Technical proficiency, for example having an industrial background.

Having industrial expertise and an engineering background is important for auditors to be capable of assessing the CoC, to interpret the data and to detect potential fraud. Although, the focus often lies more on expertise related to forest management, RSB is one scheme that requires from auditors to have a background in industry, but this is not common practice for all schemes; the focus often lies more on requiring (only) expertise related to forest management (mentioned during the second project workshop 2022).

9.3.1 Challenge to keep up with increasing requirements

There can also be a difference in the environmental and social requirements of the scheme and the required competencies for the auditor. Auditors can be challenged in the social aspects and requirements of a scheme, and they are considered more complicated to assess. Next to that, it requires cultural knowledge, language skills and an understanding of the regional context. Also, some schemes become increasingly complex in their requirements and scope. When expectations are becoming increasingly complex from evolving standards, it is highly challenging for auditor (teams) to keep up with the required skills and expertise.

9.4 TRAINING, EXAMS, EXCHANGE AND GUIDANCE FOR AUDITORS

The activities of a certification scheme to support auditors, especially regarding the interpretation of criteria and indicators “on field” (e.g., auditor checklists, handbooks, etc.), can be a useful indicator for the quality of a scheme.

The EC implementing regulation requires that certification schemes set up training courses for auditors, covering all aspects relevant to the scope of the scheme. The courses must include an examination to demonstrate the participants’ compliance with the training requirements in the technical area or areas in which they are active. Auditors must participate in the training courses, before performing audits on behalf of the certification scheme. Also, auditors must undertake refresher training courses on a regular basis; and certification schemes shall implement a system to monitor the training status of active scheme auditors (EC 2021).Centralised training and exams provided by a scheme are considered useful. There are, however, different ways to provide a training and an exam; It is important that the exam is not an easy “tick the box” to ensure that everyone passes, but that the exam instead really tests the auditor in its competencies.

Next to that, it is important that schemes provide guidance to certification bodies on aspects

that are relevant for the certification process. That guidance may include updates to the regulatory framework or relevant findings from the certification scheme's internal monitoring process (EC 2021).

Country or regional exchanges between auditors can also be a good tool to create a space where auditors can share information on their experiences, and to get agreement on the interpretation. When issues are not clear, auditors can request further interpretation from the certification scheme.

9.5 LIMITATIONS OF COMPETENCIES WHEN CIRCUMSTANCES (MARKET PRESSURE) FAIL - CLEAR REQUIREMENTS ARE ESSENTIAL

The auditor competency is important but even very skilled auditors have their limitations when they are working under challenging circumstances. This is for example the case when the sampling or scope are not defined properly, or when auditors have not enough time.

The audit duration is often not defined by a scheme but left to the certification body or auditor. This means that, when additional expertise is required, it is often up to the CB to include an additional expert or not. When a scheme only develops guidance, and has no requirements, the market will determine the duration. In this case, there is a risk for a race to the bottom as the market competition is strong and tends to drive prices (and time spent in the field) down. From the point of accreditation this is all fully correct, as accreditation does not look at guidance but checks the certification body in fulfilling the requirements of a scheme.

Thus, making requirements mandatory (and not guiding) is important if it is a key topic. At the same time, schemes and other relevant stakeholders should be aware that additional auditing requirements have economic and financial consequences for the audit (e.g., duration, costs), and thus for companies as well.

10 Trends, perspectives, and improvements for the future

This section focuses on trends, perspectives, and potential improvements for the future, that came up during the analysis of literature, the expert interviews, and workshops.

One of the key findings from the analysis is that policy trends, markets and certification schemes are dynamic and change over time. Due to their standard revision cycles, certification schemes are usually organised in a way which allows them to regularly adapt to trends and new developments. One of ISEAL's Credibility principles is referring to continuous improvement, meaning that certification schemes should regularly review the performance of their schemes and evaluate the impacts of tools, while integrating new innovations. (ISEAL 2020). The ISEAL Innovation fund – as part of ISEALs innovation program - supports innovations that help sustainability certification schemes deliver more value to their stakeholders and effectively drive improvement over time, and at scale, recognizing that the sustainability landscape is continuously changing (ISEAL).

In the following sections, we summarise some of the main trends and perspectives identified.

10.1 TECHNICAL INNOVATIONS

A major trend in certification is the digitalization of elements such as data transfer systems, auditor information (e.g., checklists), digitalization of audit reports, auditing tools (e.g. remote sensing instruments, etc.). Also, The European EU Commission recognises the importance of the registries and databases as tools to trace sustainability characteristics in a trustworthy manner (Majer et al. 2018).

A key reason to integrate technical innovations in certification schemes is to improve robust data collection and verification processes for specific parts of the certification procedure. The main innovations identified, which could contribute to robust data collection and verification are around data collection, processing, and data analytics. More specifically:

- Digitalization of the general data transfer system, including elements as audit information, digital audit reports, digital claims, harmonised digital audit reporting templates.
- Availability and accessibility of claim and certificate information (e.g., ISCC certificate database).
- Digital tools to support auditors (e.g., GRAS Tool for remote sensing information, GHG calculator, etc.)
- Online inventories of system/standard documents.
- Block chain as a tool for the general traceability of sustainability information.

Increased digitization of audits, interfaces and auditing tools can also help to improve efficiencies and integrity. There are, however, also limitations regarding the applicability of these innovations. For example, remote sensing can be a meaningful tool to support the assessment of some environmental indicators (e.g., for land use change and carbon stock developments), but for other indicators it will not work, e.g., social aspects or monitoring human rights, for which often country-level indices are being used.

Digital, and maybe even centralised databases can help to improve the data transfer and traceability of information across a chain of custody and the associated stakeholders and market actors.

Block chain technology, potentially also combined with species testing, is one of the optional tools (more solutions exist) to improve the control of volume data and basic information on species and origin in future CoC systems. Various organisations and certification schemes, such as RSB, explore the option to use this technology in supply chains and for transaction verification (Walker 2021; PbN 2021). Although blockchain is a promising technology for certification schemes, there may also be potential limitations in its use (discussed during the second project workshop 2022):

- Once data is included in the blockchain, it cannot be removed. It is therefore difficult to solve errors once put in the database, although automated procedures might solve this partly.
- Likely, not all actors will join the same digital blockchain platform and there is no exchange between platforms. This can potentially hinder efforts and initiatives for harmonisation across schemes and industry sectors.
- The application of blockchain technologies can be very energy intense.

Collecting the complete and correct data as input for the database remains the crucial step, which cannot be solved entirely by an application of the blockchain technology alone.

10.2 POLICY TRENDS LINKED TO C&V OF CERTIFICATION SCHEMES

Despite their general ability to develop and adapt to new trends and requirements, changes in the scheme documents of certification are also time and resource intense processes. Thus, a certain stability in the general (policy) frame conditions and requirements under which schemes operates is important. There is the plea for harmonization in policy requirements across countries. There are currently relatively small differences in the interpretation of sustainability requirements between the policy frameworks of the Netherlands, Denmark, and the UK. For example, it is not per se possible to supply biomass to the Netherlands that is suitable for the UK, because of differences in e.g., a technical definition in wetlands. It is important to note, that these relatively small differences in definitions and implementation of general sustainability requirements create complexities and inefficiencies in the market and may at the end work counterproductive for the overall impact that one aims to achieve, i.e., to improve the overall sustainability of the forest, criteria need to be stronger and better aligned.

Next to that, it is crucial to address hot topics for which there is yet no satisfactory normative solution. Examples given are the cascading use of wood and indirect land use change or addressing and/or accounting for emissions at the stack. A first step to agree upon is whether an issue such as iLUC should be addressed by certification (alone) or whether (in addition) alternative, integrated approaches are needed which address these issues on a larger scale.

Auditor qualification and support is increasingly considered one of the main aspects to support the credibility and the robustness of certification schemes. The introduction of stringent general requirements regarding qualification of auditors on a policy framework level is considered a meaningful measure to level out some of the main differences between schemes and to harmonise auditing quality. Next to that, the need for coherence between different policy frameworks that address (partly) the sustainability governance for bioenergy is becoming of increased importance. Currently, due diligence policies are being developed and implemented on various policy levels. Some examples related to the sustainability of biomass and biomass value chains on EU level are:

The upcoming EU Regulation on halting deforestation:

- This regulation aims to set mandatory due diligence rules for operators that place specific commodities, including timber, on the EU market which are potentially associated with deforestation and forest degradation. Its purpose is to ensure that only deforestation-free and legal products (according to the laws of the country of origin) are allowed on the EU market.

The existing EU Taxonomy Regulation:

- The EU Taxonomy is a classification tool aimed at investors, companies, and financial institutions to define environmental performance of economic activities and sets requirements for those activities to be considered sustainable. Technical screening criteria are developed for economic activities, such as the forestry sector, on climate change mitigation and adaptation and includes for example “Do no significant harm” criteria on water, biodiversity, and other aspects.

The upcoming proposal for a Directive on Corporate sustainability due diligence:

- This proposal aims to foster sustainable and responsible corporate behaviour throughout global value chains. Companies will be required to identify and, where necessary, prevent, end or mitigate adverse impacts of their activities on human rights, such as child labour and exploitation of workers, and on the environment, for example pollution and biodiversity loss.
- It is very likely that these policies will exist next to policies like the Renewable Energy Directive. Consequently, companies will be required to integrate due diligence within their management, next to, as part of and/or complementing their sustainability certification.
- In general, the use of Due Diligence instruments on a company level may reduce the efforts associated with a certification process for a company. On the other hand, there are observations of developments induced by the implementation of the EU Timber Regulation (EUTR), showing that some importers of timber products into the EU have stopped valuing and appreciating certified products, although their requirements go beyond the legality requirement of the EUTR, partly because of a weakened market demand. This can lead to decreased demand for certified timber and may also lead to decrease of sustainability in certain markets. If market actors are not rewarded for their certified products, they will not pay the higher costs that are required to attain certification.

10.3 HARMONIZATION AND COLLABORATION ACROSS CERTIFICATION SCHEMES

Over the recent years, market actors and policy makers have initiated efforts to establish a continuous exchange and collaboration between certification schemes. Examples for this development are partnerships (ISEAL Tue, 2022) and multi-stakeholder platforms, which shall facilitate more information flows between and towards certification schemes. Regular meetings, exchanges on best practice of auditing etc. should be introduced. Based on learning and exchange, continuous development and improvement of (specific) elements in certification schemes should be further supported, for example on the level of quality management systems, integrity programmes, auditor qualification, etc., across all the supply chain. Ideally together (within the certification community), based on best practices.

11 Conclusions and recommendations

The section summarises the main conclusions from the analysis of elements for compliance and verification in certification schemes.

11.1 MAIN CONCLUSIONS

Sustainability certification can complement and support sustainability governance

Sustainability certification can be considered a meaningful and relevant tool to support the development of sustainable biomass production and sourcing if it. It can be considered as a tool which can support and drive processes to steer towards a higher level of sustainability or a continuous improvement of specific sustainability criteria in defined biomass supply chains.

There have been significant developments regarding the implementation of new tools (e.g., based on remote sensing technologies), criteria and indicators as well as internal governance elements in certification schemes, since the development of the first schemes for forestry biomass in the early 1990s. In most bioeconomy markets, sustainability certification is voluntary, and market driven. The implementation of a sustainability certification can, however, not guarantee sustainable biomass on its own. As one of the elements, it should be used and integrated in a coherent and functional overall governance sustainability framework, complemented by other elements (such as national policies, laws) to assure compliance with legislation, state authorities, international agreements, and certification requirements.

Certification schemes are operating in dynamic environments with various trade-offs

Most existing sustainability certification schemes aim to identify, address, and reduce potential sustainability risks associated with the production, trade, and utilisation of biomass resources. The general set-up of the schemes as well as their operation is influenced and driven by a wide range of factors such as stakeholder expectations, market demand, the development of potential competitors, policy requirements, the dynamics of their internal processes, etc. Within these dynamics, there are a number of potential trade-offs to be considered, for example in relation to expected sustainability impact, level of efficiency and applicability of a scheme and its principles, as well aspects such as costs, uptake and the complexity of the certification.

In that sense, depending on the overall market and policy framework, there can be a risk for a ‘race to the bottom’ since the more complex and ambitious schemes, with a higher level of assurance, risk to lose market shares to less ambitious schemes with lower levels of assurance. There lies a responsibility at policymakers and the sector itself to prevent this downward cycle, as it may create true risks for losing trust and reputation for guaranteeing the sustainability of a sector.

A broad multi-stakeholder representation is a key to drive a continuous improvement of standards

Several sustainability certification schemes are based and driven by continuous stakeholder involvement. Broad multi-stakeholder representation can provide room for a dialogue and discussion to better understand concerns, and how sustainability risks may change over time – which can be used for revising and further improving the standard s. In several cases, the standards of certification schemes strongly reflect the values and interests of the involved stakeholder groups.

This same multi-stakeholder representation may also provide a platform for discussing broader societal concerns. Examples are discussions around an appropriate geographic scale for evaluating maintenance of forest carbon.

However, there are also very clear limitations in the role that certification schemes can play to reach societal consensus on sensitive issues. Some issues go beyond the scope of certification, or touch upon issues which cannot be solved by certification (alone). In all cases, it is very important to recognise that also several stakeholder groups outside the certification community (e.g., scientists, governments) have an important role to play.

Regular standard revision processes allow to integrate new developments

Schemes are in a good position to include the latest science, stakeholder concerns and policy trends. At the same time, there may be a tension in how fast certification schemes can integrate new criteria in their standard, and the time that is realistically needed to allow for a robust standard revision cycle with strong stakeholder involvement.

There is a risk when schemes are pushed too hard to improve and change all the time, companies and auditors start to lose track. There needs to be a balance in the need to respond to upcoming stakeholder concerns and the time required for auditors and companies to accept and adjust to the new requirements.

A transition time may be needed for companies to adapt, especially when there are large revisions in a standard. Auditors may also need new competences and training to adapt for the new requirements (discussed during the second project workshop 2022).

It is important to balance the need for clear procedures with auditor competencies and flexibility

Clarity and specificity of the certification scheme and audit scope can lead to better consistency in the auditing and risk assessment procedures, and greatly impact the functioning of auditors. This is relevant, whenever the procedures of the certification scheme allow for different interpretations, for example during the assessment of a specific indicator.

Certification schemes have to find a balance in creating a standard which in general allows an application to a wide range of processes and products on one hand and a precise guidance, which ideally does not allow for too much interpretation on the other hand. While a more flexible and generic standard, which is applicable to a wider range of supply chains, seems to be meaningful, it also increases the challenges for auditors, who will interpret the respective procedures during audits in the field. In the specific example of the RED II framework, this potential issue originates partly from imprecise and unclear policy requirements (e.g., related to the GHG mitigation requirements in the RED II) which have to be translated and

implemented into the standard documents and audit procedures of the different certification schemes.

Risk assessment processes are a key element at all levels of the certification scheme development and application

In general, a risk assessment relates to the question of what is considered sustainable, and consequently, which risks do potentially exist for a feedstock or supply chain in a certain environment. The interpretation of the risks and the outcome of the risk assessment is subject to a number of parameters, amongst others, stakeholder values, which might also change over time. Risk assessments and analysis are key elements in several stages of standard development and continuous improvement as well as a part of the early stages in the verification processes. A key question for policy makers and regulators is, if it is possible to objectively evaluate and measure the risk of relevant sustainability topics, which are translated into respective criteria and metrices of certification schemes.

A second important aspect related to the risk assessment is on what geographic level sustainability is measured. Some criteria, such as carbon fluxes and water, can probably be evaluated on a larger scale, and some on the forest level.

It is considered meaningful to differentiate the discussion of risks according to the specific indicator as well as to the region in which the audit takes place. Factors that influence the choice of a (risk) monitoring approach are: i) the type of issue; (ii) the available assessment methodologies or monitoring tools available for this issue; (iii) feasibility: At what scale does it make sense to measure the issue?

Risk identification and assessments have a certain level of s*ubjectivity*. To ensure its credibility, a risk assessment process must therefore be consistent and transparent and meet certain good practices. For example: the better a scheme describes its risk management procedures, the more transparent it is for third parties (Workshop, 2022).

Harmonization of methodologies for criteria evaluation can help to increase comparability across schemes

Although certification schemes can show general differences, it is important to harmonize methodologies and approaches for (newly) established criteria and indicators to increase transparency as well as comparability across schemes. This can help to increase the transparency across schemes and to prevent a potential race to the bottom regarding the quality in the implementation of specific requirements in certification procedures.

Transparency of a scheme is a key element to understand its robustness

Transparency of the data collection and transfer of data are needed to understand the robustness of processes and of a scheme, and to understand if data are correct and complete. This implies that (eligible) third parties have access and insight to these data to get oversight and to check validity. A right balance is needed between disclosing information on one hand, also in the interest of (outside) stakeholders and their concerns, while safeguarding the trust from companies to keep confidential information– which may be shared with auditors – undisclosed on the other hand.

Also, some schemes become increasingly complex in their requirements and scope. When expectations are becoming more complex from evolving standards, it is highly challenging for

auditor (teams) to keep up.

Developing auditor competencies is important

Auditor competencies are considered as one of the most important elements for the robustness of the compliance and verification procedures in certification schemes. Centralised training and exams provided by the scheme are considered very useful. It is important that the exam is not an easy “tick the box” to be sure that everyone passes, but that the exam really tests the auditor in its competencies (Workshop, 2022).

The auditor competency is important but even very skilled auditors have their limitations when the circumstances they are operating in are unfavourable. This is for example the case when the sampling or scope are not defined properly, or auditors have not enough time. In this case, strong market competition between certification schemes may be leading, also stimulating a race to the bottom effect as auditing teams may be formed based on cost-efficiency and not necessarily based on required time and competencies. Schemes can support auditors by providing consistent and clear auditing procedures. However, schemes and other relevant stakeholders should also be aware that comprehensive auditing requirements have economic and financial consequences for the audit (e.g., duration, costs), and thus for companies as well.

11.2 RECOMMENDATIONS

Based on the analysis of certification schemes and the two expert workshops conducted during the project, this section includes five main recommendations to strengthen compliance and verification for the sustainability certification of woody biomass.

The recommendations are briefly described, followed by a summarising table with recommendations for the involvement of different stakeholder groups.

1. **Develop complementarity of governance tools to strengthen the robustness of sustainability**

The broader discussion about experiences made with the certification of forest biomass and biomass in general, has shown that sustainability certification is not a stand-alone tool to guarantee sustainability. Certification can be a powerful instrument to support and motivate the development of market actors towards more sustainably and to verify compliance with requirements from market actors or policy instruments – especially when a certain scale is reached. However, to reach further scale and to address structural issues that go beyond the company level and take place in the landscape, it is important that certification is integrated with alternative approaches, such as governance frameworks (e.g., policies) to assure compliance with legislation or international agreements, and certification requirements. For this purpose, it seems relevant to explore how certification can be further integrated in landscape, jurisdictional and other regional and national governance approaches and how certification can strengthen due diligence instruments, and vice versa. Ideally, this can help to develop complementary elements, supporting the robustness of sustainability governance.

2. **Prevent a race to the bottom. Set clear minimum requirements and support a development towards more sustainability**

In most biomass markets, sustainability certification schemes compete for market relevance. Since there is not necessarily a clear benefit for market actors when working with more advanced or ambitious schemes - especially when policies have lower sustainability requirements and there is no push from the market - complex or ambitious schemes do often have a lower market relevance. This can result in a race to the bottom. It is important to acknowledge that this represents a clear risk, which might compromise the reliability of the instrument of certification and the trust in the sustainability of a sector in general. Setting minimum requirements and standards for critical aspects such as on sustainability requirements, but also regarding the minimum assurance requirements regarding the practical implementation of these requirements in certification procedures, including aspects such as auditor training and support, seems to be highly important.

3. **Harmonize approaches, concept, and methodologies**

Following the previous aspect, we recommend fostering more exchange and harmonisation across certification schemes. This can help to develop a level playing field and a common basis regarding sound and robust criteria and indicators as well as implementation procedures.

Next to that, further harmonisation also increases comparability and transparency across schemes. It can also support the introduction of new developments, including aspects such as supportive tools for auditors, new risk assessment tools, etc.

Policy frameworks (e.g., on national or on EU level) that use certification as a co-regulation tool to proof compliance with sustainability requirements also have a key role to play in promoting further harmonisation across sectors and regions. This also includes further harmonising compliance and verification requirements, such as regarding the quality of auditor training.

4. **Create a foundation of scientific evidence for complex issues**

Certification schemes for forest biomass are operating in complex and dynamic systems. The relevance of sustainability risks in certification might change over time due to stakeholder perception and/or progress in scientific impact assessment approaches. Therefore, certification schemes integrate new topics into their sustainability requirements, while some recently new criteria still seem to lack societal consensus.

There are at this moment discussions on the integration of relatively new topics such as for example carbon fluxes in the forest, soil organic carbon or discussions on permanence into the standards of certification schemes. These upcoming new concerns are complex issues.

More and constant exchange with the scientific community can help to create a clear foundation of evidence regarding; i) the identification of new risks and necessary additions to the existing requirements, ii) clarifying whether or not the topic should be addressed by certification and - if yes - iii) the development of sound and robust methodologies and tools for the implementation of appropriate criteria, indicators and certification procedures which allow for an objective evaluation, risk assessment and measuring of relevant sustainability topics. Next to that, it is important that there is sufficient attention for the implementability of new criteria on the ground, looking at different regional contexts and producing groups.

In practice, schemes may not necessarily (yet) have the appropriate structures as well as competencies to organise this. A consideration of interfaces to science and society, for example through the implementation of technical working groups with external experts can help certification schemes to understand the availability and readiness of new tools and methodologies as well as effective ways for their implementation (e.g., through pilot audits, etc.).

5. **Strengthening the robustness of transparency, data transfer and traceability in the CoC**

Transparency of certification procedures and processes as well as data collection, verification and transfer of information are key elements to ensure the functionality and robustness of a certification scheme. Measures and elements which can be implemented and further improved to increase the robustness of data transfer and traceability of sustainability information within the CoC relate for example to the strength of the standard governance elements, the qualification and continuous development of auditor competencies as well as tools for digitalisation of information. The latter can include tools like robust database solutions which can also help to better understand risks, while at the same time they reduce the efforts in audits and make certification cheaper.

The above-mentioned recommendations are ideally combined to realise the most impact. A collaborative uptake is needed by a range of stakeholders, including certification schemes and certification bodies, policymakers, science, and NGOs.

Table 2 Summary of main recommendations and target groups

Recommendation	Actors involved?
1.Develop complementarity of governance tools to strengthen the robustness of sustainability	
Create more insight in the strengths and weaknesses of various governance tools so to strengthen sustainability	Scientific community in cooperation with policy makers and certification schemes
Explore how certification can play a role in due diligence and other governance tools, and vice versa	Policy makers should define the goal and scientific groups make the analyses.
Create awareness on what certification can and cannot do	Certification schemes, policy makers, NGOs, industry
2.Prevent a race to the bottom: Set clear minimum requirements	
Set a minimum bar as sector	Industry
Define clear minimum requirements (not guidance) on C&V	Certification schemes Policy makers (when certification is used as co-regulation instrument)
Develop incentives to motivate the sector for continuous improvement	Industry (buyers) Policy makers (when certification is used as co-regulation instrument)
3.Harmonize approaches, concept, and methodologies	
Harmonize methodologies and approaches for (newly) established criteria and indicators to increase transparency and comparability	Certification schemes Policy makers (when certification is used as co-regulation instrument)
Promote cooperation and exchange between certification schemes, also to exchange on new developments (tools, developments of new criteria, etc.)	Certification schemes An umbrella organization as ISEAL can take a leading role
4.Create a foundation of scientific evidence for upcoming new complex issues	
Establish and develop interfaces to science and society, for example through the implementation of technical working groups with external experts	Science in collaboration with policy makers, certification schemes, NGOs and the sector
Strengthen the scientific foundation on what is considered sustainable, also for the long-term, also for political/ policy decision-making	Scientific community in collaboration with certification schemes, policy makers and civil society
5.Strengthening the robustness of transparency, data transfer and traceability in the CoC	
Development of IT database solutions, also for complex and long supply chains	Certification schemes in collaboration with science, governments, and the sector

Enhance transparency by sharing procedures, processes to a wider group of stakeholders	Certification schemes
Provide clarity on the claim – at the end of the value chain and before	Certification schemes
Monitor impacts and share them	Certification schemes

Publication bibliography

AFI (2019a): Operational Guidance on Monitoring and Verification. Accountability Framework Initiative.

AFI (2019b): Operational Guidance on Supply Chain Management. Guidance on effective supply chain management to help ensure compliance with commitments, including through risk assessment, traceability, identification of supplier non-compliance, and implementation of plans to bring suppliers into compliance. Accountability Framework Initiative. Available online at https://accountability-framework.org/wp-content/uploads/2019/06/Operational_Guidance_Supply_Chain_Management.pdf.

AFI (2020): Operational Guidance on Monitoring and Verification. Guidance on norms and good practices for monitoring and verification related to company commitments, focusing on environmental and social outcomes associated with raw material production and primary processing. Accountability Framework Initiative. Available online at file:///C:/Users/smajer/AppData/Local/Temp/OG_Monitoring_Verification-2020-5.pdf.

AFI (2022): Home | Accountability Framework. Accountability Framework Initiative. Available online at https://accountability-framework.org/, checked on 12/11/2022.

Burkhardt D. (2020): DRAFT REPORT with recommendations to the Commission on an EU legal framework to halt and reverse EU-driven global deforestation. (2020/2006 INL), 6/15/2020. Available online at https://www.europarl.europa.eu/doceo/document/A-9-2020-0179_EN.html.

EC (2003): Interinstitutional agreement on better law-making. OJ C 321, p. 1-5. European Commission.

EC (2009): Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC. RED. European Commission. Brussels, Belgium.

EC (2018): Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 - on the promotion of the use of energy from renewable sources (recast). RED 2.

EC (2021): Commission implementing regulation (EU) on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria.

FSC (2022): FSC Chain of Custody FAQs. Edited by FSC US. Available online at https://us.fsc.org/preview.fsc-coc-faq.a-446.pdf.

ISEAL: Innovations in standards. ISEAL Alliance. Available online at https://www.isealalliance.org/innovations-standards, checked on 12/12/2022.

ISEAL (2018): Assuring Compliance with Social and Environmental Standards. ISEAL Code of Good Practice. Version 2.0. ISEAL Alliance. London. Available online at https://www.isealalliance.org/sites/default/files/resource/2018-02/ISEAL_Assurance_Code_Version_2.0.pdf.

ISEAL (2020): ISEAL Credibility Principles revision: First round consultation draft, Credibility Principles V1.1. Webinar: "The credibility of sustainability tools in a policy context: what matters and why?". ISEAL Alliance, 2020.

ISEAL (2021): ISEAL Credibility Principles. Version 2. ISEAL Alliance.

ISEAL (Tue, 2022): Governments. ISEAL Alliance. Available online at https://www.isealalliance.org/working-partnership/governments, updated on Tue, 12/6/2022, checked on 12/12/2022.

ISO (2022): ISO - International Organization for Standardization. Available online at https://www.iso.org/home.html, checked on 12/11/2022.

ITC (2020): Standards Map App. Edited by International Trade Centre. Available online at https://standardsmap.org/en/identify, checked on 12/21/2021.

IUCN (2019): Setting the biodiversity bar for palm oil certification. Edited by IUCN National Committee of The Netherlands (IUCN-2019-022, En).

Majer, Stefan; Wurster, Simone; Moosmann, David; Ladu, Luana; Sumfleth, Beike; Thrän, Daniela (2018): Gaps and Research Demand for Sustainability Certification and Standardisation in a Sustainable Bio-Based Economy in the EU. In *Sustainability* 10 (7), p. 2455. DOI: 10.3390/su10072455.

Mallet, P.; D'Hollander, D.; Oswald, K.; Fishman, A. and Gamble, L. (2019): Credible Assurance at a Landscape Scale: A discussion paper on landscape and jurisdictional assurance and claims. Discussion Paper. Edited by World Wildlife Fund. Available online at https://www.isealalliance.org/sites/default/files/resource/2019-03/Credible-Landscape-Assurance-Discussion-Paper_WWF_ISEAL_03_2019.pdf.

NL Agency (2012): Selecting a biomass certification system. A benchmark for level of assurance, costs and benefits. NL Agency.

PbN (2016): Using a risk based approach to avoid illegal timber. Preferred by Nature. Available online at https://preferredbynature.org/newsroom/using-risk-based-approach-avoid-illegal-timber, updated on 12/21/2021, checked on 12/21/2021.

PbN (2021): Report: Study on Certification and Verification Schemes in the Forest Sector and for Wood-based Products. Edited by European Commission. Preferred by Nature. Brussels. Available online at https://op.europa.eu/en/publication-detail/-/publication/afa5e0df-fb19-11eb-b520-01aa75ed71a1/language-en.

Proforest (2017): Quantifying sustainability risks among suppliers and certificate holders. Best practices and lessons learned. A study commissioned by ISEAL Alliance. ISEAL Alliance. Available online at https://www.isealalliance.org/sites/default/files/resource/2019-02/ISEAL_Proforest%20Risk%20study_report_Jan2017_Final.pdf.

Schleifer, Philip (2018): Varieties of multi-stakeholder governance. Selecting legitimation strategies in transnational sustainability politics. In *Globalizations* 16 (1), pp. 50–66. DOI: 10.1080/14747731.2018.1518863.

Stickler, C.; Duchelle, A. E.; Ardila, J. P.; Nepstad, D.; David, O.; Chan, C. et al. (2018): The State of Jurisdictional Sustainability. Synthesis for practitioners and policymakers.

Ugarte, S.; Iersel, v. S.; Voogt, M.; Fedrigo, D.; Crepy, M.; Majer, Stefan (2020): Proposal for a co-regulation framework for the use of sustainability certification schemes in the production of bio-based products. Deliverable 9.3 of the Star-ProBio project. Available online at http://www.star-probio.eu/wp-content/uploads/2017/04/D9.3_Proposal-for-a-coregulation-framework_Final.pdf.

Ugarte, S.; Swinkles, V. (2015): Policy Instruments and Co-Regulation for the Sustainability of Value Chains: ASME Press.

van Dam, J.; Ugarte, S. (2022): Improvement opportunities for low-carbon, sustainable

biofuel policies and certification schemes –. Part 1: A review of policy frameworks. Report for IEA Bioenergy Task 39. Edited by IEA Bioenergy Task 39.

Walker, Hannah (2021): Combatting Fraud with Technology. RSB & Bioledger Launch Biofuels Blockchain Case Study. In *The Roundtable on Sustainable Biomaterials (RSB)*, 2021. Available online at https://rsb.org/2021/03/12/combatting-fraud-with-technology-rsb-bioledger-launch-biofuels-blockchain-case-study/, checked on 12/12/2022.

12 Appendices

12.1.1.1 Appendix 1 – Template of interview questions

Block I General questions

1. **Can you indicate in the table below (by an "X"), for which aspects you see differences between the five mentioned certification schemes, which are relevant for certifying forest biomass?**

Amount of difference in C&V between certification schemes by FSC, PEFC[9], ISCC, RSB and SBP					
Aspects:	Almost none	Little	Medium	High	Very high
Range of sustainability criteria (e.g., water, social issues) included in the standard					
Procedures and type of indicators used to proof compliance with the criteria*					
Clarity and ease of comprehension of indicators and verification procedures					
Type of audits (field audits, desk-based) and frequency of audit					
Transparency and public availability of verification procedures and standard documents					
Sampling requirements for audits					
Auditing requirements (impartiality, qualification of auditors, experience....)					
Geographical scope of verification (forest unit, sourcing area, landscape level – or a combination of them)					
Level of stakeholder consultation (to what extent do stakeholders have an opportunity to provide input to the audit)					
Transparency of claim(s) throughout the supply chain: Allowable claims contain enough information to check their validity					

[9] Also including national recognized PEFC schemes

Robustness of information transfer** through supply chain to the end-user					
Consequences of non-compliance (when is a certificate suspended or withdrawn?)					
Appeals and complaints procedures (can operators address certain auditing decisions, if they do not agree? Are these procedures publicly available?)					
Cross-recognition of other schemes (do schemes recognize other schemes, and on which conditions?)					
Scheme governance (scheme management, standard setting, revision of standards)					
Other....					

* How measurable and robust are they? ** which information and how reliable is this information

2. **Looking at the table in Q1: please indicate, for those aspects that have a score of medium, high or very high, the extent to which these differences affect the robustness of certification schemes, and herewith the credibility of certification as co-regulation instrument?**

3. A) For certification schemes: **what are your considerations when finding an appropriate balance in the credibility of certification (through robust compliance and verification) on one hand and being efficient (e.g., by minimizing costs, low administrative burden) on the other hand?**

   B) For auditors: **What are your considerations when certification systems aim to guarantee sustainability through the development of 'new' and maybe complex criteria (e.g., ILUC, carbon) while there is, on the other hand, also a need that these criteria and indicators are implementable and auditable in the field? How can this be improved?**

Block II Questions that address specific C&V issues

Explanation for question 4: Some sustainable forest management (SFM) schemes, sometimes linked to specific claims, require that sustainability criteria are verified on forest management unit level (for some of their claims), while others verify compliance on a larger geographical area, often using a risk-based approach. The RED2 refers to a management system on 'sourcing area level' under option b from Articles 29.6 and 29.7.

4. **Concerning the geographical scope for verifying the criteria for sustainable forest management, how should this be defined, and what criteria should be determining?**

A) sub-question: **in how far can the landscape approach (where a landscape is certified that includes multiple land uses including forests) be considered an appropriate geographical scope (or not)?**

Explanation for question 5: The RED2 makes use, and relies on public evidence (laws, policies) and its enforcement and management systems in place as proxy to proof compliance with some of the sustainability criteria for forest biomass (see Article 29.6 and 29.7).

5. **Do you think that national policies and legislation could, or should be used, 'as proxy' for compliance with certain sustainability criteria - why (not), and if yes, under which conditions (can you provide an example)?**

Explanation for question 6: Tools and approaches for monitoring should be appropriate to the commodity, geography, and production context, and to the nature of the issues being assessed. Four factors that influence the choice of (risk) monitoring approach are (i) the type of issue (e.g. child labour or halting deforestation) being assessed; (ii) what assessment methodologies or monitoring tools (e.g. survey or satellite imagery) are available for this issue; (iii) at what scale does it make sense to measure the issue and (iv) what is the risk profile of that issue in that place?

6. A) For certification schemes: **(Perceived) risks change over time. Furthermore, certification schemes have also the ambition to improve sustainability over time. How do you include this 'rationale" in your work/scheme?**

B) For auditors: **When doing an audit, local contexts and (perceived) risks change over time, while there is at the same time the ambition to gradually improve the sustainability of a forest or farm. How do you try to include this 'rationale" in your auditing work?**

C) For certification schemes and auditors: **Do you think that this 'rationale' is sufficiently embedded in the RED2? And if no, how can this be improved and/or integrated in an upcoming delegated act?**

Explanation with question 7: Most sustainability criteria (biodiversity, carbon, source) are verified at the beginning of the supply chain (in the forest)- and the proof for compliance then moves further in the supply chain to the end-user who has to trust that the information received is indeed reliable. There are in the supply chain complexities of different claims, multi-recognition of schemes and different Chain of Custody (CoC) approaches used (mass balance, percentage based).

7. **What are risks in the supply chain in terms of compliance and verification, and how can this be improved?**

a. **What are specific points of attention to assure that the data sent through the supply chain to the end-user is complete and reliable?**

Explanation for question 8: For compliance and verification, robust data are needed. Data collection and verification methods range from tools like satellite monitoring to more traditional data collection methods like field audits and surveys, depending on the issue and the context

8. **Optional question: Which innovations (e.g., technical approaches, databases, remote sensing) are at hand which could contribute to robust data collection and verification, and for which criteria can they be used? Which of these innovations could also contribute to reduce the burden of data collection and verification?**

Explanation for question 9: It is considered good practice for risk and auditing assessments that interested stakeholders have opportunities to contribute to and reflect upon the risk characterization

9. **Optional question: Should stakeholder consultation be a prerequisite for compliance and verification of (some of the) sustainable forest management criteria and why (not)?**

Explanation with question 10: Under the EU Taxonomy, conducting Due Diligence is used to show 'negligible risk' for the DNSH (do not significantly harm) criteria. Due Diligence is also conducted under the EUTR and proposed as approach for compliance in the EU Communication "Stepping up EU action against deforestation'

10. **Optional question: Does the increasing use of Due Diligence have a positive or negative impact on the credibility of sustainability compliance and verification, and why?**

A) **How does the increased use of Due Diligence in EU policies influence the playing field of co-regulation in Europe, and how do certification schemes respond to this development?**

Block III C&V under the RED2: options for improvement

11. **Do you think that the RED2 is at this moment strong enough to ensure the robustness and credibility of certification schemes used to prove compliance with the sustainability criteria for forest biomass?**

If no, where lie the main challenges - and how can these be improved?

12. **How can certification schemes further improve the robustness and credibility of certification schemes used to prove compliance with the sustainability criteria for forest biomass?**

13. What can other stakeholders do (Please give concrete examples)?

- **National governments?**
- **Accreditation bodies (e.g., the BLE in Germany)?**
- **International organizations (e.g., ISEAL, ISO)?**
- **Private sector?**
- **Science**

14. Do you have any other issues or suggestions?

Further Information

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www.ieabioenergy.com

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