



NL Sustainability framework advice Final report

Prepared for:



Rijksdienst voor Ondernemend
Nederland

Submitted by

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Project nummer: 224164

08-12-2023

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1. Introduction

The Netherlands is drafting new legislation that can be used to demonstrate the sustainability of **bio-based raw materials for all applications**. The intention is, to the extent possible, to follow the sustainability requirements for biofuels, bioliquids and biomass fuels from the EU Renewable Energy Directive (RED)¹. This approach aims to ensure a consistent level of sustainability across sectors of the economy and to enable economic operators to make the most effective use of voluntary schemes that are already recognised by the European Commission (EC) to demonstrate compliance with the REDII sustainability criteria.

The new Dutch Sustainability Framework² goes beyond the REDII sustainability system in two ways:

- Additional (“NL top”) **sustainability criteria** – the new legislation will also include water availability, ground and surface water quality, good agricultural practice and forest management, and responsible waste management (social sustainability criteria will be included later).³
- Additional **sectors** – the chemical industry and construction sectors (building materials) will be included, in addition to the energy sector. Food, feed, fibers (textile, paper, cardboard) and transport are not included.

The sustainability criteria were presented in a **letter to the parliament** in June 2021. In addition to the sustainability criteria, the Dutch Sustainability Framework will also include criteria on chain of custody, auditing and scheme governance (“assurance”). The **REDII assessment protocol** for voluntary schemes sets out detailed requirements on these aspects. A key consideration, however, is to determine whether these requirements are also suitable for the bio-based industry and construction sectors, or whether a differentiated approach for these sectors is needed.

As a next step, the Ministry of I&W will now need to develop the legislative framework. RVO is supporting the implementation and design of the framework. To ensure a robust, yet pragmatic, approach to compliance, the Netherlands wants to make the maximum use of existing voluntary schemes and EC recognition. The intention is that economic operators will have to be certified to a voluntary scheme to demonstrate that the biomass they use complies with the sustainability criteria. A Dutch committee will approve voluntary schemes for the Dutch Sustainability Framework. Voluntary schemes that are approved by the EC for the REDII will only need additional Dutch approval for the NL Top criteria.

This report provides advice to RVO to further develop the Dutch framework to recognize voluntary schemes, focusing on three main parts: the **formulation of the additional Dutch sustainability criteria** (chapter 2), the **rules for the chain of custody** (chapter 3) and the **rules for voluntary scheme assurance** (chapter 4). **In each case, the aim is to provide advice to RVO to ensure the Dutch Sustainability Framework can be pragmatically but robustly implemented and maximise the use of existing EC-recognised voluntary schemes.**

¹ The currently implemented version is Directive 2018/2001 or “REDII”. Note that the final text of the recast of this Directive, referred to as the “REDIII”, was published on 31 October 2023 and includes some updates to the sustainability criteria, particularly on the inclusion of old growth forests as no-go areas and requiring a cascading use of biomass (i.e. that woody biomass should be incentivised towards materials where possible before energy).

² English translation of the ‘Intergraal Duurzaamheidskader’.

³ The criteria were developed by The Social and Economic Council (SER), an organisation that advises the Dutch government and Parliament on social and economic policy.

2. Sustainability criteria (NL top criteria)

This chapter focuses on the **additional** environmental sustainability criteria in the Dutch Sustainability framework, the so-called “NL top criteria”.⁴ An English translation of the NL top criteria is included in Appendix A (Table 11). The aim of this chapter is to provide advice to RVO on the formulation of the additional Dutch sustainability criteria, and how they can be pragmatically but robustly implemented to maximise the use of existing EC-recognised voluntary schemes in the context of the Dutch Sustainability Framework.

2.1 Analysis of the NL top criteria

The NL top criteria cover the topics of **water availability, water quality, good agricultural and forestry management practices and responsible waste management**. These are all highly relevant sustainability issues and – at the principle level – they are covered as part of international sustainability frameworks such as the Sustainable Development Goals and the Global Bioenergy Partnership or ISO standard 13065 sustainability criteria for bioenergy (see Appendix B for further details). However, with only one partial exception⁵, **the NL top criteria are not covered by the REDII** sustainability criteria that are mandatory for economic operators using bioenergy in the EU (see Appendix B). Furthermore, whilst some of the voluntary schemes recognised by the EC for the REDII include broader sustainability requirements on soil and water protection, **relying on voluntary schemes currently recognised by the EC will not cover all of the NL top criteria as they are currently drafted**.

Appendix C provides a detailed analysis of the NL top criteria, per criterion, including who is responsible for the risk, how the criterion is covered by voluntary schemes, whether the criterion is auditable and the pros and cons of keeping each criterion. The findings are summarised in Table 1. Those findings show that in most cases the biomass producer is responsible for the risk – the exception occurs where the criteria mentions impacts outside the production unit, which the biomass producer can only partially influence. Furthermore, **almost all of the NL top criteria are covered in some way by at least one existing voluntary scheme that is operating in either the bio-based chemical or material market. This indicates that the criteria are auditable, but there are no schemes (of the ones assessed) that cover all of the NL top criteria**.

The benchmark of the current NL top criteria against several key voluntary schemes that are used in the market today revealed that the wording of the NL top criteria is often very specific. The benchmark results showed a number of “partial” compliances where the topic of the criteria is addressed by the voluntary scheme, but all the aspects of the criteria wording are not covered. The analysis therefore identified suggestions for how the phrasing of the criteria might be adjusted, both to streamline the overall list of criteria and in some cases to provide a more high-level wording to allow for slightly different approaches to taken by different voluntary schemes. For example, the original principle 5 includes several criteria

⁴ Note that NL principles 7, 8, 9 and 13 are directly from the REDII and therefore can be covered directly by EC-recognised voluntary schemes. The social principles (1, 3, 10 and 11) are also excluded from the scope of this paper, as well as principle 12 on indirect land-use change (ILUC) which is currently proposed to be included within principle 8 on carbon stock.

⁵ NL top criteria 6.2 says “Agricultural waste shall be reduced, reused and/or recycled. The use of agricultural residues shall not compromise the function of local use of by-products, soil organic matter or soil nutrient balance” Article 29(2) of the REDII aims to address the same issue related to a sustainable level of harvesting of agricultural residues, but the REDII does not require agricultural wastes to be reduced and only indirectly addresses alternative local uses of by-products in the criteria against which the EC considers materials for inclusion in the advanced biofuel feedstocks list in Annex IX.

which aim to reduce pesticide use, but they make reference to different lists of pesticides. The recommendation is to streamline this into one criterion on limiting pesticide use.

Presentationally, it is also suggested to separate the criteria that apply to forest biomass from those that apply to agricultural biomass and streamline the wording wherever possible. (For example, the second half of criteria 5.1 for forestry is the same as 5.5 for agriculture, so they could be combined.) This would make the criteria easier to communicate and easier for stakeholders to understand. It is also easier for economic operators to quickly identify which criteria are relevant for their type of biomass.

A recommendation for rephrasing the criteria, based on the analysis, is included in Table 2. An updated benchmark of the voluntary schemes **against the rephrased criteria** is included in Table 3 in section 0.

An alternative to rephrasing the current NL criteria which can have the same effect, is to keep the criteria worded as they are now, but allow more flexibility for the panel assessing schemes to accept alternative wording or to accept schemes that have some partial compliances. This, and other options are discussed in the recommendations in section 2.3.

Table 1: Summary of analysis of NL Top criteria

Principle	Criteria	International systems	REDII	Responsibility	VS	Reflections on phrasing
		<i>Relevance</i>		<i>Proportionality</i>		
Principle 2: Water availability	2.1 Forest Biomass: The water balance of both groundwater and surface water in the production unit, as well as downstream outside the production unit, is at least maintained and improved where necessary.	Yes	No	Partially	Yes (most)	For forestry, for surface water, the risk relates more to clear cutting which increases downstream risk of flooding. Hard to actually check groundwater levels and harder to audit downstream water users as this is out of the control of the economic operator.
	2.2 Agricultural biomass: Surface and groundwater use in agricultural land is less than the natural restoration of the (ground) water system	Yes	No	Yes	Yes (some)	Is there a reason why 2.1 and 2.2 are worded differently when they aim for the same thing? The agricultural criterion does not mention downstream. Wording of 2.1 is better “maintained or improved where necessary”. You would not always want natural restoration of the water to be higher than water use, or eventually you would end up with too much water.
	2.3 Agricultural biomass: Negative effects on water availability on other users and ecosystems are prevented or minimized.	Yes	No	Partially	Yes (most)	Unclear why 2.1 and 2.2/2.3 are worded differently. This one may be redundant as 2.1 and 2.2 already strive to realise 2.3. More closely aligning wording / form of criteria would simplify the criteria set-up. Harder to actually audit effects on other users as this is out of the control of the economic operator.
Principle 4: Quality of ground and surface water	4.1 Agricultural and forest biomass: Negative impacts of cultivation of agricultural or forest biomass, regarding water quality for other	Yes	Partial	Partially	Yes (most)	Hard to measure effects on other users as out of control of economic operator

Principle	Criteria	International systems	REDII	Responsibility	VS	Reflections on phrasing
		<i>Relevance</i>		<i>Proportionality</i>		
	users and ecosystems, are prevented or minimized					
Principle 5: Good agricultural practice and forest management	5.1 Forest biomass: The use of chemicals is only allowed if maximum use of ecological processes and sustainable alternatives prove to be insufficient. The use of pesticides classified by the World Health Organization as type 1A and 1B and chlorinated hydrocarbons is not permitted.	Yes	No	Yes	Yes (most)	All schemes cover pesticides but in different ways, and the WHO classification is dated, thus a different wording or more flexible approach might be advised
	5.2 Agricultural biomass: The use of chemical agents shall be minimized wherever possible by applying integrated pest management (IPM) and other sustainable agricultural practices.	Yes	No	Yes	Yes (all)	Wording sounds like IPM is required, which may be quite strict. May wish to take more flexible approach (but seems to be well covered by schemes)
	5.3 Agricultural biomass: Only registered plant protection products are used. The application of agricultural chemicals is documented and all operations, storage, collection and disposal of chemical waste and empty containers are monitored to ensure compliance with good practices. Chemicals are stored and disposed of safely.	Yes (some)	No	Yes	Yes (all)	
	5.4 Agricultural biomass: The use of pesticides listed in the Rotterdam Convention and in the Stockholm	Yes	No	Yes	Yes (partially)	Several criteria related to pesticides – wording and approach could be streamlined

Principle	Criteria	International systems	REDII	Responsibility	VS	Reflections on phrasing
	Convention on Persistent Organic Pollutants (POPs) is not allowed.	<i>Relevance</i>		<i>Proportionality</i>		
	5.5 Agricultural biomass: The use of pesticides classified by the World Health Organization as type 1A and 1B and chlorinated hydrocarbons is not allowed.	Yes	No	Yes	Yes (partially)	WHO classification is dated, thus a different wording or more flexible approach might be advised. Several criteria related to pesticides – wording and approach could be streamlined For example, the text that refers to this from 5.1 could be moved to here and this one be made applicable to both forest and agriculture
	5.6 Agricultural biomass: The producer applies good agricultural practices on his land: -Soil quality is maintained and where possible improved through good nutrient balance. -Erosion is prevented, through good agricultural practices. -(Bio)diversity on the land: crop rotation and natural vegetation around springs and along natural watercourses is maintained and, where possible, restored.	Yes	No	Yes	Yes (partially)	Only covered in full by one voluntary scheme, more flexible wording could be considered. For example, biodiversity around watercourses is not always specifically covered and “where possible” is hard to audit
Principle 6: Responsible waste management	6.1 Agricultural and forest biomass: The generation of inorganic waste and litter shall be prevented or collected, stored at the specified location(s) and disposed of in an environmentally responsible manner.	No	No	Yes	Yes (some)	“environmentally responsible” is vague

Principle	Criteria	International systems	REDII	Responsibility	VS	Reflections on phrasing
		<i>Relevance</i>		<i>Proportionality</i>		
	6.2 Agricultural biomass: Agricultural waste shall be reduced, reused and/or recycled. The use of agricultural residues shall not compromise the function of local use of by-products, soil organic matter or soil nutrient balance.	Only GBEP	Partially ⁶	Farmer responsible for appropriate harvesting rate of agri residues. Use of agri residues more a question for policy makers or biomass end users.	Yes (some)	“Reduce, reuse, recycle” may not make sense in the context of agricultural wastes if these can be used for chemicals or energy. Reduction of inorganic wastes is already covered above.

⁶ Use of by-products is covered in definition of wastes and residues / criteria for Annex IX. Article 29(2) covers sustainable harvesting of agricultural residues.

Table 2. Suggestion for rephrasing NL top criteria

Principle	Current NL criteria	Proposed (re)phrasing NL Criteria (Bold text indicates changes)	Rationale and reference for new criteria
Principle 2: Water availability	2.1 Forest Biomass: The water balance of both groundwater and surface water in the production unit, as well as downstream outside the production unit, is at least maintained and improved where necessary	2.1 Agricultural & forest biomass: The water balance is at least maintained and improved where necessary to ensure that negative effects on water availability on other users and ecosystems are prevented or minimized	Combine and streamline criteria 2.1-2.3. Remove explicit reference to groundwater and surface water as they are not always both explicitly mentioned in voluntary schemes.
	2.2 Agricultural biomass: Surface and groundwater use in agricultural land is less than the natural restoration of the (ground) water system		Combine into 2.1
	2.3 Agricultural biomass: Negative effects on water availability on other users and ecosystems are prevented or minimized		Combine into 2.1
Principle 4: Quality of ground and surface water	4.1 Agricultural and forest biomass: Negative impacts of cultivation of agricultural or forest biomass, regarding water quality for other users and ecosystems, are prevented or minimized	4.1 Agricultural & forest biomass: Negative impacts of cultivation of agricultural or forest biomass, regarding water quality are prevented or minimized	Remove 'for other users' to simplify
Principle 5: Good agricultural practice and forest management	5.1 Forest biomass: The use of chemicals is only allowed if maximum use of ecological processes and sustainable alternatives prove to be insufficient. The use of pesticides classified by the World Health Organization as type 1A and 1B and chlorinated hydrocarbons is not permitted	5.1 Agricultural & forest biomass: responsible and science-based operational practices such as integrated pest management (IPM) will be implemented to reduce and/or limit pesticide use to instances where ecological processes and sustainable alternatives prove insufficient. The use of pesticides listed in the Rotterdam Convention and in the	Combine and streamline criteria 5.1, 5.2 and 5.4. 'Responsible and science-based operational practices' were taken from the CORSIA sustainability criteria for better coverage of principle. The use of IPM is suggested instead of required to increase flexibility. Type 1A and 1B WHO pesticides were swapped for those listed in Rotterdam and

Principle	Current NL criteria	Proposed (re)phrasing NL Criteria (Bold text indicates changes)	Rationale and reference for new criteria
		<p>Stockholm Convention on Persistent Organic Pollutants (POPs) is not allowed. If these are currently used this should be phased out within a reasonable timeframe.</p>	<p>Stockholm conventions as these categorizations are more up-to-date. The phasing out of their use is allowed for by multiple voluntary schemes.</p>
	<p>5.2 Agricultural biomass: The use of chemical agents shall be minimized wherever possible by applying integrated pest management (IPM) and other sustainable agricultural practices.</p>		<p>Combine into 5.1</p>
	<p>5.3 Agricultural biomass: Only registered plant protection products are used. The application of agricultural chemicals is documented and all operations, storage, collection and disposal of chemical waste and empty containers are monitored to ensure compliance with good practices. Chemicals are stored and disposed of safely.</p>	<p>5.3 Agricultural biomass: Only registered plant protection products are used. The application of agricultural chemicals is documented and all operations, storage, collection and disposal of chemical waste and empty containers are monitored to ensure compliance with good practices. Chemicals are stored and disposed of safely.</p>	<p>No rephrasing needed</p>
	<p>5.4 Agricultural biomass: The use of pesticides listed in the Rotterdam Convention and in the Stockholm Convention on Persistent Organic Pollutants (POPs) is not allowed.</p>		<p>Combine into 5.1</p>
	<p>5.5 Agricultural biomass: The use of pesticides classified by the World Health Organization as type 1A and 1B and chlorinated hydrocarbons is not allowed.</p>		<p>Redundant as WHO pesticides classification is outdated (limiting use of pesticides is all combined into 5.1)</p>
	<p>5.6 Agricultural biomass: The producer applies good agricultural practices on his land: -Soil quality is maintained and where</p>	<p>5.4 Agricultural biomass: Good agricultural practices shall be implemented to maintain or</p>	<p>Adapted from CORSIA for simplicity</p>

Principle	Current NL criteria	Proposed (re)phrasing NL Criteria (Bold text indicates changes)	Rationale and reference for new criteria
	<p>possible improved through good nutrient balance.</p> <p>-Erosion is prevented, through good agricultural practices.</p> <p>-(Bio)diversity on the land: crop rotation and natural vegetation around springs and along natural watercourses is maintained and, where possible, restored.</p>	<p>enhance soil health and biodiversity</p>	
<p>Principle 6: Responsible waste management</p>	<p>6.1 Agricultural and forest biomass: The generation of inorganic waste and litter shall be prevented or collected, stored at the specified location(s) and disposed of in an environmentally responsible manner.</p>	<p>6.1 Agricultural & forest biomass: The generation of waste and litter shall be prevented or collected, stored at the specified location(s) and disposed of in a responsible manner so that environmental contamination is prevented</p>	<p>Remove explicit mention of inorganic as this criteria should cover reduction of all wastes.</p> <p>Make the intention (to avoid contamination) more specific to reduce vagueness.</p>
	<p>6.2 Agricultural biomass: Agricultural waste shall be reduced, reused and/or recycled. The use of agricultural residues shall not compromise the function of local use of by-products, soil organic matter or soil nutrient balance.</p>	<p>6.2 Agricultural biomass: Agricultural best management practices for residue collection will be implemented to maintain or enhance soil health</p>	<p>Remove waste reduction to avoid duplication with 6.1.</p> <p>Agricultural residue criteria adapted from CORSIA</p>

2.2 Benchmark voluntary schemes against NL top criteria

Below is a benchmark of several voluntary schemes **against the proposed rephrased NL top criteria**. Note that the distinction is made in the benchmark between voluntary schemes that cover mainly agricultural biomass (ISCC Plus, REDCert2 and RSB) and voluntary schemes that cover forestry biomass (FSC and PEFC), regardless of the end use sector.

Table 3: Benchmark against rephrased NL top criteria

Principle	Rephrased NL top criteria	ISCC Plus (EU)	REDCert2	RSB	FSC	PEFC
Principle 2: Water availability	2.1 Agricultural & forest biomass: The water balance is at least maintained and improved where necessary to ensure that negative effects on water availability on other users and ecosystems are prevented or minimized	Yes	Yes	Yes	Yes	Yes
Principle 4: Quality of ground and surface water	4.1 Agricultural & forest biomass: Negative impacts of cultivation of agricultural or forest biomass, regarding water quality are prevented or minimized	Yes	Yes	Yes	Yes	Yes
Principle 5: Good agricultural practice and forest management	5.1 Agricultural & forest biomass: responsible and science-based operational practices such as integrated pest management (IPM) will be implemented to reduce and/or limit pesticide use to instances where ecological processes and sustainable alternatives prove insufficient. The use of pesticides listed in the Rotterdam Convention and in the Stockholm Convention on Persistent Organic Pollutants (POPs) is not allowed. If these are currently used this should be phased out within a reasonable timeframe.	Yes	Partial: Allows for the use of Rotterdam convention chemicals if no alternatives are available	Yes	Yes	Partial: Does not mention Rotterdam and Stockholm convention pesticides

Principle	Rephrased NL top criteria	ISCC Plus (EU)	REDCert2	RSB	FSC	PEFC
	5.3 Agricultural biomass: Only registered plant protection products are used. The application of agricultural chemicals is documented and all operations, storage, collection and disposal of chemical waste and empty containers are monitored to ensure compliance with good practices. Chemicals are stored and disposed of safely.	Yes	Yes	Yes	Agricultural biomass not in scheme scope	Agricultural biomass not in scheme scope
	5.4 Agricultural biomass: Good agricultural practices shall be implemented to maintain or enhance soil health and biodiversity	Yes	Partial: No mention of on-site biodiversity	Yes	Agricultural biomass not in scheme scope	Agricultural biomass not in scheme scope
Principle 6: Responsible waste management	6.1 Agricultural & forest biomass: The generation of waste and litter shall be prevented or collected, stored at the specified location(s) and disposed of in a responsible manner so that environmental contamination is prevented	Yes	No	Yes	Partial: no mention of inorganic waste, prevention or storage	Partial: no mention of preventing waste generation
	6.2 Agricultural biomass: Agricultural best management practices for residue collection will be implemented to maintain or enhance soil health	Yes	Yes	Yes	Agricultural biomass not in scheme scope	Agricultural biomass not in scheme scope

2.3 Policy options

The NL top criteria cover the topics of water availability, water quality, good agricultural and forestry management practices and responsible waste management. These are all relevant sustainability issues relating to the production of primary agriculture and forestry biomass. The issues are covered by many voluntary schemes. However, **the NL top criteria are not covered by the REDII** and therefore not automatically covered by EC-recognised voluntary schemes. Furthermore, there **are no schemes (of the key schemes assessed in this project) that cover all of the NL top criteria** (even after the criteria are rephrased – see Table 3).

Therefore, it is important to consider the options available to implement the NL top criteria for the additional non-energy sectors. The NL criteria should contribute to addressing important sustainability risks as the implementation of a specific Dutch system will incur costs above the existing EC-recognised voluntary schemes. As the criteria stand, an economic operator wanting to demonstrate compliance would have to be certified to more than one scheme, or combine certification with a different approach to demonstrate compliance with the criteria not covered by that scheme to ensure that they comply with all of the NL top criteria. Both options would add to the costs and administrative burden for economic operators.

Certification is not the only option to address the NL top criteria. However, we consider it to be the most realistic and robust. There are two main alternatives to voluntary scheme certification. One could be a **country-level approach** where the Netherlands assesses whether countries (where biomass is produced) cover the sustainability issues in their national legislation. However, this would require significant resources from the Dutch authorities to set up, and there can be a difference between legislation that is place and how well the legislation is enforced and monitored on the ground. The latter is more difficult to assess and therefore difficult to guarantee that sustainability risks are always addressed by taking this approach. The other alternative is to require **economic operators to report on compliance** with the NL top criteria. However, as the sustainability risks occur at the biomass production stage, asking the chemicals or construction companies to collect and verify this information from the upstream biomass producers in their supply chain outside a certification framework can be very challenging and burdensome. Furthermore, the NL top criteria relate to sustainability aspects that need to be checked on the ground and cannot easily be checked remotely (unlike e.g. land use change in the REDII context, which can to a greater extent be checked through satellite imaging / remote sensing). **Therefore the NL top criteria lend themselves better to up-front certification.**

To make maximum use of the existing voluntary schemes, we would see the following options that could be applied under the Dutch Sustainability Framework. **Note that the options described are not mutually exclusive.**

1. Require voluntary schemes to adjust their criteria to be fully in-line with the Dutch Sustainability Framework or to develop a module specific for the Dutch Sustainability framework.

This could be considered a strict approach, ensuring the highest level of sustainability. However no voluntary scheme will currently be able achieve this.–There is precedent for schemes adapting their criteria to be in line with national legislation or developing specific national modules. For example before biomass sustainability requirements were introduced at the EU level, the SBP scheme has operated different versions of their solid biomass scheme for the Dutch, UK, Danish and Belgian wood pellet markets. The ISCC Plus scheme

also offers several different modules and voluntary add-ons⁷ covering different sustainability issues for economic operators who are interested to make different types of claims. However, such a variety of different claims from different schemes – and even within the same scheme – leads to complexity and fragmentation in the market.⁸ Furthermore, the willingness from schemes to develop different modules cannot be guaranteed. Schemes tend to be more willing to adapt or introduce new modules for early developing markets (such as bio-based chemicals) where fewer established schemes exist, rather than for markets where international trade in sustainably certified material is more well established (such as wood use in construction).

2. Rephrase the NL top criteria to make them less specific and therefore enable more schemes to cover the aspects with their current criteria, whilst still ensuring all the aspects are addressed.

Rephrasing some of the NL top criteria would mean that compliance can be more readily facilitated by the current voluntary scheme market. For some of the criteria where the relevance is lower (see Table 1), these could be removed from the top criteria with approval from policy makers. However, this approach would require amendments to the already-agreed list of criteria published in the letter to parliament so could be politically challenging. A proposal to rephrase the criteria is made in Table 2 and a benchmark of several voluntary schemes against these rephrased criteria is included in Table 3.

3. Set up the Dutch recognition framework in a flexible way that does not require all criteria to be met for a voluntary scheme to be recognised. This could have several variations:

- a. Require a **minimum number** of criteria to be covered by schemes for them to be used (but without specifying which of the criteria need to be included in that minimum)
- b. Set **core criteria** that must be covered for a voluntary scheme to be recognized and **non-core criteria** that are optional / recommended
- c. Set a **trajectory / growth path** by which time all criteria must be covered in order for a voluntary scheme to (continue to) be recognised

Variations of these approaches have all been applied under the original UK RTFO for biofuels. Being more flexible to accept schemes that do not fully and precisely cover all of the NL top criteria from the start allows the system to be more readily facilitated by the current voluntary scheme market. However, it means that not all issues are addressed by all schemes, at least from the start. Setting a trajectory or growth path towards higher coverage of the criteria ensures the level of sustainability desired can be achieved over time, whilst allowing the market time to develop. For the NL top criteria, we would recommend the approach to set a minimum number of criteria, rather than defining core criteria as there is no clear evidence to define any of the criteria as being more important than another. Furthermore, the aim of this third policy option is to ensure that the system can be up and running quickly, and defining a minimum number of criteria is much faster and less prone to debate than defining core criteria.

⁷ <https://www.iscc-system.org/certification/iscc-certification-schemes/iscc-voluntary-add-ons/>

⁸ This conclusion is also supported by research done in the framework of IEA Task 45. See: <https://task45.ieabioenergy.com/>

4. Require economic operators to use a combination of existing schemes to ensure all criteria are covered

This option can ensure full compliance with all NL top criteria. However, economic operators would have to pay for more than one audit, and potentially also more than one set of scheme fees, which would be burdensome, especially if the “extra” scheme certification is only needed for one or two missing criteria. Certification to an existing scheme could be complemented by gap audit and reporting to RVO on the specific sustainability issues that are not covered by the scheme. However, as mentioned above this is tricky for chemicals and construction companies as the risks occur at the biomass production stage and are not easy to check remotely.

2.4 Advice to RVO

We **recommend first rephrasing the NL top criteria (option #2)** to enable a broader coverage of voluntary schemes, but crucially whilst still **ensuring that all sustainability aspects are still covered**.

Furthermore, we **recommend that NL initially sets out a minimum number of criteria that have to be covered for a scheme to be recognized, with a growth path towards full compliance over time (option #3)**. This ensures that a sufficient number of voluntary schemes operating in the market today can already be used, whilst setting a trajectory towards a higher level of sustainability over time. Referring to the benchmark in Table 3, we would recommend that for a scheme to be recognized in the context of the Dutch framework, it needs to cover a minimum of four (out of seven) NL top criteria for agricultural biomass or two (out of four) NL top criteria for forest biomass. By, for example 2026, a scheme could be expected to cover all criteria to be recognized. Although we would recommend RVO to closely monitor the development of the market, of voluntary schemes and of similar policies in this area and to keep the timeframe under review.

These options would not prevent a voluntary scheme adapting their criteria or developing a new NL-specific module (option #1) and there is also nothing to prevent an economic operator choosing to be certified to more than one scheme (option #4). However, the option of facilitating reporting of gap audits would add to the burden of the economic operators and the government so would be a less preferred option.

For **forestry schemes used in the construction sector, the growth path option will be more challenging**, as it is less realistic to expect these established schemes to update their criteria for one market. This is something that RVO should closely monitor and also engage with the industry and schemes to discuss further. For this sector specifically, we **recommend as much as possible to make reference to other existing Dutch systems to recognise sustainable forestry**, for example in the context of the **Timber Procurement Assessment Committee (TPAC)** or the SDE++ and EU ETS. The construction sector has a long track record of using especially the FSC and PEFC schemes (amongst some others) which certify woody biomass. Whilst PEFC has applied to the EC for recognition in the context of the REDII and might be expected to be recognised soon, FSC has not applied. Furthermore, even if PEFC is recognised, it is anticipated that only a small part of the market focused on energy would choose to use the PEFC RED module. Ensuring a good basis for recognition of these forestry sustainability schemes would greatly facilitate sustainability claims for the construction sector. The Netherlands (and for reference, also the UK) have established mechanisms for recognising forestry sustainability schemes in the context of wood used for biomass for heat and power. Referring to those mechanisms would give a solid basis for recognizing the forestry schemes against the equivalent to the REDII core sustainability criteria for energy.

When recognising schemes in the context of the Dutch Sustainability Framework, it will be important to be specific about which **version** of a voluntary scheme is recognised. This can be at the level of recognising specific voluntary scheme standards or modules, but does not necessarily have to be at the level of the claim made. For economic operators, however, it will be important for them to ensure that if 100% of their material reported under the NL framework needs to comply with the relevant scheme standard, then they need to use a claim that facilitates 100% of the material being compliant.

Lastly, one should also consider that as the Netherlands expands the use of bio-based materials, it is vital to set a robust sustainability framework to ensure that the expansion of biomass use is sustainable. However, **setting more stringent sustainability requirements for non-energy uses of biomass than for energy uses may not be desirable**. There is an important role for the use of biomass for energy, but to support the cascading principle, the limited biomass resources should be prioritised for the hard-to-abate and hard-to-defossilise sectors.⁹ In general, chemical and material uses of biomass have a higher economic and environmental value than energy use. Thus, setting higher sustainability requirements for chemicals and materials may indirectly incentivise energy use over chemical or material use, which would be against the cascading principle. Furthermore, setting **additional sustainability requirements (beyond the REDII) will impact biomass availability for the Netherlands because the Dutch system would be more stringent than other countries**, making the opportunity for the Dutch sectors to upscale the bioeconomy for chemicals and building materials more difficult. This puts emphasis on the need to ensure that the policy framework makes the best use of existing voluntary schemes and mechanisms in operation in the market, to balance the need for a high level of sustainability assurance with the need to bring the market along with you and ensure a level playing field for biomass used in different sectors.

⁹ Note that the REDIII will require member states to implement the cascading principle to ensure that woody biomass is used according to its highest economic and environmental added value, being prioritised first for wood-based products, before being recycled, burned for energy or disposed of.

3. Chain of custody

This chapter focuses on how sustainability information is transferred down the supply chain. The aim is to review the extent to which the chain of custody models used in the non energy sectors compare to the REDII mass balance approach and, conversely to what extent the REDII mass balance approach could be directly used by the additional non-energy sectors that will be included in the scope of the Dutch sustainability framework. The analysis considers whether flexibility will be necessary to accept different chain of custody approaches for the non energy sectors. The aim is for the requirements for the Dutch sustainability framework to be robust and practical, to make best use of existing EC-recognised voluntary schemes, and to not contradict the REDII requirements.

3.1 Introduction to chain of custody

The method by which a connection is made between information or claims concerning raw materials or intermediate products and claims concerning final products is known as the ‘**chain of custody**’.

The REDII mass balance requirements

For the purpose of demonstrating compliance with the sustainability requirements, the REDII requires a so-called **mass balance** chain of custody approach to be used for biomass sustainability characteristics transferred down energy-related supply chains. The chain of custody needs to include all the stages of the supply chain from the biomass origin to the party who is making the claim. If there is a break in the chain where one party is not checked, no claim can robustly be made on the final product.

It should be noted that the chain of custody rules in the REDII are solely applicable to biomass, since fossil energy does not fall within the framework of the REDII. Therefore, fossil material is excluded from the mass balance. In the case that fuels are produced from a physical mixture of fossil and biomass materials, and the process produces more than one product, then allocation is based on the physical biomass share of the product(s). Rules to determine the biomass content are published in the [Delegated Regulation on co-processing](#)¹⁰ (which, at the time of writing, is in the process of being implemented in EC-recognised voluntary schemes). For this report, mass balance is discussed in relation to how allocate sustainability information within the physical bio-based streams, but properly defining rules to allocate the share of fossil and bio-based content is also an important prerequisite.

At its most fundamental level, a **mass balance** chain of custody system allows (bio-based) materials with different sustainability characteristics to be physically mixed in the supply chain as long as the sustainability characteristics are “balanced” administratively at each step in the chain. In other words, at each step in the chain the **sum of the units in must equal the sum of the units out**, taking into account any conversion factors. Sustainability characteristics are allocated to outgoing consignments and accompany the consignments as

¹⁰ The co-processing delegated regulation applies to biofuel and biogas for transport, but the content is also relevant for bio-based chemicals as these will often be produced in a processing facility together with fossil material, resulting in a homogeneous output that is part-bio and part-fossil. The final delegated regulation requires that the economic operator calculate the **actual bio-based content of the different outputs** from the process. Different methods can be used including mass or energy balance, yield methods, or radiocarbon (¹⁴C) testing, but even if the mass or energy balance methods are used, **different conversion factors need to be applied to the different outputs** of the process, based on initial radiocarbon testing.

they are passed down the chain so that the party placing the product on the market can make an appropriate sustainability claim.

Crucially in a mass balance system, the **transfer of sustainability characteristics needs to be accompanied by a physical transfer of material**, unlike a book and claim system, in which the sustainability claim can be traded separately to the physical material. REDII¹¹ Article 30 sets out the basic mass balance conditions used for bioenergy supply chains in the EU (Box 1). Note that the mass balance definition in the original REDI¹² Article 18 was slightly simpler and did not include point b, which is also less relevant for non-energy sectors.

Box 1: REDII Article 30(1)

“... [Member States] shall require economic operators to use a mass balance system which:

- a) Allows consignments of raw material or fuels with differing sustainability and greenhouse gas emissions saving characteristics to be mixed for instance in a container, processing or logistical facility, transmission and distribution infrastructure or site;
- b) Allows consignments of raw material with differing energy content to be mixed for the purposes of further processing, provided that the size of consignments is adjusted according to their energy content;
- c) Requires information about the sustainability and greenhouse gas emissions saving characteristics and sizes of the consignments referred to in point (a) to remain assigned to the mixture; and
- d) Provides for the sum of all consignments withdrawn from the mixture to be described as having the same sustainability characteristics, in the same quantities, as the sum of all consignments added to the mixture and requires that this balance be achieved over an appropriate period of time.”

The important elements of the REDII mass balance definition are that:

1. The mass balance records must be kept at a **site level**
2. **Sustainability characteristics (as defined in Annex I of Implementing Regulation 2022/996) must accompany all consignments** incoming and outgoing
3. At each step in the chain, **the sum of the sustainability characteristics incoming must be in balance with the sum of the sustainability characteristics outgoing**
4. The balance must be achieved over an **appropriate period of time**

The EC recently published Implementing Regulation (IR) 2022/996¹³ which aims to **strengthen** and **harmonise** the detail of how the EC-recognised voluntary schemes operate in practice, in the context of energy supply chains. Amongst other topics covered in the IR, Article 19 provides further detail on the implementation of the mass balance system in the

¹¹ Directive 2018/2001/EU: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.328.01.0082.01.ENG&toc=OJ:L:2018:328:TOC

¹² Directive 2009/28/EC: [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 \(europa.eu\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2009.28.01.0001.01.ENG&toc=OJ:L:2009:28:TOC)

¹³ https://eur-lex.europa.eu/eli/reg_impl/2022/996/oj

context of the REDII (see Appendix D for full text). EC-recognised voluntary schemes are currently being updated to ensure they include these detailed requirements¹⁴. Some of the requirements are relevant for all sectors and some are specifically designed for energy sectors and will not be relevant for the additional sectors covered by the NL top criteria (for example rules to deal with how biomethane is mass balanced across a gas grid are mainly relevant for the energy sector).

The IR defines the **minimum set of sustainability characteristics** (Annex I) that need to be passed down the supply chain and sets out what is considered to be an **appropriate period of time** over which to ensure that outputs are balanced with inputs.

It is important to realise that there can be rules on how to allocate sustainability characteristics on different levels. On the level of what the material actually physically is, for instance: is it sunflower oil, or is it palm oil, or any percentage of mixture thereof? But also on the level of what is allowed within one type of material, for instance: physically the material all sunflower oil, but part of it is sustainable and part is not sustainable sunflower oil. The REDII allows for different things on those two levels.

To try to strengthen and harmonise how this is done, Article 19 of IR 2022/996 introduces the concept of a “**product group**” and sets out rules for how sustainability characteristics can be allocated to different product groups down the supply chain. Product group is defined in the IR as:

“Product group’ means raw materials, biofuels, bioliquids, non-gaseous biomass fuels with similar physical and chemical characteristics and similar heating values [...] that all are subject to the same rules set out in Articles 7, 26 and 27 of [the REDII] for determining the contribution of biofuels, bioliquids and biomass fuels towards achieving the targets for renewable energy” (Article 2(21)).¹⁵

Sustainability characteristics cannot be allocated to material in a different product group. This means that for example, under the REDII, sustainability characteristics could be allocated flexibly to outgoing consignments of rapeseed oil and sunflower oil stored on the same site, but ensures that sustainability information relating to used cooking oil cannot be assigned to rapeseed oil stored on the same site, and vice versa, as the oils count towards different sub-targets of the REDII and are considered to be in different product groups. Once the oils are physically mixed for processing into one stream of biodiesel, the sets of sustainability characteristics related to used cooking oil, sunflower oil or rapeseed oil can be flexibly allocated to the outgoing biodiesel as it is one physically homogeneous product.

To give a solid biomass example of product group, sustainability information about different types of wood could be flexibly allocated to outgoing consignments, as long as it is all wood chips, as the type of wood is not a relevant characteristic for energy. However, sustainability information relating to wood chips cannot be assigned to wood pellets stored on the same site and vice versa, as they are physically different.

¹⁴ Full implementation of the Implementing Regulation 2022/996 rules is due to be completed in the EC recognized voluntary schemes by the end of 2023

¹⁵ Note that the IR definition of product group includes which sub-target under the REDII the material counts towards, with the following justification (recital 5): “Raw materials, however, that can be used to produce biofuels, bioliquids and biomass fuels which are subject to different rules concerning their contribution towards the targets for renewable energy should generally not be considered to be part of the same product group as this would risk to undermine the objectives of Directive (EU) 2018/2001, which applies differentiated treatment of biofuels, bioliquids and biomass fuels on the basis of the feedstock they are produced from.” Therefore palm oil (phased out as a high ILUC oil) is considered to be a different product group to sunflower oil (capped under food/feed, but not phased out), which is considered to be a different product group to used cooking oil (Annex IX Part B) etc.

Other common chain of custody models

Whilst the REDII defines a specific set of mass balance rules – and EC-recognised voluntary schemes all need to follow these rules – other chain of custody options are possible and offered by voluntary schemes outside the EU energy sector. Broadly speaking, chain of custody models can be grouped into three categories:

- **Physical segregation** chain of custody systems do not allow materials with different (sustainability) characteristics to be physically mixed. This is used when it is important that the end claim is made on the actual physical material. For physical claims this is the common practice. For example, with organic foods which cannot be physically mixed with non-organic foods, and sometimes for forestry supply chains if, for example, the end user requires a particular type of wood. For sustainability claims that are not physically measurable, the necessity to use physical segregation is less obvious. From an oversight point of view, proving a claim is easier however when no mixing is allowed anywhere in the chain.
- **Mass balance:** Physical mixing is allowed and at each point in the supply chain, “units in” need to be balanced with “units out”. The key element of a mass balance approach is that the physical flows remain connected to claims, like the system prescribed by the REDII. Other design options are possible to operate a **mass balance** system, whilst still respecting the overall principles of a mass balance system that materials can be physically mixed and sustainability characteristics accompany the physical transfer of material down a supply chain. Other design options which are different to the rules under the REDII include for example, claiming a percentage of sustainable material at each step in the supply chain, or achieving the mass balance at a company (multi-site) level rather than a site level.
- At the other end of the spectrum, **book-and-claim** chain of custody systems allow sustainability certificates or claims to be traded independently from the physical material. Such systems are often used for example, in the case of renewable electricity claims or in emissions trading systems. It is also offered as an option by some commodity voluntary schemes, such as RSPO. One advantage is that it allows the end user, e.g. a food manufacturer, to purchase the claim directly from the feedstock producer, thus ensuring the added value for the sustainability claim reaches the grower. A book and claim system can be robust, as long as there is a single point of oversight – such as a database or registry – to ensure the quantities are properly accounted and double claiming is prevented.

Note these three types of chain of custody system become less strict in terms of the claim being physically matched to the material. It is always allowed to use a stricter chain of custody system in a supply chain. For example, if a mass balance system is requested, controlled blending (see below) or physical segregation are also allowed.

The **type of chain of custody approach used affects the nature of the claim** that can be made on the final product. ISEAL provides guidance on best practices related to sustainability claims.¹⁶ For example, a physical segregation allows an economic operator to make a claim that a product “is” or “contains” something, whereas a mass balance system allows a claim that a product is from mixed sources and “supports the sustainable production of...” or it may allow a claim such as “on average x% of content sourced for this product

¹⁶ ISEAL Alliance (2015) Claims Good Practice Guide, Annex F:
[https://www.isealalliance.org/sites/default/files/resource/2017-11/ISEAL Claims Good Practice Guide.pdf](https://www.isealalliance.org/sites/default/files/resource/2017-11/ISEAL%20Claims%20Good%20Practice%20Guide.pdf)

came from sustainable sources”. Similarly, book and claim allows a claim such as the product “supports the sustainable production of x through the purchase of x credits”.

At an international level, ISO 22095:2020¹⁷ sets out terminology and definitions for different chain of custody models. Key definitions from ISO 22095 are included in the following table. ‘Identify preserved’ and ‘segregated’ are types of physical segregation. ‘Controlled blending’ allows mixing of products with different characteristics – like a mass balance system – but is controlled in such a way to enable the **exact proportion of a certain characteristic** to be claimed, such as the actual physical percentage of bio-based content. In that sense it could be considered to be between a physical segregation system and a mass balance system as the materials are mixed, but importantly the physical content is still known.

It is worth noting that the examples of a mass balance system described in ISO 22095 match those used regularly in FSC and PEFC.

Table 4. ISO chain of custody definitions

Chain of custody type	ISO 22095 definition
Identity preserved	Chain of custody model in which the materials or products originate from a single source and their specified characteristics are maintained throughout the supply chain
Segregated	Chain of custody model in which specified characteristics of a material or product are maintained from the initial input to the final output. Note 1 to entry: Addition of material with different characteristics and/or grade to the input is not allowed. Note 2 to entry: Commonly, material from more than one source contributes to a chain of custody under the segregated model.
Controlled blending	Chain of custody model in which materials or products with a set of specified characteristics are mixed according to certain criteria with materials or products without that set of characteristics resulting in a known proportion of the specified characteristics in the final output. Note 1 to entry: This chain of custody model is also referred to as the "single percentage method"
Mass balance	Chain of custody model in which materials or products with a set of specified characteristics are mixed according to defined criteria with materials or products without that set of characteristics. Note 1 to entry: The proportion of the input with specified characteristics might only match the initial proportions on average and will typically vary across different outputs.
Book and claim	Chain of custody model in which the administrative record flow is not necessarily connected to the physical flow of material or product throughout the supply chain. Note 1 to entry: This chain of custody model is also referred to as "certificate trading model" or "credit trading". Note 2 to entry: This is often used where the certified/specified material cannot, or only with difficulty, be kept separate from the non-certified/specified material, such as green credits in an electricity supply

¹⁷ ISO 22095:2020 Chain of custody - General terminology and models. Available at: <https://www.iso.org/standard/72532.html>

3.2 Analysis of chain of custody options for the Dutch sustainability framework

This section provides an overview of the types of chain of custody system used in key voluntary schemes that are used in the chemicals and construction sectors, and an analysis of the extent to which those systems are in line with the REDII definition of mass balance, outlining any inconsistencies with the REDII definition.

Chain of custody options offered in non-energy sectors

For this analysis, we assessed the chain of custody options offered by the following voluntary schemes: ISCC Plus, REDCert², RSB Global, FSC and PEFC. The selection of schemes is based on their importance for the Dutch market, coverage of agricultural and/or forest biomass, and relevance for the different sectors. **Note that voluntary schemes often offer more than one chain of custody type, so when the Dutch authorities are recognising schemes, it will be important to make clear to economic operators if only certain chain of custody options within a scheme are permitted under the Dutch system.**

ISCC Plus¹⁸, REDCert²¹⁹ and RSB Global²⁰ are reviewed here as they aim to certify agricultural crops and residues in the context of bioeconomy, chemicals and materials. All three of these voluntary schemes also have a version that is recognised by the European Commission in the context of bioenergy sustainability in the REDII (ISCC EU, REDcert and RSB EU RED).

FSC and PEFC are long-established voluntary schemes focused on the certification of forest biomass. Currently, they are not recognised by the Commission in the context of the REDII, and therefore cannot be directly used for bioenergy in the EU. However, they are significantly used to certify woody biomass (including forest biomass, waste wood and recycled wood) in the materials and construction sectors.

Most existing bio-based or forestry schemes offer a mass balance type chain of custody system. However, sometimes mass balance is offered as one of a range of options and sometimes the mass balance system can differ to the REDII in the details of how it is implemented. Table 5 shows an overview of the types of chain of custody offered by the voluntary schemes reviewed here.

The findings can be summarised as:

- ISCC Plus, REDcert² and RSB Global all offer a mass balance option that is in line with the REDII. In addition, ISCC Plus offers a more flexible mass balance alternative (credit transfer at the end of a mass balance period and some multi-site (i.e. company-level) mass balancing within country), which we would **not** consider to be fully in line with the REDII and IR 2022/996.
- ISCC Plus and RSB offer controlled blending, which is based on mass balanced but focused on one specific part of the sustainability claim, e.g. percentage of bio-based content or recycled content. **We would consider controlled blending to be in line with the REDII (and co-processing delegated regulation).**

¹⁸ <https://www.iscc-system.org/certification/iscc-certification-schemes/iscc-plus/>

¹⁹ <https://www.redcert.org/en/redcert-systems.html>

²⁰ <https://rsb.org/>

- FSC and PEFC operate very similar percentage and credit based chain of custody systems, which are widely implemented in the forestry industry. The chain of custody systems are based on mass balance (and in line with the mass balance examples included in ISO 22095), but credit transfer at the end of a mass balance period is **not** fully in line with the REDII and IR 2022/996.

Note that PEFC has applied to be recognised by the Commission for biomass use for energy²¹, and will therefore (once recognised) have to offer a REDII-compliant mass balance system. However, it is very likely that the REDII-compliant mass balance system will primarily be applied by those economic operators providing biomass to the energy sector and will not be used by the more established construction or paper/cardboard sectors.

Table 5. Chain of custody options offered by non-energy voluntary schemes

Voluntary scheme	Physical segregation	Controlled blending	Mass balance (REDII compliant)	Mass balance variants (not fully REDII compliant)	Book and claim
ISCC Plus	x	x	x	x	
REDcert ²			x		
RSB Global	x	x*	x		x**
FSC	x			x	
PEFC	x			x	

* RSB refer to 'controlled blending' and 'content ratio accounting'.

** RSB Procedure for Traceability v3.2 from 1 May 2020 suggests a book and claim manual is under development. RSB launched a book and claim manual in March 2023 which is for use for aviation and shipping sectors only. Note that this book and claim system is not recognised by the EC in the context of the REDII and is designed for airlines and corporates making (scope 1 and scope 3) claims about sustainable aviation fuel use downstream from the fuel supplier. From the biomass origin to the fuel supplier, a mass balance chain of custody system has to be used. Therefore, this book and claim system is considered not so relevant in the context of the Dutch Sustainability Framework.

²¹ https://energy.ec.europa.eu/topics/renewable-energy/bioenergy/voluntary-schemes_en

To what extent do the other options meet the REDII definition of mass balance?

The table below summarises key inconsistencies between the other chain of custody systems offered by these voluntary schemes and the REDII definition of mass balance.

Table 6. Inconsistencies with existing systems when compared to REDII

Voluntary scheme	Inconsistencies when compared to REDII compliance system
ISCC Plus	<ul style="list-style-type: none"> For mass balance, credit transfer is allowed at the end of a time period and across sites owned by the same company for processing units and storage facilities (multi-site credit transfer). That level of flexibility is not allowed under the REDII.
REDcert ²	n/a only REDII mass balance offered
RSB Global	<ul style="list-style-type: none"> Suggestion in Traceability standard that book and claim could be permitted, but the book and claim manual suggests this is only for aviation and shipping sectors.
FSC	<ul style="list-style-type: none"> Main chain of custody systems offered are percentage claim and credit systems. Both are forms of mass balance and are determined at site level, but multi site level also allowed as long as sites have common ownership structure and are located in the same country. For percentage claims, a consistent percentage is claimed. The time period over which the input percentage is calculated shall not exceed 12 months (with some exceptions). In a percentage system the maximum amount of FSC Controlled Wood may represent 30% in the end-product. Credit accounts: FSC credits can be accumulated in a credit account and allocated to outgoing consignments. Outgoing consignments have the claim FSC mixed credit and represent 100% responsible sources. Credits are valid for 2 years.
PEFC	<ul style="list-style-type: none"> Main chain of custody systems offered are the percentage method and credit method (in addition to physical separation). Percentage method and credit method are forms of mass balance. Percentage claim allows an organisation to calculate the certified content percentage separately for each PEFC product group and for a specific claim period. A consistent percentage is claimed for the duration of the claim period. The claim period may not exceed 3 months and the input period may not exceed 12 months. Credit method: PEFC credits can be accumulated in a credit account and allocated to outgoing consignments. Credits are valid for 2 years. The operator can choose whether to allocate credits to 100% of an output or a % of the output (e.g. The organisation can use 7 units of credits to sell 7 units as 100% PEFC certified, or to sell 10 units as 70% PEFC certified.)

The main issues identified are very similar for ISCC Plus, FSC and PEFC, which all offer a more flexible type of mass balance than permitted for the energy sector under the REDII. The flexibility has two features that are not permitted under the REDII.

- Economic operators can **transfer “sustainability credits” from one mass balance period to the next** regardless of the amount of physical material in stock at the end of the mass balance period.²²
- For ISCC Plus, processing units and storage facilities can **transfer credits between different sites (so-called multi-site mass balance)** if they are the same company in the same or neighbouring countries, which is against the REDII’s requirement for mass balance to operate strictly at a site level. If multi-site credit transfer is used, that information needs to be included on the certificate and passed down the chain. Similarly, the forestry schemes allow economic operators to **accumulate sustainability credits in an account and allocate them to outgoing consignments whenever they choose**. Credits expire from the account if not allocated after 2 years. Credits can’t be traded independently of a physical material (as in a book and claim system), but that level of flexibility is not allowed under the REDII (especially IR 2022/996 clarifies this is not allowed – Article 19 (g) and (l)). The EC-recognised 2BSvs scheme previously used a very similar credit system under the RED, but they are now required to update their system to harmonise with other schemes, following the publication of IR 2022/996. **The main driver for this requirement from the EC was to harmonise the way the different biofuel schemes operate as there was a perception of unfairness within the sector if different schemes allow different levels of flexibility.** Within a sector, e.g. construction, if all schemes allow companies to operate this way, then there may not be such a perceived issue.

For the **forestry schemes (FSC and PEFC)**, it should also be noted that some of the claims made allow up to 30% “controlled” or low-risk wood. However, it is also possible for economic operators to choose to make a 100% compliant claim under these schemes.

What are the issues with the REDII mass balance rules for the other sectors?

Within the definition of mass balance, different options are possible. The question is to what extent the additional sectors (chemicals and construction) can work with the REDII mass balance rules and what the issues would be for them?

Chemicals sector: from the RVO stakeholder interviews, the chemicals industry expressed concern that the REDII system does not allow **“free allocation”** in the mass balance. Furthermore they expressed concern that **refineries are complex** as they produce for both the chemicals and fuels sectors, so different requirements per end sector would therefore not be workable. **Free allocation** is understood to mean that sustainability characteristics can be allocated freely / flexibly to any outputs. Specifically with bio-based chemicals, when bio-based material is co-processed with a fossil-based material, some stakeholders in the industry would like the flexibility to allocate the bio-based claim to any of the outputs to be able to allocate the bio-based claim to the customer or sector who demand the claim. However, given the rules under the co-processing delegated regulation that require that allocation for any material entering the energy market be based on the physical biomass

²² Implementing Regulation 2022/996 Article 19 (l) requires that “At the end of the mass balance period, the sustainability data carried forward should be equivalent to the physical stock in the container, processing or logistical facility, transmission and distribution infrastructure or site”

share of the product, this leaves little room for allocation between fossil and biomass within combined chains.

This report focuses on how the sustainability information is allocated *within the bio-based share*. Under the REDII, within bio-based material, sustainability information can be allocated flexibly (i.e. free allocation) to outgoing materials as long as they are in the same product group **so the REDII Article 30 text can work for the chemicals sector**. However, it should be noted that the IR 2022/996 definition of product group includes which REDII (sub-)target the feedstock can count towards. This is important for the energy sector because the REDII framework sets differentiated incentives for different types of feedstock. However, without those differentiated incentives (i.e. in the chemicals sector), such a specific definition of product group including the sub-targets would not seem necessary.

Construction sector: The construction sector operates a form of mass balance system and might not fundamentally have issues operating a REDII mass balance system. However, the FSC and PEFC systems used widely in the forestry sector are **very well-established** and have been used by the construction sector for many years. The Dutch sector is only one of many global markets served by these schemes and it is likely that the sector would **strongly resist having to adapt** the way their global supply chain operators are working for one national market.

Ultimately, the different variations of a mass balance system **can all be robust**. They are all fundamentally about ensuring that the sustainability characteristic inputs match the sustainability characteristic outputs at each step in the supply chain. However, the different variations offer different possibilities for companies to more or less flexibly allocate sustainability characteristics to outgoing material. Naturally, most industry stakeholders will prefer options with higher levels of flexibility to allocate sustainability characteristics or bio-based content to those sectors or customers who demand it or have the highest willingness to pay for it. However, **the more flexibility offered, the weaker the link between the claim and the physical material**. Companies are increasingly aware of the need to avoid perceptions of “greenwashing” so making a bio-based claim on a material that is fossil-based – for example if the chemicals sector did not follow the rules in the co-processing delegated act and used full free allocation between bio and fossil content – this is not likely to be accepted by consumers and NGOs.

Some variations on a mass balance can start to look like a book and claim system. For example if the mass balance is determined at a company level where the company operates multiple sites, or if sustainability credits can be accumulated for up to 2 years in an account before being allocated to outgoing material, then there is no credible physical match between the claim and the physical material. This also impacts the claim that can be made on a final product.

For bioenergy, the European Commission has tended towards allowing less flexibility. The new IR introduces a strict definition of product group to avoid that companies can manipulate the mass balance system to use cheaper feedstocks that are capped under the REDII like palm, but claim that the biofuel is from non-capped or even double counted feedstocks, and allocate the less desirable feedstocks to customers outside energy or outside the EU. The co-processing delegated regulation also requires that the actual bio-based claim applied corresponds to the actual bio-based content of the different output streams and we would recommend that this is followed.

3.3 Advice to RVO

We recommend that **RVO requires economic operators to use a mass balance chain of custody system, but to keep the definition of mass balance rather high level to allow different variations to be used** to allow the different sectors to use the systems that are already standard practice in each sector. The definition implemented should be based on the REDII, but also make reference to the mass balance examples in ISO 22095 to provide more detail on how the typical mass balance systems used in the construction sector could be assessed.

RVO should require that voluntary schemes give clear information on the type of chain of custody method used on the proof of sustainability to allow the economic operator to report this to RVO and thus enable RVO to actively monitor the types of chain of custody used in each sector.

We recommend that the **NL sustainability framework accepts the physical segregation chain of custody option** (including identity preserved and segregation), as they are stricter than a mass balance system.

Based on the voluntary scheme assessments, it is **not recommended that book and claim systems are allowed under the NL sustainability framework** as it is out of line with the REDII requirement to operate mass balance system. Only one of the voluntary schemes assessed here (RSB) offers book and claim, and this is only for use downstream of the fuel supplier for airlines to make a claim about sustainable aviation fuel use.

As said, we recommend basing the main definition of mass balance on the REDII definition, as this is more specific than the high level definition in ISO 22095. We recommend implementing the core elements of the REDII mass balance definition, with the following adjustments:

- Exclude REDII Article 30(b) as this is only relevant for energy
- In line with IR 2022/996 Article 19(2)(c), require that sustainability characteristics can only be assigned to the same 'product group' that they originate from. This ensures that sustainability characteristics are allocated to appropriate types of products where the materials could plausibly be mixed. We recommend that the definition of product group from IR 2022/996 is simplified to take out the reference to the REDII targets, which are not relevant to non-energy sectors
- Exclude the more detailed requirements on mass balance from IR 2022/996 Article 19 which are targeted more towards the energy sector specifically
- Delete the explicit reference to "for instance in a container, processing or logistical facility, transmission and distribution infrastructure or site" from Article 30(a) which would revert the definition back to that used in the REDI (Article 18) and could mean that multi-site mass balance is technically allowed. Although it should be noted that the REDI did not allow this as the requirement that the mass balance be operated at a site level was included in a 2010 EC communication²³

The proposed mass balance definition is set out in Table 7 below. The focus is on the key aspects to ensure a robust mass balance system.

²³ <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:160:0001:0007:EN:PDF>

Table 7. Proposed criteria and indicators for mass balance

Criterion	Indicator	Reference
1. Schemes shall operate a mass balance system which:	1.1 Allows consignments with differing sustainability and greenhouse gas emissions saving characteristics to be mixed	REDII Article 30(1)(a) amended (removed “raw material or fuel” and “for instance in a container, processing or logistical facility, transmission and distribution infrastructure or site”)
	1.2 Requires information about the sustainability and greenhouse gas emissions saving characteristics and sizes of the consignments referred to in point 1.1 to remain assigned to the mixture	REDII Article 30(1)(c)
	1.3 Provides for the sum of all consignments withdrawn from the mixture to be described as having the same sustainability characteristics, in the same quantities, as the sum of all consignments added to the mixture and requires that this balance be achieved over an appropriate period of time	REDII Article 30(1)(d) Refer also to the mass balance examples included in ISO 22095
	1.4 Within a site, materials shall only be considered to be part of a mixture if they are physically mixed, physically identical or belong to the same product group. ‘Product group’ means materials with similar physical or chemical characteristics, heating values and/or conversion factors.	IR 2022/996 Article 19(2)(c) adapted Definition of product group from ISCC EU Chain of Custody standard – pre-IR 2022/996 version ²⁴ (There is a more elaborate, REDII-specific definition in IR 2022/996 Article 2(21))

Note that in the UK, Ofgem (the UK biomass heat and electricity regulator) requires a mass balance system to be used for biomass heat and power, but they do not set strict requirements for the mass balance system with the aim of allowing the sector to use the mass balance system that is common practice. In the Ofgem scheme assessment, they provide a description of the mass balance chain of custody system(s) used by the schemes, for transparency, but it does not impact the judgement on the scheme or the ability to use the scheme to demonstrate compliance.

For the **chemicals sector**, the voluntary schemes **assessed all offer REDII-compliant mass balance systems, but two of the key voluntary schemes also offer non-REDII compliant mass balance options**. The key issue is options that offer more flexibility in how sustainability characteristics are allocated, which is in contradiction to the direction of travel under the REDII. For the **construction sector**, the two major global voluntary schemes also use mass balance systems that are different to the REDII mass balance system. **They are considered to be robust, but with different flexibility options than permitted under the REDII.**

²⁴ ISCC EU 203 Traceability and Chain of Custody standard (version used before implementation of IR 2022/996): https://www.iscc-system.org/wp-content/uploads/2022/05/ISCC_EU_203_Traceability_and_Chain-of-Custody-v4.0.pdf

Whilst the **bio-based chemicals industry** is relatively nascent and therefore potentially be more likely to adapt to government requirements, the main push should be to encourage the chemicals industry to develop a greater bio-based content and the requirements in IR 2022/996 especially may be too detailed and cumbersome to facilitate that development. For the **construction sector**, the use of bio-based materials – especially wood – is very well established and the main certification schemes used have been in operation globally for many years. **It is considered very unlikely that the construction sector would be willing to adapt the way their global supply chain operators are working for one national market.**

Therefore, for the mass balance systems reviewed in this report, the main inconsistencies with the REDII identified were whether to allow credit transfer at the end of a mass balance period and whether to allow the mass balance to be maintained across sites within a company (multi-site mass balance). **This proposed more high level definition of mass balance would allow those systems to be used.**

A key issue stated by the chemicals sector is that they would like **free allocation**. This mainly concerns the bio- versus fossil-share of the material, which is addressed (for the energy sector) through the EC delegated regulation on co-processing. This will be implemented into interested EC-recognised voluntary schemes by January 2024. For consistency, we recommend that it is also implemented by sectors other than fuel who are using shared facilities with the fuels industry. **Within the bio-based share**, we recommend that the NL government allows free allocation of sustainability characteristics, as long as there remain no targets to incentivise or restrict particular feedstock types in the chemicals sector.

Ultimately, the different variations of a mass balance system **can all be considered robust**, but they offer different levels of flexibility for companies. **In general, the more flexibility offered, the weaker the link between the claim and the physical material.** If taken too far, there is a risk that this leads to a perception of greenwashing without very careful attention to communication and the precise nature of claims made.

- If the chemicals sector want to make a claim about the percentage of the product that is bio-based, then it may be important for the claims to match with what the physical material is. Controlled blending allows for this but full free allocation (for bio and fossil content) would not and is not in line with the Commission's delegated regulation on co-processing.
- If the construction sector are required to claim that 100% of the material meets the NL sustainability framework, then those economic operators using a percentage claim method need to ensure they are making a 100% claim.

4. Assurance

This chapter focuses on the requirements for auditing the sustainability criteria and the governance of voluntary schemes, collectively termed “assurance”. The aim of this chapter is to review to what extent the REDII assurance requirements can be directly applied also for the additional non-energy sectors in the Dutch sustainability framework to use, or whether a more flexible approach should be implemented. The Dutch requirements should be robust, make best use of existing EC-recognised voluntary schemes and should not contradict the REDII requirements.

4.1 Introduction to assurance

Assurance is a critical component of a credible, robust and well-functioning certification system. Without it, there is a risk that compliance with the sustainability criteria by economic operators cannot be properly assessed and guaranteed.

The key questions here are to what extent the additional sectors could work with the REDII assurance requirements, and what minimum requirements the Dutch Sustainability Framework should set for assurance?

Key roles in the assurance process

The figure below sets out the key roles involved in an assurance process. In the case of the Dutch sustainability framework, the sustainability criteria – including the requirements for chain of custody and assurance – are set by the Dutch government. The Dutch government will recognise voluntary schemes who are judged to adequately cover the criteria. Those voluntary schemes then appoint independent certification bodies who employ the auditors who are qualified to check the compliance of companies with the criteria. In this way, several layers of oversight and independence are built into the system to ensure that auditors give an independent and robust check of compliance with the criteria.

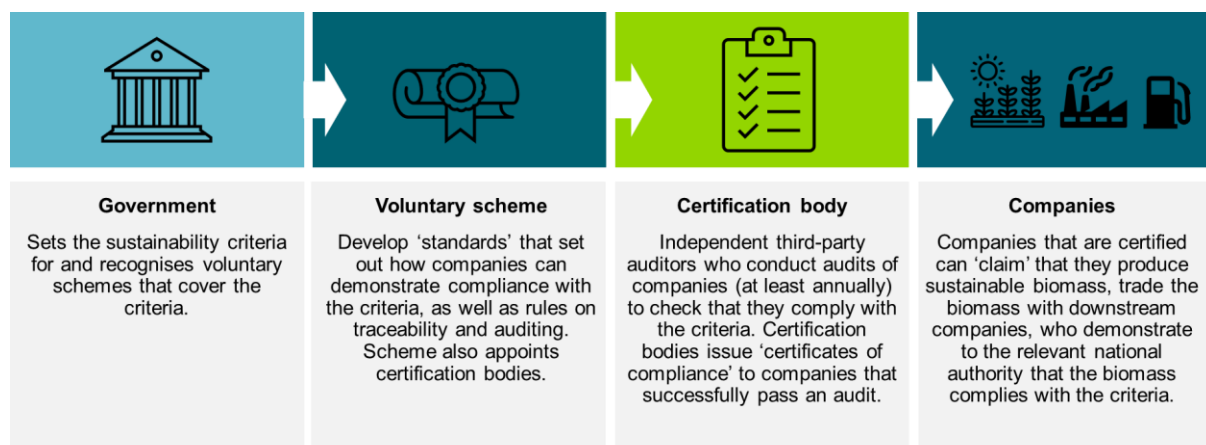


Figure 1. Key roles in an assurance process

In addition to the roles above, in a typical assurance process, certification bodies are accredited by an accreditation body. Accreditation bodies assess the performance of a certification body against ISO standards, to ensure the ongoing quality of the assurance process. The International Accreditation Forum (IAF)²⁵ is a worldwide association of national

²⁵ <https://iaf.nu/en/home/>

accreditation bodies in almost 100 countries – RvA is the national accreditation body of the Netherlands.

What are the REDII assurance requirements?

The REDII assurance requirements are set out in several clauses of **Article 30**²⁶ of the Directive, specifically clauses 3, 7, 9 and 10 (see Box 2). Of these, **clause 3** is the most detailed in scope, and aims to ensure that the information provided by economic operators for demonstrating compliance with GHG emission savings thresholds and sustainability criteria is *reliable*. The clause covers several aspects, including that economic operators arrange for an *adequate standard of independent auditing of the information submitted*, and that auditors are required to verify that the systems used by economic operators are *accurate, reliable and protected against fraud*. **Clause 7** sets out the requirements for the recognition of voluntary schemes by the European Commission on the basis that they meet *adequate standards of reliability, transparency and independent auditing*. Clauses 3 and 7 also specifically address the *intentional modification of a material to qualify as a waste or residue*, or to count as an advanced biofuel feedstock under *Annex IX*. Finally, **clauses 9 and 10** cover the *supervision of certification bodies and economic operators* by the European Commission and Member States.

Box 2: REDII requirements on assurance

REDII Article 30(3)

“Member States shall take measures to ensure that economic operators submit reliable information regarding the compliance with the GHG emission savings thresholds [...], and with the sustainability and GHG emissions saving criteria [...], and that economic operators make available to the Member State, on request, the data that were used to develop the information. Member States shall require economic operators to arrange for an adequate standard of independent auditing of the information submitted, and to provide evidence that this has been done. [...] The auditing shall verify that the systems used by economic operators are accurate, reliable and protected against fraud, including verification ensuring that materials are not intentionally modified or discarded so that the consignment or part thereof could become a waste or residue. It shall evaluate the frequency and methodology of sampling and the robustness of the data. [...]”

REDII Article 30(7)

“The Commission shall adopt decisions [...] only if the scheme in question meets adequate standards of reliability, transparency and independent auditing and provides adequate assurances that no materials have been intentionally modified or discarded so that the consignment or part thereof would fall under Annex IX.

The voluntary schemes [...] shall, at least annually, publish a list of their certification bodies used for independent auditing, indicating for each certification body by which entity or national public authority it was recognised and which entity or national public authority is monitoring it.”

REDII Article 30(9)

“Where an economic operator provides evidence or data obtained in accordance with a scheme that has been the subject of a decision pursuant to paragraph 4 or 6 of this Article, to the extent covered by that decision, a Member State shall not require the supplier to provide further evidence of compliance with the sustainability and greenhouse gas emissions saving criteria laid down in Article 29(2) to (7) and (10).

Competent authorities of the Member States shall supervise the operation of certification bodies that are conducting independent auditing under a voluntary scheme. Certification bodies shall submit, upon the request of competent authorities, all relevant information necessary to supervise the operation, including the exact date, time and location of audits. Where Member States find issues of non-conformity, they shall inform the voluntary scheme without delay.”

²⁶ Article 30 - Verification of compliance with the sustainability and GHG saving criteria.

REDII Article 30(10)

“At the request of a Member State, which may be based on the request of an economic operator, the Commission shall, on the basis of all available evidence, examine whether the sustainability and greenhouse gas emissions saving criteria laid down in Article 29(2) to (7) and (10) in relation to a source of biofuels, bioliquids and biomass fuels, and the greenhouse gas emissions savings thresholds set in, and adopted pursuant to, Article 25(2), have been met.”

The accompanying IR 2022/996 on voluntary scheme certification²⁷ sets out in further detail the assurance requirements for biomass used in the energy and transport sectors. **Chapter II** includes general rules on voluntary scheme governance, internal monitoring, complaints procedures and transparency. **Chapter III** sets out requirements for the third-party audit process, audit scope, qualification of auditors and audit supervision (see Box 3).

These requirements have been integrated into the Assessment Protocol²⁸ used to assess voluntary schemes that seek recognition by the European Commission under the REDII, and EC-recognised voluntary schemes are in the process of updating their standards to include these new requirements. To remain recognised, schemes need to meet **all** of the requirements within these articles, to the extent that they are relevant to the scope of their scheme. For example, schemes that certify forest biomass would not be required to implement the requirements on auditing of highly-biodiverse grassland (Article 16). Similarly, Article 12 (group auditing), Article 13 (auditing of wastes and residues) and Article 14 (auditing of actual GHG emission calculation) may not be relevant for some voluntary schemes and in that case do not need to be included.

Box 3: IR 2022/996 requirements on assurance²⁹
CHAPTER II GENERAL RULES ON GOVERNANCE, INTERNAL MONITORING, COMPLAINTS PROCEDURES AND TRANSPARENCY OF VOLUNTARY SCHEME

Article 3. Governance structure of the voluntary scheme

Article 4. Non-conformities of economic operators under the scheme

Article 5. Internal monitoring, complaints procedure and documentation management system

Article 6. Publication of information by voluntary scheme

Article 7. Change of scheme by economic operator

Article 8. Recognition of other voluntary schemes

Article 9. Recognition of national schemes

CHAPTER III AUDIT PROCESS, AUDIT SCOPE, QUALIFICATIONS OF AUDITORS AND AUDIT SUPERVISION

²⁷ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02018R2067-20210101&qid=1694433228108>

²⁸ https://energy.ec.europa.eu/system/files/2022-04/Assessment%20Protocol%20template_REDII_Final%20version%20April%202022_v3.pdf

²⁹ Note that the articles included in CHAPTER IV (Articles 18-23) and CHAPTER V (Articles 24-27) have not been included in Box 2 as these relate to technical requirements that are implemented by economic operators.

Article 10. Audit process and levels of assurance

Article 11. Auditor competence

Article 12. Group auditing

Article 13. Auditing of waste and residues

Article 14. Auditing of actual GHG emission calculation

Article 15. Audits of mass balance systems

Article 16. Auditing of natural and non-natural highly-biodiverse grassland

Article 17. Supervision by the Member States and the Commission

What are other internationally accepted assurance requirements?

Certification bodies follow relevant ISO standards, including ISO 19011³⁰, 17065^{31,32}, 17029³³ and 14065³⁴, to underpin a credible assurance process. These ISO standards are fundamental to the operation of the assurance process under voluntary schemes. These international standards that certification bodies adhere to are relied upon in the context of the REDII and the CORSIA Eligibility Framework and Requirements for Sustainability Certification Schemes³⁵.

ISO 19011 provides guidance on **auditing management systems**, including the principles of auditing, managing an audit programme and conducting management system audits, as well as guidance on evaluation of the competence of individuals involved in the audit process. This includes the individual(s) managing the audit programme, auditors and audit teams. It is applicable to all organisations that need to plan and conduct internal or external audits of management systems or manage an audit programme.

ISO 17065 specifies requirements for certification bodies **certifying products, processes and services**. The standard aims to ensure that certification bodies operate certification schemes in a *competent, consistent and impartial manner*. The standard covers *general* requirements (including management of impartiality and confidentiality) *structural* requirements (including safeguarding impartiality), *resource* requirements (for the certification body and audits), *process* requirements (which set out the detailed functional requirements for the operation of the audit) and *management system* requirements

³⁰ ISO 19011:2018 Guidelines for auditing management systems. Available at: <https://www.iso.org/standard/70017.html>

³¹ ISO 17065:2012 Conformity assessment - Requirements for bodies certifying products, processes and services. Available at: <https://www.iso.org/standard/46568.html>

³² ISO 17065 replaces ISO Guide 65: 1996 'General requirements for bodies operating product certification systems' (for certification bodies).

³³ ISO/IEC 17029:2019 Conformity assessment - General principles and requirements for validation and verification bodies. Available at: <https://www.iso.org/standard/29352.html>

³⁴ ISO 14065:2020 General principles and requirements for bodies validating and verifying environmental information. Available at: <https://www.iso.org/standard/74257.html>

³⁵ https://www.icao.int/environmental-protection/CORSIA/Documents/CORSIA_Eligible_Fuels/ICAO%20document%2003%20-%20Eligibility%20Framework%20and%20Requirements%20for%20SCSs%20-%20June%202022.pdf

(including documentation management and internal audit). The ISO 17065 standard is widely used by voluntary schemes globally.

ISO 17029 provides general principles and requirements for the competence, consistent operation and impartiality of bodies performing validation/verification as conformity assessment activities. Bodies operating according to this document can provide validation/verification as a first-party, second-party or third-party activity. Bodies can be validation bodies only, verification bodies only, or provide both activities. This ISO standard is relevant in the context of biomass verification under the SDE++ and EU ETS in the Netherlands³⁶.

ISO 14065 provides general principles and requirements for bodies validating and verifying environmental information. This standard specifically covers requirements for checking greenhouse gas calculations, although it is not specific to the REDII greenhouse gas calculation methodology.

ISEAL, furthermore, sets out voluntary best practice guidance for assurance through its Codes of Good Practice³⁷. Following ISEAL guidance is not mandatory for EC-recognised voluntary schemes, but four of the recognised schemes are ISEAL Members (Bonsucro, RSB, RTRS and SBP), as is the FSC scheme. Key ISEAL guidance includes:

- The ISEAL Standard-setting Code defines how a standard should be developed, structured and improved over time. The Code addresses multi-stakeholder consultation and decision-making, and ensures the standard contains clear requirements that can be measured and assessed.
- The ISEAL Assurance Code provides a framework for assessing compliance with standards, so that consumers, supply chain partners, investors and other stakeholders know they can trust the results of assessments. It encourages assurance that is rigorous and accessible, providing accurate and transparent results.
- The ISEAL Impacts Code supports monitoring and evaluation that helps systems to understand how effective their standards are in achieving what they set out to do. It provides standards with a roadmap to measure progress against sustainability goals and to improve practices over time.

³⁶ <https://www.rvo.nl/files/file/2023-07/Verification-protocol-for-sustainable-biomass-REDII-2023-eng.pdf>

³⁷ <https://www.isealliance.org/defining-credible-practice/iseal-codes-good-practice>

4.2 Analysis of assurance options for the Dutch sustainability framework

This section provides an overview of key requirements for a robust assurance system, with reference to the REDII and other relevant regulatory frameworks, as well as international ISO assurance requirements and ISEAL best practice procedures. A discussion of the extent to which the additional sectors could work with those key requirements is also provided.

What are the key assurance requirements and which ones are covered by REDII or ISO standards?

Table 11 gives an overview of key assurance requirements with references to where these are covered in the following standards or regulations:

- The REDII and IR 2022/996 requirements for the European Commission to recognise voluntary schemes used to demonstrate sustainability of bioenergy in the EU.
- The SDE++ which sets requirements for the Dutch government to recognise voluntary schemes that can be used to demonstrate compliance with the sustainability criteria for solid biomass used for heat and power in the Netherlands.
- The UK Renewable Transport Obligation originally set out a norm for audit quality which was used for the UK government to recognise voluntary schemes that could be used to demonstrate sustainability of biofuels in the UK, before the RED was introduced. An updated version of this is still used by Ofgem to recognise voluntary schemes for solid biomass for heat and power in the UK.
- ISO standards 17065 and 19011 which are followed by certification bodies worldwide for a range of sectors.
- Voluntary ISEAL codes of good practice, which are followed by many voluntary schemes and sustainability standards across a wide range of sectors.

Six requirements are included for the *governance structure of the scheme* and four requirements for *audit quality*. A proposed definition for each requirement is also provided. The requirements are largely modelled on the REDII/IR 2022/996, with additional consideration of the above national and international-level frameworks. The selection reflects our views on aspects that are considered fundamental to developing a robust assurance system.

Governance structure of scheme

- **Governance structure and scheme operation:** Schemes shall establish a governance structure to ensure that the scheme has the necessary legal and technical capacity, impartiality and independence to perform its duties. [IR Article 3(1)]
- **Stakeholder consultation:** Schemes shall include to the extent possible in the governance structure and decision-making a broad range of representatives from various relevant stakeholder groups. [IR Article 3(2)]
- **Internal monitoring:** Schemes shall set up a system of internal monitoring to verify compliance of economic operators with the rules and procedures applied by the

scheme and to ensure the quality of the work carried out by the auditors of the certification bodies. [IR Article 5(1)]

- **Complaints management:** Schemes shall establish an accessible procedure for handling complaints against economic operators and certification bodies. The assessment of complaints must be handled by individuals who are independent and ensure the protection of the complainant who reported the complaint. [IR Article 5(3)]
- **Documentation management system:** Schemes, certification bodies and economic operators shall establish a documentation management system. Documentation should be kept for a minimum of five years.
 - The documentation management system for voluntary schemes certification bodies must cover aspects such as general management of the documentation, control of documents and records, management review of the system, internal auditing/internal monitoring, as well procedures for identification and management of non-conformities and procedures for taking preventive actions to eliminate the causes of potential non-conformities.
 - Economic operators must have an auditable system for safekeeping and reviewing all evidence related to the claims they make, or rely on, and accept responsibility for preparing any information related to the auditing of such evidence. [IR Article 5(5), Article 10(5)]
- **Transparency of scheme operation:** Schemes shall make information regarding the operation of the scheme publicly available on a website. This should³⁸ include scheme contact details, information on the governance structure of the scheme, the latest version of their scheme documentation, a list of economic operators participating in the scheme along with their certification status and a list of certification bodies carrying out audits under the scheme. [IR Article 6]

Audit quality

- **Audit frequency:** Schemes shall require that economic operators successfully pass an initial audit before allowing them to participate in the scheme. A re-certification audit shall take place at least every 5 years evaluating all scheme requirements. Surveillance audits to monitor the certificate holder's continued compliance shall be undertaken at least annually in the intervening years. [IR Article 10(1-2), RTFO norm criterion 3]
- **Management of audit:** Schemes shall have clear procedures that describe how audits are planned, conducted and reported on. The procedures shall also include a classification of non-conformities with the scheme's criteria and requirements to ensure timely enforcement of corrective measures, including suspensions, where appropriate. [IR Articles 4, 10(2-4)]
- **Auditor competency (including impartiality):** The audit team shall have the competence, experience and the generic and specific skills necessary for conducting the audit taking into account the scope of the audit. Auditors shall be independent of the activity being audited and free from conflict of interest and be required to undergo

³⁸ Note that the IR requires all of these aspects to be published, but we have proposed some flexibility here.

regular training covering all aspects relevant to the scope of the scheme. [IR Article 11]

- **Accreditation of certification bodies:** Certification bodies performing audits under a scheme shall be accredited to ISO 17065, and to ISO 14065 where it performs audits on actual GHG values. [IR Article 11(1)]

Table 8. Overview of key assurance requirements set out in selected regulatory frameworks and international standards

Requirement	REDII (IR 2022/996)	SDE++ ³⁹	UK RTFO ⁴⁰	ISO 17065 and 19011	ISEAL Codes of Good Practice
Governance of the scheme					
Governance structure and scheme operation	IR Article 3	Criterion 2, 3, 4, 5, 6	-	ISO 17065 - Clause 5	Standard Setting - Clause 5 Assurance - Clause 5.1 Impacts - Clauses 5
Stakeholder consultation	IR Article 3	Criterion 2	Criterion 5	-	Standard Setting - Clauses 5.2, 5.4, 5.8, 6.4 Assurance - Clause 6.3.2 Impacts - Clauses 6
Internal monitoring	IR Article 5	-	-	ISO 17065 - Clauses 6.1.2.2, 6.2.2.4	Impacts - Clauses 5-8 Assurance - Clause 4.5
Complaints management	IR Article 5	Criterion 7	-	ISO 17065 - Clause 7.13	Standard Setting - Clause 5.11 Assurance - Clause 5.1.12
Documentation management	IR Article 5, 10 ⁴¹	Criterion 8 ⁴²	Criterion 8	ISO 17065 Clauses 7.13, 8 ⁴²	Assurance - Clause 5.11 ⁴²

³⁹ Dutch requirements for assurance for solid biomass used under the SDE+ (Appendix A of this report).

⁴⁰ RTFO Norm for audit quality (Appendix B). Note that the updated version used by Ofgem to recognise voluntary schemes for solid biomass for heat and power in the UK also include requirements on complaints management and group auditing.

⁴¹ Article 5 covers voluntary schemes and certification bodies, while Article 10 covers economic operators.

⁴² Specifically for certification bodies.

Requirement	REDII (IR 2022/996)	SDE++ ³⁹	UK RTFO ⁴⁰	ISO 17065 and 19011	ISEAL Codes of Good Practice
Transparency of scheme operation	IR Article 6	Criterion 5	Criterion 6	ISO 17065 Clause 4.6	Standard Setting – Clauses 5.3, 5.7 Assurance - Clause 6.3.1
Audit quality					
Audit frequency	IR Article 10	-	Criterion 3	ISO 17065 Clause 7.9	-
Management of the audit	IR Articles 4, 10	-	Criterion 2	ISO 17065 Clause 7 ISO 19011 Clauses 5, 6	Assurance - Clauses 5.1, 5.2
Auditor competency (including impartiality)	IR Article 11	-	Criterion 1, 4	ISO 17065 Clauses 4.2, 5.2, 6 ISO 19011 Clause 7	Assurance - Clause 5.5, 5.6
Accreditation of certification bodies	IR Article 11	(Criterion 6)	Criterion 7	N/A	Assurance - Clause 5.4 ⁴³

As can be seen in Table 8, all of the key assurance requirements are included in the REDII. **The SDE++ focusses mostly on aspects that relate to the governance of the scheme. In contrast, the UK RTFO has less coverage of governance related aspects, but comprehensively covers audit quality.** The ISO standards (17065 and 19011) and ISEAL Codes of Good Practice provide very good coverage of all assurance requirements, with a limited number of aspects not covered. These ISO standards do not cover stakeholder consultation or the accreditation of certification bodies, however, ISO 17011⁴⁴ does cover accreditation of certification bodies.

Coverage of key requirements by voluntary schemes

Table 9 shows a high level benchmark of selected voluntary schemes (ISCC Plus, REDCert2, RSB Global, FSC, PEFC) against the key assurance requirements. The schemes have very high coverage of the key assurance requirements. The biobased schemes (ISCC Plus, REDCert2 and RSB) have broadly consistent audit requirements for energy and non-energy use. Furthermore, all EC-recognised voluntary schemes will cover these requirements, once the implementation of IR 2022/996 into the schemes is completed (due end of 2023). The forest biomass schemes (FSC and PEFC) are both international non-profit, non-governmental organisations with extensive stakeholder involvement and robust

⁴³ Note that this is referred to as 'Oversight' by ISEAL.

⁴⁴ ISO/IEC 17011:2017. Conformity assessment — Requirements for accreditation bodies accrediting conformity assessment bodies. Available at: <https://www.iso.org/standard/67198.html>

governance structures. Furthermore, as discussed, FSC is an ISEAL member and implements the codes of good practice. It follows, that these schemes therefore also provide a high assurance standard.

The schemes, in principle, cover all of the assurance requirements. **Accreditation** is a potential issue for all schemes though, depending on the scope of the accreditation requirements. Under the REDII, accreditation requirements for certification bodies follow a two-stage process. Firstly, it is expected that certification bodies are accredited to ISO 17065 and 14065⁴⁵, **and secondly it is expected that the certification bodies are accredited** by a national accreditation body and in accordance with Regulation (EC) No 765/2008^{46,47}, or otherwise recognised by a competent authority, to the scope of Directive (EU) 2018/2001 or the specific scope of the voluntary scheme. Although all schemes cover the first requirement (ISO 17065 and 14065), only Better Biomass is additionally accredited to the scope of the REDII at this time. Member States may otherwise allow voluntary schemes to use a system of independent oversight, although no such approaches have been approved⁴⁸. In this light, the implementation of this requirement under the REDII has been very challenging for the bioenergy voluntary schemes to implement to date. Acknowledging this, the European Commission is due to issue a clarification note to the voluntary schemes by the end of 2023 setting out a way forward (not yet issued at the time of writing).

Table 9. High level benchmark of selected voluntary schemes against key assurance requirements

Requirement	ISCC Plus	REDcert2	RSB Global	FSC	PEFC
Governance of the scheme					
Governance structure and scheme operation	x	x	x	x	x
Stakeholder consultation	x	x	x	x	x
Internal monitoring	x	x	x	x	x
Complaints	x	x	x	x	x
Documentation management	x	x	x	x	x
Transparency	x	x	x	x	x

⁴⁵ For example, by an accreditation body that is a member of the International Accreditation Forum (IAF). See <https://iaf.nu/en/accreditation-bodies/>

⁴⁶ REGULATION (EC) No 765/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products and repealing Regulation (EEC) No 339/93. Available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:218:0030:0047:en:PDF>

⁴⁷ This effectively restricts the accreditation to the national accreditation bodies of EU Member States.

⁴⁸ Note that FSC uses the Assurance Services International (ASI) as its oversight (assurance) provide.

Requirement	ISCC Plus	REDcert2	RSB Global	FSC	PEFC
Audit quality					
Audit frequency	x	x	x	x	x
Management of the audit	x	x	x	x	x
Auditor competency (including impartiality)	x	x	x	x	x
Accreditation of certification bodies	(x)	(x)	(x)	(x ⁴⁹)	(x)

⁴⁹ Note that FSC uses Assurance Services International (ASI) as its assurance provider.

4.3 Advice to RVO

Based on the analysis undertaken, we recommend implementing the proposed assurance requirements, as described and set out in Table 10 below. The requirements focus on the key aspects that are important to ensure a robust system of assurance system, covering both the set-up and functioning of the scheme and the operation of the audit system.

Table 10. Proposed criteria and indicators for assurance

Criterion	Indicator	Reference
Governance structure of scheme		
1. Governance structure and scheme operation	Schemes shall establish a governance structure to ensure that the scheme has the necessary legal and technical capacity, impartiality and independence to perform its duties.	IR Article 3(1)
2. Stakeholder consultation	Schemes shall include to the extent possible in the governance structure and decision-making a broad range of representatives from various relevant stakeholder groups.	IR Article 3(2)
3. Internal monitoring	Schemes shall set up a system of internal monitoring to verify compliance of economic operators with the rules and procedures applied by the scheme and to ensure the quality of the work carried out by the auditors of the certification bodies	IR Article 5(1)
4. Complaints management	Schemes shall establish an accessible procedure for handling complaints against economic operators and certification bodies. The assessment of complaints must be handled by individuals who are independent and ensure the protection of the complainant who reported the complaint.	IR Article 5(3)
5. Documentation management system:	<p>Schemes, certification bodies and economic operators shall establish a documentation management system. Documentation should be kept for a minimum of five years.</p> <ul style="list-style-type: none"> The documentation management system for voluntary schemes certification bodies shall cover aspects such as general management of the documentation, control of documents and records, management review of the system, internal auditing/internal monitoring, as well procedures for identification and management of non-conformities and procedures for taking preventive actions to eliminate the causes of potential non-conformities. Economic operators must have an auditable system for safekeeping and reviewing all evidence related to the claims they make, or rely on, and accept responsibility for preparing any information related to the auditing of such evidence. 	IR Article 5(5), 10(5)

6. Transparency of scheme operation	Schemes shall make information regarding the operation of the scheme publicly available on a website. This should include scheme contact details, information on the governance structure of the scheme, the latest version of their scheme documentation, a list of economic operators participating in the scheme along with their certification status and a list of certification bodies carrying out audits under the scheme	IR Article 6
Audit quality		
7. Audit frequency	Schemes shall require that economic operators successfully pass an initial audit before allowing them to participate in the scheme. A re-certification audit shall take place at least every 5 years evaluating all scheme requirements. Surveillance audits to monitor the certificate holder's continued compliance shall be undertaken at least annually in the intervening years	IR Article 10(1-2), RTFO criterion 3
8. Management of audit	Schemes shall have clear procedures that describe how audits are planned, conducted and reported on. The procedures shall also include a classification of identified non-conformities with the scheme's criteria and requirements to ensure timely enforcement of corrective measures, including suspensions, where appropriate.	IR Articles 4, 10(2-4)
9. Auditor competency (including impartiality)	The audit team shall have the competence, experience and the generic and specific skills necessary for conducting the audit taking into account the scope of the audit. Individual auditors shall be independent of the activity being audited and free from conflict of interest.	IR Article 11
10. Accreditation of certification bodies	Certification bodies performing audits under a scheme shall be accredited to ISO 17065, and to ISO 14065 where it performs audits on actual GHG values.	IR Article 11(1)

We do not foresee specific issues in the implementation of these requirements for schemes operating in these sectors, or any specific issues for the auditing of agricultural or forest biomass. For example, both FSC and PEFC have already applied these requirements for many years. Furthermore, the assurance requirements for the biobased schemes (ISCC PLUS, REDcert2 and RSB Global) are fundamentally the same as their EU equivalents, and so the scheme owners are already familiar with the requirements. However, one aspect which may be a challenge is the extent to which sufficient trained auditors will be available for the biobased sector, given that this market is still developing. We recommend that this is a focus area for Dutch policy makers.

RVO may reflect on the extent to which the specific wording of the requirements is fully aligned with the IR 2022/996. Specifically, for transparency of the scheme operation (#7) we proposed some flexibility in the requirement wording for the information that needs to be made available (i.e. use of "should" vs "shall"). It should also be noted that we have applied selected text from the relevant IR articles, rather than the full article. We have focused on including the most relevant aspects and have avoided the inclusion of very detailed requirements to facilitate their practical implementation. However, RVO may wish to complement the above proposed requirements with additional aspects from the IR articles.

As an additional requirement, we recommend that the RVO establishes a process of **supervision of the certification bodies and economic operators** for voluntary schemes active under the new Dutch Sustainability Framework. This can be based on the main provision of Article 17 of IR 2022/996, for example, granting access to the premises of economic operation and the provision of relevant information (e.g. audit reports and actual

value GHG calculations). It is recommended that compliance with the supervision requirements is included as a pre-condition for recognition of voluntary schemes under the Dutch Sustainability framework.

Finally, the requirement for accreditation needs careful consideration and should reflect on the outcomes of the ongoing discussions between the European Commission and the bioenergy voluntary schemes in the context of the REDII. However, as a minimum we would recommend that accreditation is undertaken by a member of the International Accreditation Forum (IAF) as a starting point, with the longer term aim of requiring accreditation to the scope of the voluntary scheme.

Appendix A. NL top sustainability criteria (translation)

The following table includes an English translation of the NL top sustainability criteria. The official criteria are published in Dutch language in the [letter to parliament](#).

Table 11. NL Top principles and criteria in scope

Principle	Criteria (full, translated)
Principle 2: Water availability	2.1 Forest Biomass: The water balance of both groundwater and surface water in the production unit, as well as downstream outside the production unit, is at least maintained and improved where necessary.
	2.2 Agricultural biomass: Surface and groundwater use in agricultural land is less than the natural restoration of the (ground) water system
	2.3 Agricultural biomass: Negative effects on water availability on other users and ecosystems are prevented or minimized.
Principle 4: Quality of ground and surface water	4.1 Agricultural and forest biomass: Negative impacts of cultivation of agricultural or forest biomass, regarding water quality for other users and ecosystems, are prevented or minimized
Principle 5: Good agricultural practice and forest management	5.1 Forest biomass: The use of chemicals is only allowed if maximum use of ecological processes and sustainable alternatives prove to be insufficient. The use of pesticides classified by the World Health Organization as type 1A and 1B and chlorinated hydrocarbons is not permitted.
	5.2 Agricultural biomass: The use of chemical agents shall be minimized wherever possible by applying integrated pest management (IPM) and other sustainable agricultural practices.
	5.3 Agricultural biomass: Only registered plant protection products are used. The application of agricultural chemicals is documented and all operations, storage, collection and disposal of chemical waste and empty containers are monitored to ensure compliance with good practices. Chemicals are stored and disposed of safely.
	5.4 Agricultural biomass: The use of pesticides listed in the Rotterdam Convention and in the Stockholm Convention on Persistent Organic Pollutants (POPs) is not allowed.
	5.5 Agricultural biomass: The use of pesticides classified by the World Health Organization as type 1A and 1B and chlorinated hydrocarbons is not allowed.
	5.6 Agricultural biomass: The producer applies good agricultural practices on his land: -Soil quality is maintained and where possible improved through good nutrient balance. -Erosion is prevented, through good agricultural practices. -(Bio)diversity on the land: crop rotation and natural vegetation around springs and along natural watercourses is maintained and, where possible, restored.
Principle 6: Responsible waste management	6.1 Agricultural and forest biomass: The generation of inorganic waste and litter shall be prevented or collected, stored at the specified location(s) and disposed of in an environmentally responsible manner.
	6.2 Agricultural biomass: Agricultural waste shall be reduced, reused and/or recycled. The use of agricultural residues shall not compromise the function of local use of by-products, soil organic matter or soil nutrient balance.

Appendix B. International sustainability frameworks

B.1 International sustainability frameworks

There are several international sustainability frameworks, both general frameworks and several specifically for bioenergy. The most well known international sustainability framework are the Sustainable Development Goals (SDG's) by the United Nations. Specifically for bioenergy, ISO developed standard 13065 for sustainable bioenergy, and G8 +5 nations developed the Global Bioenergy Partnership⁵⁰ (GBEP) in 2005 to promote sustainable bioenergy especially in developing countries where biomass use is high. The following sections describe how these systems cover the topics addressed by the NL top criteria.

B.2 Principles 2 & 4: Water availability and Quality of ground and surface water

Water management is covered by SDG 6: Ensure availability and sustainable management of water and sanitation for all.⁵¹

Water quantity and quality is also covered by ISO 13065:2015 criterion 5.2.2.1 and 5.2.2.1.1 water quantity and quality⁵²

- Indicator 5.2.2.1: The economic operator provides information on how water quantity and quality resulting from water withdrawals and releases are addressed.
- Indicator 5.2.2.1.1: Describe procedures applied to identify potential impacts on water quantity including consideration of water depletion and other key chemical, physical and/or biological parameters. Describe procedures applied to identify potential impacts on water quality, including consideration of eutrophication and oxygen depletion and other key chemical, physical and/or biological parameters. The impacts to water quantity and quality shall be addressed with respect to water sources and **receiving bodies**.

The Global Bioenergy Partnership (GBEP) covers most of principle 2 and 4 with the GBEP indicator 5 'Water use and efficiency' and indicator 6 'Water Quality'. More specifically, it looks at⁵³:

- Indicator 5.1: Water withdrawn from nationally determined watershed(s) for the production and processing of bioenergy feedstocks, expressed.
- Indicator 5.1a: as the percentage of total actual renewable water resources (TARWR) and
- Indicator 5.1b: as the percentage of total annual water withdrawals (TAWW), disaggregated into renewable and non-renewable water sources.
- Indicator 5.2: Volume of water withdrawn from nationally determined watershed(s) used for the production and processing of bioenergy feedstocks per unit of bioenergy output, disaggregated into renewable and non-renewable water sources.

⁵⁰ <https://www.globalbioenergy.org/>

⁵¹ United Nations, (n.d.), [THE 17 GOALS | Sustainable Development \(un.org\)](https://www.un.org/sustainabledevelopment/)

⁵² The International Organization for Standardization, 2015, [ISO 13065:2015 Sustainability criteria for bioenergy, ISO 13065:2015 - Sustainability criteria for bioenergy](https://www.iso.org/standard/68811.html)

⁵³ Global Bioenergy Partnership, 2011, [The GBEP Sustainability Indicators for Bioenergy, The GBEP Sustainability Indicators for Bioenergy FINAL.pdf \(globalbioenergy.org\)](https://www.globalbioenergy.org/GBEP_Sustainability_Indicators_for_Bioenergy_FINAL.pdf)

- Indicator 6.1: Pollutant loadings to waterways and bodies of water attributable to fertilizer and pesticide application for bioenergy feedstock production and expressed as a percentage of pollutant loadings from total agricultural production in the watershed.
- Indicator 6.2: Pollutant loadings to waterways and bodies of water attributable to bioenergy processing effluents and expressed as a percentage of pollutant loadings from total agricultural processing effluents in the watershed.

Water availability isn't addressed with a specific indicator. However, water availability is included in its list of themes that fall under its environmental pillar: 'GBEP considers the following themes relevant, and these guided the development of indicators under this pillar: Greenhouse gas emissions, Productive capacity of the land and ecosystems, Air quality, Water availability, use efficiency and quality, biological diversity, Land-use change, including indirect effects.'

B.3 Principle 5: Good agricultural practice and forest management

The SDGs, ISO 13065:2015 or GBEP do not cover principle 5 as extensively as they do for water management (see B.2).

Good agricultural practices for producers touched upon in SDG 15: life on land.

The ISO 13065:2015 covers several criteria related to good agricultural practice and forest management by providing guidance to their main indicators. For criteria 5.2, ISO uses guidance on their indicator 5.2.5.1.3: 'Describe measures taken to address biodiversity impacts [...] change pesticide and/or fertilizer regimes, e.g. intensity, integrated pest management or ecological management of pests and nutrients such as push and pull crops, intercropping, etc.' Criteria 5.3 is touched upon in the guidance of ISO indicator 5.2.4.1.2 '[...] the economic operator should provide a list of each source, rate and impact in text or tabular format as follows, for example: pesticides, manure and fertilizers (e.g. NH₃, dust) [...]'. For criteria 5.6 the ISO has the criteria 5.2.3 protect soil quality and productivity, whereby soil erosion is included in the list of indicators accompanying this criterion. The other criteria of principle 5 aren't covered by the ISO 13065:2015 standard.

The GBEP has three relevant indicators related to principle 5:

- Indicator 7: Biological diversity in the landscape, lists integrated pest management as relevant conservation method
- Indicator 2: soil quality, lists Stockholm convention POPs under relevant international processes.
- indicator 2: soil quality, and soil erosion is included in their list of 5 indicators that contribute to soil degradation.

B.4 Principle 6: Responsible waste management

The SDGs and ISO 13065:2015 do not cover responsible waste management. Only the GBEP refers to agricultural residues by stating: 'the percentage of bioenergy produced from residues (8.3b) and/or wastes (8.3c) refers to potential bioenergy feedstocks for which the impact on land use can be minimal depending on the volume and means of harvest. Agricultural residues and wastes contribute significantly to soil organic carbon and soil quality, and so this indicator should be evaluated in concert with Indicators 1 (Lifecycle GHG emissions) and 2 (Soil quality).'

B.5 European legislation

The REDII does not cover NL Top principles 2, 4 and 5 as mandatory requirements for economic operators to comply with.

REDII Article 30(4) (and the REDI before it) in theory allows the Commission to assess whether voluntary schemes “contain accurate information on measures taken for **soil, water and air protection**, for the restoration of degraded land, for **the avoidance of excessive water consumption in areas where water is scarce** [...]”, which would address key risks for those principles 2, 4 and 5. However, to date, the Commission has never done this and has not published any more detailed criteria against which they would evaluate schemes on these topics.

Regarding NL Top criterion 6.2, Article 29(2) of the REDII does aim to address the same issue related to **sustainable harvesting of agricultural residues**. Article 29(2) states: “Biofuels, bioliquids and biomass fuels produced from waste and residues derived not from forestry but from agricultural land shall be [counted towards the REDII target] only where operators or national authorities have monitoring or management plans in place in order to address the impacts on soil quality and soil carbon. Information about how those impacts are monitored and managed shall be reported pursuant to Article 30(3).”

The REDII IR 2022/996 includes additional information on voluntary scheme certification and auditing (which is relevant to the chain of custody and assurance), but it does not include further detail on the sustainability criteria.

The REDII IR 2022/2448 on forestry sustainability includes additional guidance on the REDII forestry sustainability criteria (Article 29(6)-(7)) which mentions soil and water. Article 3 requires that economic operators report to Member States to ensure:

- (iv) ‘that forest harvesting is carried out in a way that minimises negative impacts on **soil quality** and biodiversity, which may be proven by providing evidence that the applicable law, or relevant forest management rules’
- (v) ‘that the long-term production capacity of the forest is maintained or increased’. Long-term production capacity is defined as ‘the health of the forest and its ability to continuously and sustainably deliver goods, such as wood of various quality grades, and non-wood-forest products and ecosystem services, **including air and water purification**, maintenance of wildlife habitat, recreation or cultural capital, over a long period of time, and where applicable, bridging several successive forestry rotations’.

The second bullet point here touches upon NL Top criterion 4.1 - negative impacts of forestry regarding water quality for other users and ecosystems are prevented or minimized – but the REDII criteria does not robustly cover the same issue the NL Top criterion aims to address.

Member States should report on broader sustainability issues in their National Energy and Climate Progress Report to the Commission. The Governance Regulation 2018/1999 requires Member States to report on ‘where available, the estimated impact of the production or use of biofuels, bioliquids and biomass fuels on biodiversity, **water resources, water availability and quality**, soils and air quality within the Member State’. This has to be combined by the EC to a Union bioenergy sustainability report which, whilst it does not prevent risks related to these criteria, does to some extent require Member States – and the Commission to monitor these risks for bioenergy feedstocks.

B.6 Overview

As can be seen in Table 12, the criteria related to water criteria are covered by all of the international systems considered. For the specific criteria related to pesticide use, coverage is more fragmented, while all systems included the concept of applying good agricultural practices. The generation of inorganic waste is not covered by any of the systems, while only GBEP covers sustainable use of agricultural residues. Only the sustainable use of agricultural residues is covered as a mandatory sustainability requirement for bioenergy in the REDII.

Table 12: Overview of coverage of sustainability criteria by international systems

Principle	Criteria (shortened)	SDGs	ISO 13065:2015	GBEP	REDII
2: Water availability	2.1 Forest: water balance	Green			Red
	2.2 Agri: water balance	Green			Red
	2.3 Agri: water availability for others	Green			Red
4: Quality of ground and surface water	4.1 Agri and forest: water quality	Green			Yellow
5: Good agricultural practice and forest management	5.1 Forest: Limit use of chemicals. No type 1A and 1B pesticides	Red			
	5.2 Agri: Limit use of chemicals and apply IPM	Red			
	5.3 Agri: Use and safety of registered plant protection products	Green	Red		
	5.4 Agri: No banned pesticides	Red	Green	Red	Red
	5.5 Agri: No type 1A and 1B pesticides	Red			
	5.6 Agri: Good agricultural practices related to soil quality, erosion prevention and biodiversity (crop rotation and natural vegetation)	Green			Red
6: Responsible waste management	6.1 Agri and forest: inorganic waste	Red			
	6.2 Agri: reduce, reuse or recycle residues. Use of residues shall not compromise local use of by-products or soil quality	Red	Green	Yellow	Yellow

Appendix C. Analysis of the individual criteria

In this section, for each criterion, we describe the following:

- What is the criterion and the risk it intends to mitigate?
- Who is responsible for this risk?
- How is the criterion covered by voluntary schemes?
- Is the criterion described in a way that an auditor could check compliance?
- Pros and Cons of keeping this criterion.

We assessed the following voluntary schemes: ISCC Plus, REDCert2, RSB Global, FSC, PEFC and RSB Forestry. In addition we checked the coverage of the NL Top criteria in the “meta-standards”⁵⁴ by International Civil Aviation Organization’s (ICAO) sustainability criteria for sustainable aviation fuels that are eligible under the international Carbon Offsetting and Reduction Scheme for International Aviation (CORSA), and the UK’s Renewable Transport Fuel Obligation (RTFO) Meta-standard for sustainable land use which was used prior to the RED for UK biofuel. The selection of schemes and meta-standards is based on their importance for the Dutch market, coverage of agricultural and/or forest biomass, and relevance for the different sectors.

- ISCC Plus⁵⁵, REDCert2⁵⁶ and RSB Global⁵⁷ are selected as they aim to certify agricultural crops and residues and forest biomass in the context of bioeconomy, chemicals and materials. All three of these voluntary schemes also have a version that is recognized by the European Commission in the context of bioenergy sustainability in the REDII (e.g. ISCC EU and REDcert). ISCC Plus and REDCert2 both cover agricultural and forest biomass and wastes and residues.
- FSC and PEFC are long-established voluntary schemes focused on the certification of forest biomass. Currently, they are not recognised by the Commission in the context of the REDII, and therefore cannot be directly used for bioenergy in the EU.⁵⁸ However, they are significantly used to certify woody biomass (including forest biomass, waste wood and recycled wood) in the materials and construction sectors. RSB Forestry also focusses on forest biomass and is recognised by the Commission in the context of the REDII (RSB EU RED).
- The CORSA standard for eligible sustainable aviation fuels was very recently agreed following broad international stakeholder engagement through ICAO and the **RTFO Sustainable Land Use Standard**, whilst some years old now, was also developed following a broad stakeholder engagement process.

⁵⁴ A meta-standard is a sustainability framework against which certification schemes are assessed and recognised – much in the same way as is envisaged in the Dutch Sustainability Framework

⁵⁵ <https://www.iscc-system.org/certification/iscc-certification-schemes/iscc-plus/>

⁵⁶ <https://www.redcert.org/en/redcert-systems.html>

⁵⁷ <https://rsb.org/>

⁵⁸ Although PEFC has applied for recognition: https://energy.ec.europa.eu/topics/renewable-energy/bioenergy/voluntary-schemes_en

In the following sections, if a scheme or meta-standard is not included in the table, this means that the scheme does not cover a particular issue.

C.1 Principle 2: Water availability

C.1.1 Criterion 2.1 Forest biomass: The water balance of both groundwater and surface water in the production unit, as well as downstream outside the production unit, is at least maintained and improved where necessary

What is the criterion and the risk it intends to mitigate?

The criterion aims to ensure that the production of forest does not negatively impact the availability of water for the forest or for those downstream who are dependent on the same water source. This is to ensure enough water will be available for the management unit in the future, as well for those who rely on the same water source (humans, animals, plants).

The criteria mentions both groundwater and surface water. For groundwater the risk relates to not extracting more water from the ground than the ecosystem can replenish.

For surface water, it is most relevant to ensure that any wood harvesting activities do not exacerbate surface run-off and increase the flooding risk for the downstream landscape.

Water availability risk is highest in vulnerable, water scarce areas. These areas are likely to increase in the future with climate change. However, as forest production usually relies on rainfall and is not irrigated, so the risk to depletion of ground and surface water availability from forestry is considered to be low. Some species of plantation forestry, such as Eucalyptus and Pinus can have higher water use than previous indigenous forest or than previous land use, so the location of such planting should be carefully considered to avoid downstream impacts.

In the Netherlands for instance groundwater levels have reduced, although only slightly, due to increased forest density. South Africa was cited by one interviewee as an example of a region where water availability risk is relevant to a higher degree. A lot of South African forestry involves the cultivation of non-native Eucalyptus and Pinus species in places where there was no previous natural forest, which leads to additional strain on groundwater levels despite the plantations being irrigated only by natural rainwater. Plantations can have higher water consumption than (natural) forest. For FSC, economic operators always need to justify why they use exotic trees (aka non-native species) and do an environmental impact assessment, and furthermore in South Africa water consumption is managed by national law.⁵⁹ Planting exotic plantations where there was no forest before is not necessarily a typical situation, but nevertheless it highlights the importance of considering the starting situation and assessing environmental impacts before planting a new plantation. The criterion is especially relevant for vulnerable (dry) areas and with high water using species like Eucalyptus plantations, however it is worded in such a way that it must be applied everywhere. In some cases plantations use more water than natural forest even if the latter was present before. Overall, however, water availability is considered to be a relatively minor risk for forestry biomass.

Who is responsible for this risk?

The responsibility to manage this risk depends on national and regional legislation.⁵⁹ Forest owners often need to do an environmental impact assessment before starting a plantation or implementing changes. This is, for instance, a mandatory part of getting FSC certified.

⁵⁹ Interview Bernd

However, forest owners cannot always be held responsible for water quantity outside the production unit.

How is the criterion covered by voluntary schemes?

This criterion is covered in full by multiple voluntary schemes. The schemes that only partially cover water all discuss the conservation of water resources to some extent.

For forestry schemes, the criterion is covered in full by PEFC. For FSC, the core criteria does not explicitly mention downstream water outside the production unit, but FSC does require a mandatory environmental impact assessment which should cover this.⁵⁹ One could argue that this criterion is covered by the scheme, as sufficient water quantity is ensured automatically when water quantity and soil quality are up to par. Overall, this criterion is addressed in some way or form by six out of six voluntary schemes analysed, indicating auditability and relevance.

Of the assessed meta standards, CORSIA covers the criterion and the RTFO Meta-Standard covers it partially.

Voluntary scheme or meta-standard	Benchmark
ISCC Plus (Forestry)	<i>"The water balance and quality of water in the management system at the forest sourcing area level and downstream outside the unit are at least maintained and where necessary improved."</i>
REDCert2	<p data-bbox="544 1055 1401 1126">Partial: Nothing is said explicitly about the surface and groundwater levels.</p> <p data-bbox="544 1167 1401 1339"><i>"In addition to the requirements under 4.4.10, water resources must be properly protected and managed. In general, water must be protected against pollution and run-off to ensure that enough water is supplied to humans, livestock and crops (in this particular order) in line with their needs."</i></p>
RSB Global	<i>"Water used for the operations shall not be withdrawn beyond replenishment capacity of the water table, watercourse, or reservoir from which the water comes."</i>
FSC	<p data-bbox="544 1449 1401 1520">Partial: nothing is mentioned about downstream water outside production unit being maintained or protected.</p> <p data-bbox="544 1561 1401 1697"><i>"The Organization shall protect or restore natural water courses, water bodies, riparian zones and their connectivity. The Organization shall avoid negative impacts on water quality and quantity and mitigate and remedy those that occur."</i></p> <p data-bbox="544 1738 1401 2040"><i>"The Organization, through engagement with affected stakeholders, interested stakeholders and other means and sources, shall assess and record the presence and status of the following High Conservation Values in the Management Unit, proportionate to the scale, intensity and risk of impacts of management activities, and likelihood of the occurrence of the High Conservation Values: - HCV 4 - Critical ecosystem services. Basic ecosystem services* in critical situations, including protection of water</i></p>

Voluntary scheme or meta-standard	Benchmark
	<p><i>catchments and control of erosion of vulnerable soils and slopes.”</i></p> <p><i>“The Organization shall manage infrastructural development, transport activities and silviculture so that water resources and soils are protected, and disturbance of and damage to rare and threatened species, habitats, ecosystems and landscape values are prevented, mitigated and/or repaired.”</i></p>
PEFC	<p><i>“The standard requires that special care shall be given to forestry operations in forest areas with water protection functions to avoid adverse effects on the quality and quantity of water resources. [...] Downstream water balance and water quality shall not be significantly affected by the operations.”</i></p>
RSB Woody biomass	<p><i>Partial: Nothing is mentioned about managing water levels or quality outside of the production unit</i></p> <p><i>“Depletion of water resources: RSB Principle 9 on Water requires operators to maintain or enhance the quality and quantity of surface and groundwater resources. Some SRWC species draw a significant amount of water from the soil through the process of transpiration. In line with criterion 9c, the operator shall implement practices to ensure that the plantation does not contribute to the depletion of surface or groundwater resources beyond replenishment capacities.”</i></p>
CORSIA sustainability criteria	<p><i>“Criterion 4.2: Operational practices will be implemented to use water efficiently and to avoid the depletion of surface or groundwater resources beyond replenishment capacities.”</i></p>
RTFO Meta-standard	<p><i>Partial: Does not say anything about maintaining or improving water balances. National and local laws might not cover criterion (completely)</i></p> <p><i>“4.1 Compliance with national laws and regulations relevant to contamination and depletion of water sources.”</i></p>

Is the criterion described in a way that an auditor could check compliance?

Whilst it may be more challenging for an auditor to actually check groundwater impacts and also downstream impacts (as these are out of the control of the unit being audited), many voluntary schemes do include this criterion and it is common for new plantations to be required to conduct an up-front environmental impact assessment which would cover water availability.

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
<p>It makes sense to ensure a level playing field for forestry and agriculture</p>	<p>Risk is limited for forestry. The only major instance mentioned in interviews is South Africa, and here legislation and national standards have acted already.</p>

Covered by many international systems and voluntary schemes and thus relevant	Responsibility of (and ability to check) the water balance outside the influence of the operator
Covered by many voluntary schemes and thus auditable	Not aligned with the REDII and IR thus difficult for the market
Not covered by REDII	

C.1.2 Criterion 2.2 Agricultural biomass: Surface and groundwater use in agricultural land is less than the natural restoration of the (ground) water system

What is the criterion and the risk it intends to mitigate?

The criterion aims to ensure that agricultural activities do not negatively impact the availability of water. This is to ensure enough water will be available in the future for both the farmer, as well as for those who rely on the same water source, although – unlike the similar forestry criterion (2.1) – the criterion does not explicitly mention downstream. The criterion is also worded in a slightly different way to 2.1, in that it says water use should be less than the natural restoration, whereas for forestry the criterion says water availability should be “at least maintained and improved where necessary”. Note that if water use is always less than natural restoration, this could eventually lead to a situation with too much water, so wording more in line with 2.1 might be considered.

Water use is an important issue to monitor, especially for crops that are irrigated (rather than rain-fed agriculture) and in water scarce regions, which can include large parts of the Mediterranean region in Europe. A report for the European Commission in 2020 in the context of bioenergy quotes⁶⁰: “40% of Europe’s water abstraction can be attributed to agricultural activities. Especially in southern Europe, this figure can exceed 80% in the summer months. Water scarcity arises as a consequence of the water demand and through reduced precipitation (e.g. rain, snow, fog). Between 2005 and 2016, crop production in Europe became 12% less water intensive. Due to more efficient irrigation techniques, a clear trend for absolute decoupling of total water input and gross value added in crop production has been observed. The total water input to crops decreased from 5 m³ to 4.4 m³ for each unit of gross value added generated. However, water scarcity is expected to become increasingly frequent and widespread in Europe in response to a changing climate, making this an important environmental pressure.

“Crop based bioethanol and biodiesel have by far the largest water footprint of the EU renewable energy sources, partly due to their vast consumption of soil moisture. Especially in southern Europe water consumption is linked to agriculture, where crops such as maize and sugar beet are often irrigated. Rapeseed and wheat have less impact on water abstraction, as these crops are often dependent on seasonal patterns of precipitation. Water use improvements can be obtained by more efficient irrigation methods or through more resilient crop selection.”

Who is responsible for this risk?

⁶⁰ Navigant – A Guidehouse Company, 2020, Technical assistance in realisation of the 5th report on progress of renewable energy in the EU, [Technical assistance in realisation of the 5th report on progress of renewable energy in the EU \(fraunhofer.de\)](https://www.fraunhofer.de/en/technical-assistance-in-realisation-of-the-5th-report-on-progress-of-renewable-energy-in-the-eu)

Especially if agricultural crops are irrigated, the farmer managing the agricultural land is responsible. Thus, sustainable water use is an issue that can be checked at the farm level.

How is the criterion covered by voluntary schemes?

Two of the agricultural voluntary schemes assessed covered this criterion (ISCC Plus and RSB Global), while REDCert2 does not (see table below). CORSIA also covers it in full, while the RTFO Meta-standard's coverage is dependent on local laws and regulations and therefore only provides partial coverage. Overall, the considerable coverage of this criterion by existing voluntary schemes indicates that it is relevant and auditable.

Voluntary scheme	Benchmark
ISCC Plus (Agriculture)	<i>"Irrigation water should only be abstracted in a way that recharge rates compensate for water abstraction."</i>
RSB Global	<i>"Water used for the operations shall not be withdrawn beyond replenishment capacity of the water table, watercourse, or reservoir from which the water comes."</i>
CORSIA sustainability criteria	<i>"Criterion 4.2: Operational practices will be implemented to use water efficiently and to avoid the depletion of surface or groundwater resources beyond replenishment capacities."</i>
RTFO Meta-standard	<p>Partial: Does not specify water use having to be below the natural restoration capacity. National and local laws might not cover criterion (completely)</p> <p><i>"4.1 Compliance with national laws and regulations relevant to contamination and depletion of water sources."</i></p>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Water scarcity already relevant issue now, will continue to grow	Not aligned with the REDII and IR thus difficult for the market
Covered by many international systems and relevant voluntary schemes and thus relevant	
Covered by two voluntary schemes and thus auditable	
Not covered by REDII	

C.1.3 Criterion 2.3 Agricultural biomass: Negative effects on water availability on other users and ecosystems are prevented or minimized.

What is the criterion and the risk it intends to mitigate?

The criterion aims to ensure that the amount of water withdrawn from the water system by those who manage the agricultural land does not deplete the water supply for those downstream who are dependent on the same water source (humans, animals and plants).

This criterion is especially relevant for water-scarce regions where there is a lot of agriculture. These areas are likely to increase in the future with climate change. Some of the

EU regions mentioned under criterion 2.2 could potentially be relevant risk areas for this criterion too.

Who is responsible for this risk?

The farmer managing the agricultural land unit is partially responsible, especially if their agricultural land is irrigated. However, there may also be other land owners within the watershed, for which the farmer is not responsible. The complexity is that even if the farmer grows the same crop with the same water requirement for years in a row, this farmer will initially be able to meet this criterion and later no longer be able to meet this criterion due to additional water consumers in the watershed. Therefore the criteria should be worded in a way that is within the farmer's sphere of influence.

How is the criterion covered by voluntary schemes?

All the relevant voluntary schemes (ISCC Plus, REDCert2 and RSB) are judged to cover this criterion, although they address it in different ways. For example, ISCC Plus relies on the concept of "protecting water rights" whereas REDCert2 includes the concept of "properly protecting and managing water resources" and RSB states "the operator shall assess the potential impacts [...]". The meta-standards both have partial coverage.

Due to the considerable coverage this criterion appears relevant, and the fact that the voluntary schemes cover the issue suggest it can be auditable.

Voluntary scheme	Benchmark
ISCC Plus (Agriculture)	<i>"Water rights have been legally obtained and the producer shall respect and protect existing water rights, both formal and customary, including the rights of pastoralists, indigenous people, artisanal fishers and other comparable users. No acquisition of new or modification of the existing rights can happen without the Free Prior and Informed Consent of the parties affected. The producer shall justify irrigation in light of the accessibility of water for human consumption."</i>
REDCert ² (REDCert EU)	<i>"In addition to the requirements under 4.4.10, water resources must be properly protected and managed. In general, water must be protected against pollution and run-off to ensure that enough water is supplied to humans, livestock and crops (in this particular order) in line with their needs."</i>
RSB	<i>"The operator shall assess the potential impacts of the operations on water availability within the local community and ecosystems during the screening exercise of the impact assessment process, and mitigate any negative impacts."</i>
CORSIA sustainability criteria	<i>Criterion 4.2: Operational practices will be implemented to use water efficiently and to avoid the depletion of surface or groundwater resources beyond replenishment capacities</i>
RTFO Meta-standard	<p><i>Partial: National and local laws might not cover criterion (completely)</i></p> <p><i>"4.1 Compliance with national laws and regulations relevant to contamination and depletion of water sources."</i></p>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Water scarcity already relevant issue now, will continue to grow	Responsibility of (and ability to check) the water balance outside the influence of the operator
Covered by many international systems and relevant voluntary schemes and thus relevant	Not aligned with the REDII and IR thus difficult for the market
Covered by two voluntary schemes and thus auditable	
Not covered by REDII	

C.2 Principle 4: Quality of ground and surface water

C.2.1 Criterion 4.1 Agricultural and forest biomass: Negative impacts of cultivation of agricultural or forest biomass, regarding water quality for other users and ecosystems, are prevented or minimized

What is the criterion and the risk it intends to mitigate?

This criterion aims to minimize negative effects on the water quality for others, caused by activities in the forestry or agricultural land management unit. There are three main activities that impact the quality of ground and surface water: Pesticide and fertilizer use, wastewater treatment and soil erosion.

Pesticide and fertilizer pollution is a risk that is mainly related to agricultural activities, because fertilizer use for forestry is limited compared to agriculture. Two important agricultural crops are oil palm and soy, mainly grown in South-east Asia and South America. In Malaysia oil palm plantations make up 77% of the land. Lack of fertilizer regulations in Malaysia cause oil palm to be a large part of river pollution. For soybean cultivation the biggest impact on water quality is caused by pesticide- and fertilizer use. These agrochemicals are used to efficiently manage farms of increasing size and to reduce labor costs. When sprayed on crops, a fraction of the applied pesticides may reach surface- and groundwater through drift, run-off or drainage. These chemicals are a source of nutrient pollution in rivers and lakes.

The second impact category on the quality of ground and surface water is the pollution of water caused by wastewater. During the processing of oil palm, for example, a by-product called POME (palm oil mill effluent) is produced. POME is often discarded in disposal ponds, resulting in the leaching of contaminants that can pollute the soil, and surface- and groundwater affecting biodiversity and human health.

Finally, soil erosion is a major cause of water quality issues, both for forestry and agriculture. The risk is higher in plantations and other clearcut areas because this leads to increased soil erosion. Soil erosion results in leaching of nutrients and organic matter, as rainwater can wash off soil and debris from the land into the rivers. Where water quantity is only relevant in a very limited selection of locations, water quality is relevant everywhere but heavily related to soil quality and erosion.

Who is responsible for this risk?

Responsibility for this risk is similar to water quantity. Forest owners or farmers can implement good agricultural practices to avoid chemical run offs or avoid soil erosion that would impact the water quality for other users. However, there may also be other land owners within the watershed, which can impact water quality for which the forest owner or farmer is not responsible.

How is the criterion covered by voluntary schemes?

As can be seen in the table below, criterion 4.1 is extensively covered: ISCC Plus (EU), REDCert2, RSB, PEFC and RSB Woody Biomass all explicitly cover it. Only FSC does not have a criterion on this topic, but it is mandatory under FSC for forest owners to do an environmental impact assessment before starting operations or implementing changes and this would cover water quality. Both Meta-standards also cover criterion 4.1. The extensive coverage of this criterion indicates a high degree of relevance and auditability.

Voluntary scheme	Benchmark
ISCC Plus (Agriculture)	<i>"Good agricultural practices should be implemented with respect to reducing unsustainable water use, the abstraction of unsustainable water sources and minimising diffuse and localized pollution from chemical residues, fertilisers, soil erosion or other sources of ground and surface water."</i>
REDCert ² (REDCert EU)	<i>"Producers may not release harmful substances into groundwater as defined in Annex I of Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration and in Annex II Part B of Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration."</i> <i>"Producers must also prevent indirect discharge of the dangerous substances as defined in Annex I of Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration and Annex II Part B of Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration into the groundwater."</i>
RSB	<i>"Operators shall implement the best available practices which aim to maintain or enhance the quality of surface and groundwater resources that are used for the operations to the level deemed optimal for the local system for sustained water supply, ecosystem functioning and ecological services."</i>
PEFC	<i>"The standard requires that special care shall be given to forestry operations in forest areas with water protection functions to avoid adverse effects on the quality and quantity of water resources. Inappropriate use of chemicals or other harmful substances or inappropriate silvicultural practices</i>

Voluntary scheme	Benchmark
	<i>influencing water quality in a harmful way shall be avoided. Downstream water balance and water quality shall not be significantly affected by the operations."</i>
RSB woody biomass	<i>"The operator shall provide evidence about the implementation of practices to maintain or enhance the quality of the surface and groundwater resource, specifically practices to a) prevent the contamination of surface and/or groundwater from run-off and leaching of water containing chemical or biological agents;"</i>
CORSIA sustainability criteria	<i>"Criterion 4.2: Operational practices will be implemented to maintain or enhance water quality."</i>
RTFO Meta-standard	<i>"4.2 Application of good agricultural practices to reduce water usage and to maintain and improve water quality."</i>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Water quality is a significant issue, especially related to agricultural activities	For forestry, could be disproportionate as water quality can be ensured by taking measures to ensure soil quality and prevent erosion
Covered by many international systems and relevant voluntary schemes and thus relevant	Not aligned with the REDII and IR thus difficult for the market
Covered by two voluntary schemes and thus auditable	
Not covered by REDII	

C.3 Principle 5: Good agricultural practice and forest management

C.3.1 Criterion 5.1 Forest biomass: The use of chemicals is only allowed if maximum use of ecological processes and sustainable alternatives prove to be insufficient. The use of pesticides classified by the World Health Organization as type 1A and 1B and chlorinated hydrocarbons is not permitted.

What is the criterion and the risk it intends to mitigate?

This criterion aims to minimize the use of chemicals and to eliminate the use of the World Health Organisation (WHO) type 1A and 1B pesticides, as well as chlorinated hydrocarbons. Type 1A pesticides are classified as extremely hazardous, whereas 1B pesticides are classified as highly hazardous.⁶¹ The use of chlorinated hydrocarbons also comes with significant human and environmental health risks.⁶²

⁶¹ World Health Organization, 2019, The WHO Recommended Classification of Pesticides by Hazard, [The WHO Recommended Classification of Pesticides by Hazard and guidelines to classification, 2019 edition](#)

⁶² European Environment Agency, n.d., [chlorinated hydrocarbon — European Environment Agency \(europa.eu\)](#)

Pesticides are rarely used in natural forestry. They are however sometimes used in plantations.⁵⁹

According to the FSC expert interviewed, the WHO classification is outdated and hardly used in practice.⁵⁹ The WHO classification also only considers impacts on human health and not on biodiversity. Nowadays, the pesticide collections as defined in the Stockholm and Rotterdam convention are deemed more relevant, and including these in voluntary schemes is deemed best practice. Furthermore, voluntary schemes aim to stimulate the use of a least harmful overall methodology by implementing a risk assessment. This not only includes the type of pesticide used but also considers the reason for use, the amounts used and the manner of application. Most of the times this leads to the exclusion of WHO pesticides as better alternatives are often available.

Who is responsible for this risk?

The entity managing the forest land is responsible for which pesticides are used.

The local government is responsible for ensuring adequate legislation on pesticide use is in place.

How is the criterion covered by voluntary schemes?

ISCC Plus (EU) is the only voluntary scheme that encompasses criterion 5.1 via its Forest Biomass Principles, almost to the letter. RSB almost fully covers the criterion but does not immediately prohibit the use of WHO type 1A and 1B pesticides and chlorinated hydrocarbons as it allows for a phasing out period of three years. FSC also adheres to the first part of the criterion but does not include all WHO type 1A and 1B pesticides in its list of prohibited pesticides and includes the concept of repair if these chemicals are used. For REDCert2 it's the other way around, as it does prohibit the use of these pesticides but does not mention anything about maximizing the use of ecological processes and sustainable alternatives before using chemicals. ICAO partially covers the criterion as it stimulates minimising the use of pesticides. It does not however mention WHO 1A and 1B pesticides, or chlorinated hydrocarbons.

In its current form, this criterion appears to be missing elements that could lead to a better coverage of the risk that it intends to counteract.⁵⁹ The aim should be to stimulate the use of the pesticide with the least harmful impacts in combination with the application method with the least harmful impacts. In its current form the criterion bans the most detrimental option, but leaves room for other options that might only be slightly less harmful but whose use limits the development of significantly less impactful methods in the long term as there is no direct need. This is why existing voluntary schemes like FSC have implemented a cascading principle that encourages the use of the least harmful option but relates the absolute amount of harmful pesticides used to the amount of research that must be done into alternatives.⁵⁹

Overall, pesticides are covered by all voluntary schemes but the two components of this criterion are rarely both covered within one scheme. Minimising pesticide use is therefore relevant but it might be advisable to address the wording of the criteria to allow for different approaches by voluntary schemes.

Voluntary scheme	Benchmark
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ISCC Plus (forestry)	<p><i>"The use of chemical pesticides is only permitted as the last option and only if ecological processes and the optimal deployment of sustainable alternatives prove insufficient. Chemical pesticides classified as Type 1A and 1B by the World Health Organization (WHO), chlorinated hydrocarbons as well as in Annex III of the Rotterdam Convention (UNEP's Prior Informed Consent (PIC) Program list) are not permitted under ISCC."</i></p>
REDCert2	<p>Partial: nothing is said about restricting use of chemicals to a minimum.</p> <p><i>"Chemicals in plant protection products included in the lists of WHO classes 1a and 1b may not be used."</i></p>
RSB	<p>Partial: Nothing is said about chlorinated hydrocarbons and phase out can be over 3 years.</p> <p><i>"None of the chemicals recorded in the WHO's 1a and 1b lists shall be used. The use of chemicals recorded in Annex III of the Rotterdam Convention, in the Stockholm Convention on Persistent Organic Pollutants (POPs) and the Montreal Protocol on Substances that Deplete the Ozone Layer shall be listed (type and annual volume used) and a plan to phase out any such chemical over the three years following certification shall be described in the ESMP."</i></p>
PEFC	<p>Partial: Exceptions that allow the use of WHO 1A/B pesticides can be made.</p> <p><i>"The standard requires that the WHO Class 1A and 1B pesticides and other highly toxic pesticides shall be prohibited, except where no other viable alternative is available. Any exception to the usage of WHO Class 1A and 1B pesticides shall be defined in the national/regional standard."</i></p>
FSC	<p>Partial: not all WHO 1A/B pesticides are on the FSC prohibited list, some are on the highly restricted and restricted lists.</p> <p><i>"The Organization* shall use integrated pest management and silviculture* systems which avoid, or aim at eliminating, the use of chemical pesticides*. The Organization shall not use any chemical pesticides prohibited by FSC policy. When pesticides are used, The Organization shall prevent, mitigate, and / or repair damage to environmental values* and human health."</i></p>
CORSIA sustainability criteria	<p>Partial: nothing is said about the prohibition of WHO 1A and 1B pesticides and chlorinated hydrocarbons.</p> <p><i>"Criterion 8.2: Responsible and science-based operational practices will be implemented to limit or reduce pesticide use."</i></p>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Pesticide use is a relevant issue in forestry, it cannot be assumed that it is never used	Only covered by ISCC Plus (forestry) in full. Other schemes cover pesticides but in different ways, thus a different wording or more flexible approach might be advised
Not covered by REDII	The WHO pesticide lists are deemed outdated (criterion 5.4 includes other lists for agriculture)
	The current formulation of the criterion is not specific enough. A cascading principle is missing, meaning development of less impactful alternatives is hindered.
	Not aligned with the REDII and IR thus difficult for the market

C.3.2 Criterion 5.2 Agricultural biomass: The use of chemical agents shall be minimized wherever possible by applying integrated pest management (IPM) and other sustainable agricultural practices.

What is the criterion and the risk it intends to mitigate?

This criterion aims to minimize overapplication of chemical agents in agriculture to protect biodiversity, and to encourage application of integrated pest management (IPM). IPM is a pest management approach that combines information on pest lifecycles with available pest control methods to manage pest damage in the most economical manner while also minimizing hazards to people, property and the environment.

Who is responsible for this risk?

The farmer is responsible for their approach to managing pests and which chemical agents are used.

How is the criterion covered by voluntary schemes?

All three voluntary schemes applicable to agricultural biomass within the scope of this study, cover criterion 5.2 in full: ISCC Plus (EU), REDCert2, and RSB. No additional criteria or principles related to 5.2 are included in RSB Advanced Products. None of the meta-standards explicitly cover IPM. However as it is covered by all three voluntary schemes, the application of IPM seems like a relevant and auditable criterion to include.

Voluntary scheme	Benchmark
ISCC Plus (agriculture)	<p><i>“In addition, the producer must be able to show evidence that in situations where a pest attack adversely affects the economic value of a crop, intervention with specific pest control methods will take place. Wherever possible, non-chemical approaches and measures to avoid crop disease and cross-contamination must be considered. (...) The different activities shall be applied in such a way that they build an integrated strategy of IPM, leading to a decrease in the use of chemicals while at the same time an increase in the safety and quality of the raw materials.”</i></p>
REDCert2 (REDCert EU)	<p><i>“Another important aspect of “Good Agricultural Practice” is integrated pest management (IPM). The goal is to ensure that products are safe and of high quality while minimising the use of pesticides and other chemical plant protection products. This goal is achieved through various preventative measures. It requires continuous monitoring and analysis of all conditions that affect plant growth. Producers must keep proof of their IPM activities and assess their production processes in relation to integrated pest management processes.”</i></p>
RSB	<p><i>“The operator shall implement and monitor Integrated Pest Management techniques (IPM) that are adequate for the target crop to reduce the development of pest populations and minimise risks to human health and the environment. “IPM is the careful consideration of all available pest control techniques and subsequent integration of appropriate measures to discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimise risks to human health and the environment. IPM emphasises the growth of a healthy crop with the least possible disruption to agro-ecosystems and encourages natural pest control mechanisms.”</i></p>
CORSIA sustainability criteria	<p>Partial: nothing is said about the use of IPM</p> <p><i>“Criterion 8.2: Responsible and science-based operational practices will be implemented to limit or reduce pesticide use.”</i></p>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
<p>Covered by two out of three international systems and all relevant voluntary schemes and thus relevant</p>	<p>Wording sounds like IPM is required, which may be quite strict. May wish to take more flexible approach (but seems to be well covered by schemes)</p>

Covered by all relevant voluntary schemes and thus auditable

Not aligned with the REDII and IR thus difficult for the market

Not covered by REDII

C.3.3 Criterion 5.3 Agricultural biomass: Only registered plant protection products are used. The application of agricultural chemicals is documented and all operations, storage, collection and disposal of chemical waste and empty containers are monitored to ensure compliance with good practices. Chemicals are stored and disposed of safely.

What is the criterion and the risk it intends to mitigate?

This criterion is designed to make sure that agricultural chemicals are handled and disposed of in a responsible and safe manner – both to protect the environment and human users of the chemicals.

Who is responsible for this risk?

The farmer is responsible for ensuring safe use and disposal by setting out appropriate facilities and relevant safety protocols for all workers to follow.

How is the criterion covered by voluntary schemes?

All three voluntary schemes applicable to agricultural biomass cover criterion 5.3 in full: ISCC Plus (EU), REDCert2, and RSB. No additional criteria or principles related to 5.3 are included in RSB Advanced Products. CORSIA covers the responsible use of chemicals and treatment of waste, but does not say anything about only using registered plant protection products. The RTFO Meta-Standard refers to national and local laws, meaning coverage of this criterion is context dependent. All relevant voluntary schemes covering this criterion indicates its relevance and auditability.

Voluntary scheme	Benchmark
ISCC Plus (agriculture)	<i>“All plant protection products applied must be officially registered in the country of use for the target crop or permitted by the appropriate governmental organisation in the country of application where such an official registration scheme exists. Where no official registration scheme exists, refer to the FAO International Code of Conduct on the Distribution and Use of Pesticides.”</i>
REDCERT2 (REDCert EU)	<i>“Application and handling of plant protection products Producers are not allowed to handle or apply plant protection products (PPP) that are not officially approved and registered for a specific target crop. This also explicitly includes local or temporary restrictions on application, e.g. in protected areas or in places where “incidents” have already occurred.”</i>

Voluntary scheme	Benchmark
RSB	<p><i>"Manufacturer's safety instructions for the storage, handling, use, and disposal of chemicals shall be followed."</i></p> <p><i>"Records of the pesticides use shall be kept, including at least the justification why the application is needed, the name of the pest treated, the product specification of the pesticide, the content of active ingredients, the amount applied per ha, location, date, target crop and number of applications)."</i></p>
CORSIA sustainability criteria	<p>Partial: nothing is said about the use of registered plant products only.</p> <p><i>Criterion 8.1: Operational practices will be implemented to ensure that waste arising from production processes as well as chemicals used are stored, handled, and disposed of responsibly.</i></p>
RTFO Meta-Standard	<p>Partial: National and local laws might not cover criterion (completely)</p> <p><i>"Evidence of compliance with national and local laws and regulations with respect to:</i></p> <ul style="list-style-type: none"> <i>- pesticides and agrochemicals;</i> <p><i>The company should prove that:</i></p> <ul style="list-style-type: none"> <i>- it is familiar with relevant national and local legislation;</i> <i>- it complies with these legislations;</i> <i>- it remains informed on changes in legislation"</i>

Pros and Cons of keeping this criterion.

Arguments to keep the criterion	Arguments to drop the criterion
Covered by all relevant voluntary schemes and thus relevant and auditable	Only covered by one international system
Not covered by REDII	Not aligned with the REDII and IR thus difficult for the market

C.3.4 Criterion 5.4 Agricultural biomass: The use of pesticides listed in the Rotterdam Convention and in the Stockholm Convention on Persistent Organic Pollutants (POPs) is not allowed.

What is the criterion and the risk it intends to mitigate?

This criterion aims to stop the use of pesticides listed in the Rotterdam and Stockholm conventions, which can have serious impacts on human health and/or the environment.^{63,64}

⁶³ U.S. Department of State, n.d., [Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade - United States Department of State](#)

⁶⁴ U.S. Department of State, n.d., [Stockholm Convention on Persistent Organic Pollutants - United States Department of State](#)

Around 73% of the chemicals covered by the Rotterdam Convention and 70% of the chemicals covered by the Stockholm Convention are pesticides. Pesticides listed in both conventions are often produced in or exported to developing countries.⁶⁵

Who is responsible for this risk?

The farmer is responsible for which pesticides are used.

How is the criterion covered by voluntary schemes?

ISCC Plus is the only voluntary scheme that forbids the use of Rotterdam and Stockholm convention pesticides for agricultural biomass production immediately. REDCert2 provides the possibility for use of POPs in case there are no alternatives, whereas RSB mandates a phase out over the course of three years following certification. The RTFO meta-standard mentions the Stockholm convention but not the Rotterdam convention. All relevant voluntary schemes seem to agree that the use of Rotterdam and Stockholm convention pesticides is undesirable, indicating the relevance and auditability of this criterion.

Voluntary scheme	Benchmark
ISCC Plus (agriculture)	<i>Chemicals listed in the Stockholm Convention on Persistent Organic Pollutants must not be applied on any (own and leased) land of the farm/plantation.⁷ The use of chemicals in plant protection products listed in the WHO classes 1a and 1b lists as well as in Annex III of the Rotterdam Convention (UNEP's Prior Informed Consent (PIC) Program list) is also not allowed under ISCC</i>
REDCert ²	<p data-bbox="549 1099 1396 1205"><i>Partial: It mandates a phasing out of the use of Rotterdam/Stockholm pesticides but allows for an evaluation if no alternatives can be found.</i></p> <p data-bbox="549 1245 1396 1317"><i>"Producers may not use chemicals listed in the Stockholm Convention on Persistent Organic Pollutants."</i></p> <p data-bbox="549 1357 1396 1664"><i>"Chemicals listed in Annex III to the Rotterdam Convention (UNEP Prior Informed Consent (PEP) programme list) must be avoided and alternatives considered if any are available on the market. There must be a scenario in place to phase out the use of chemicals to be avoided in order to ensure that none of these substances are still in use by January 2023. In cases where there are no alternatives to one of these chemical substances, an external assessor must be consulted to carry out an evaluation."</i></p>
RSB	<p data-bbox="549 1671 1396 1742"><i>Partial: It mandates a phasing out of Rotterdam/Stockholm pesticides if they are currently in use.</i></p> <p data-bbox="549 1783 1396 1948"><i>"The use of chemicals recorded in Annex III of the Rotterdam Convention, in the Stockholm Convention on Persistent Organic Pollutants (POPs) and the Montreal Protocol on Substances that Deplete the Ozone Layer shall be listed (type and annual volume used) and a plan to phase out any such chemical over</i></p>

⁶⁵ [Pesticides \(pic.int\)](#)

the three years following certification shall be described in the ESMP."

RTFO Meta-standard

Partial: Mentions Stockholm convention but not Rotterdam

"Evidence of compliance with national and local laws and regulations with respect to:

- Compliance with the Stockholm convention (list of forbidden pesticides)."

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Covered by a voluntary scheme thus auditable	Only covered by one international system and one voluntary scheme, which could indicate its relevance is limited (can also be because there are several different criteria which aim to address pesticides).
Not covered by REDII	Several criteria related to pesticides – approach should be streamlined
	Not aligned with the REDII and IR thus difficult for the market

C.3.5 Criterion 5.5 Agricultural biomass: The use of pesticides classified by the World Health Organization as type 1A and 1B and chlorinated hydrocarbons is not allowed.

What is the criterion and the risk it intends to mitigate?

This criterion aims to minimize the use of chemicals and to eliminate the use of WHO type 1A and 1B pesticides, as well as chlorinated hydrocarbons. Type 1A pesticides are classified as extremely hazardous, whereas 1B pesticides are classified as highly hazardous.⁶⁶ The use of chlorinated hydrocarbons also comes with significant human and environmental health risks.⁶²

Who is responsible for this risk?

The farmer is responsible for which pesticides are used.

How is the criterion covered by voluntary schemes?

ISCC Plus's agriculture module allows for the use of WHO 1A and 1B pesticides if no alternatives are available whereas REDCert2 and RSB prohibit their use altogether. While ISCC Plus prohibits the use of chlorinated hydrocarbons, both REDCert2 and RSB do not mention anything about this. This could indicate that prohibiting their use is not relevant. The voluntary schemes do however seem to agree on the fact that the use of WHO 1A and 1B pesticides is undesirable.

⁶⁶ World Health Organization, 2019, The WHO Recommended Classification of Pesticides by Hazard, **The WHO Recommended Classification of Pesticides by Hazard and guidelines to classification, 2019 edition**

Voluntary scheme	Benchmark
ISCC Plus (agriculture)	<p>Partial: It mandates a phasing out of the use of WHO 1A and 1B pesticides but allows for an evaluation if no alternatives can be found.</p> <p><i>"The use of chemicals in plant protection products listed in the WHO classes 1a and 1b lists as well as in Annex III of the Rotterdam Convention (UNEP's Prior Informed Consent (PIC) Program list) is also not allowed under ISCC. Alternatives should be taken into consideration where available and a phase-out shall be considered. In case chemicals listed in WHO 1a or 1b are still in use, a phase-out plan must be in place ensuring that none of these substances will be used anymore by January 2023. In cases where there are no alternatives to a chemical substance named in WHO 1a and 1b, an external expert must be consulted to confirm this. This expert must have the professional background and expertise to analyse the situation appropriately and take a decision. Some of the WHO 1a and 1b chemicals and chemicals listed in the Rotterdam Convention are not covered under current EU legislation – therefore this requirement must be verified by the auditor for farmers covered under EU cross compliance as well."</i></p>
REDCert ²	<p>Partial: does not mention chlorinated hydrocarbons</p> <p><i>"Chemicals in plant protection products included in the lists of WHO classes 1a and 1b may not be used."</i></p>
RSB	<p>Partial: does not mention chlorinated hydrocarbons</p> <p><i>"None of the chemicals recorded in the WHO's 1a and 1b lists shall be used."</i></p>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Covered (partially) by the voluntary schemes, thus relevant and auditable	Not covered (in full) by any international systems or voluntary schemes, meaning relevance could be limited
Not covered by REDII	The WHO pesticide lists are deemed outdated
	Several criteria related to pesticides – approach should be streamlined
	Not aligned with the REDII and IR thus difficult for the market

C.3.6 Criterion 5.6 Agricultural biomass: The producer applies good agricultural practices on his land

This criterion is further made up of three parts:

- **Soil quality** is maintained and where possible improved through good nutrient balance.
- **Erosion** is prevented, through good agricultural practices.
- **(Bio)diversity** on the land: crop rotation and natural vegetation around springs and along natural watercourses is maintained and, where possible, restored.

What is the criterion and the risk it intends to mitigate?

This is a broad criterion, which aims to promote good agricultural practices to maintain soil quality, prevent erosion and to promote diversity of crops grown and protect biodiversity around watercourses.

Who is responsible for this risk?

The farmer is responsible for applying good agricultural practices. Local guidelines may be provided, for example through national law or in the EU via the Common Agricultural Policy.

How is the criterion covered by voluntary schemes?

Criterion 5.6 is the most multifaceted of the ones included in this analysis, as it consists of three separate components. ISCC Plus’s agricultural module is the only scheme to cover all three of these in detail. REDCert2 encompasses two out of three extensively, not providing guidance on biodiversity on the land. This is the same for RSB albeit in a more concise manner. Both meta-standards cover 5.6 partially. Overall, while soil quality and erosion are often-covered, biodiversity specially around water courses is not. The latter might therefore be too specific to include in the criteria, and a more flexible approach to the criterion wording might be considered.

Voluntary scheme	Benchmark
ISCC Plus (agriculture)	<p><i>Crops should be grown on suitable soils. To ensure the sustainable treatment of soils, good agricultural practices concerning soil quality, soil contamination and soil erosion are addressed as part of soil management. They may refer to:</i></p> <ul style="list-style-type: none"> > <i>The prevention and control of erosion;</i> > <i>Maintaining and improving soil nutrient balance;</i> > <i>Maintaining and improving soil organic matter;</i> > <i>Maintaining and improving soil pH;</i> > <i>Maintaining and improving soil structure;</i> > <i>Maintaining and improving soil biodiversity;</i> > <i>The prevention of salinization</i> > <i>Maintaining water holding capacity</i> > <i>Maintaining base saturation</i> > <i>Determination of soil organic carbon content</i> <p><i>Measures and cultivation techniques are used to reduce the risk of soil erosion. Maps of fragile soils and topographic characteristics must be available. A management strategy</i></p>

Voluntary scheme	Benchmark
	<p><i>including measures should exist for planting on slopes above a certain limit (specified in terms of soil, climate and topographical characteristics) and for other fragile and problematic soils (e.g. sandy, low organic matter soils).</i></p> <p><i>The producer knows the status of riparian vegetation around springs and natural watercourses. Appropriate riparian buffer zones (in accordance with applicable national and regional legislation or based on FAO guidance) to protect watercourses and wetlands are established, maintained and restored, taking into consideration the impacts of crop planting, the application of fertilisers and plant protection products, and harvesting. Where natural vegetation in riparian areas has been removed in compliance with Principle 1, there is a plan with a timetable for recovery.</i></p>
<p>REDCert²</p>	<p>Partial: nothing is said about the biodiversity aspect of the criterion</p> <p><i>"Producers therefore need to implement practices that reduce nitrate pollution taking into consideration the specific farming conditions in their region and the type of crop. These include:</i></p> <ul style="list-style-type: none"> <i>- creating a crop nutrient balance taking into account nutrient inputs in relation to crop offtake (input = every kind of fertiliser; crop offtake = everything that is harvested including straw and co-products) or documenting the fertiliser or nutrient quantities actually applied"</i> <p><i>"Producers have to protect the soil from erosion by means of appropriate measures. "Good agricultural practices" include several measures to prevent erosion. This requires > a basic evaluation of the farmland with regard to its potential risk of erosion, which can be derived from the length of the slope, slope gradient, type of soil, soil cover (tillage method, crop rotation) and, in particular, from empirical values (the potential soil erosion to be determined (e.g. by means of a soil erosion equation) must not, however, be equated with the actual soil erosion), as well as > precautionary measures derived from this, which must be based on the assessment of the potential risk. The challenge is to maintain the natural soil structure while lowering the risk of erosion caused by wind and water and to minimise the amount of time the soil is uncovered (necessarily). Areas with a higher potential for or risk of erosion should be identified and subject to special monitoring. Special attention should be paid to very sandy soils and land on slopes. Minimum requirements to reduce the risk of erosion are therefore defined, depending on the degree of water or wind erosion risk on agricultural land. As guidance for risk assessment and the minimum requirements derived from it, the REDCert-EU scheme refers to the recommendations of good agricultural and environmental condition and the provisions of cross-compliance to limit soil erosion during</i></p>

Voluntary scheme

Benchmark

tillage. The following therefore applies:

> Cropland assigned to the water erosion category CCWater1 and not included in a special erosion control measure may not be ploughed from 1 December to the end of 15 February.

Ploughing after the previous crop has been harvested is permitted only if sown before 1 December. Where cultivation occurs perpendicular to the slope, these two restrictions on ploughing do not apply. Scheme principles for the production of biomass, biofuels, bioliquids and biomass fuels © REDCert GmbH 26

> If cropland is assigned to the water erosion category CCWater2 and is not included in a special erosion control measure, it may not be ploughed between 1 December and 15 February. Ploughing between 16 February and the end of 30 November is allowed only right after sowing. The latest date for sowing is 30 November. Ploughing is prohibited before sowing row crops with row spacing of 45 centimetres or more.

> If cropland is assigned to the wind erosion category CCWind and is not included in a special erosion control measure, it may only be ploughed if sown before 15 March. Deviating from this rule, ploughing is only permitted from 1 March onwards, except in the case of row crops with row spacing of 45 centimetres or more, when sowing takes place immediately afterwards. The ban on ploughing of row crops does not apply where, before 1 December, green strips at least 2.5 metres wide and at a distance of not more than 100 metres are sown perpendicular to the main wind direction, or in the case of crops grown in embankments, where the embankments are positioned perpendicular to the main wind direction, or where seedlings are planted immediately after ploughing.

"The soil protection function of structural elements in the agricultural area primarily extends to the reduction of soil erosion by wind and water on cropland. As a result, the structural elements required for soil protection should be preserved and, if necessary, supplemented. This includes, in particular:

> structural elements to reduce wind erosion on farmland, such as permeable hedges/windbreak plantings, sufficiently dense rows of trees, possibly also other woodland plantings or landscape features that increase the roughness of the terrain, and

> structural elements to reduce water erosion on farmland, such as farmland terraces, roadways with borders, copses, absolute grassland and other small structures, ditches across the gradient, grass strips/margins with sufficiently deep marginal fur rows and sufficient width across the gradient, hedges with undergrowth and sufficiently deep furrows at the edges as well as sufficient width perpendicular to the direction of the slope, in each case within and/or above the field,

Voluntary scheme	Benchmark
RSB	<p><i>permanent grassland on slopes, in hollows, in former valley paths and deep gullies to slow down runoff and erosion."</i></p> <p>Partial: nothing is said about the biodiversity aspect of the criterion</p> <p><i>"Operators shall implement practices to maintain and improve the soil nutrient balance and reduce nitrate pollution."</i></p> <p><i>"Soil erosion shall be minimised through the design of the feedstock production site and use of sustainable practices in order to enhance soil physical health on a watershed scale."</i></p>
CORSIA sustainability criteria	<p>Partial: Does not cover erosion and biodiversity around springs and natural watercourses</p> <p><i>"Criterion 5.1: Operational practices will be implemented to maintain or enhance soil health, such as physical, chemical and biological conditions."</i></p>
RTFO Meta-standard	<p>Partial: Does not cover biodiversity around springs and natural watercourses</p> <p><i>"3.2 Application of good agricultural practices with respect to:</i></p> <ul style="list-style-type: none"> <i>- prevention and control of erosion;</i> <i>- maintaining and improving soil nutrient balance;</i> <i>-maintaining and improving soil organic matter;</i> <i>-maintaining and improving soil pH;</i> <i>-maintaining and improving soil structure;</i> <i>-maintaining and improving soil biodiversity;</i> <i>-prevention of salinisation."</i>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Covered by many international systems, indicating relevance	Only covered in full by one voluntary scheme, more flexible wording could be considered especially related to biodiversity around watercourses, which is not always specifically covered
Covered by a voluntary scheme thus auditable	Covered by EU Common Agricultural Policy (and in other places by local guidelines)
Not covered by REDII	Not aligned with the REDII and IR this difficult for the market

C.4 Principle 6: Responsible waste management

C.4.1 Criterion 6.1 Agricultural and forest biomass: The generation of inorganic waste and litter shall be prevented or collected, stored at the specified location(s) and disposed of in an environmentally responsible manner

What is the criterion and the risk it intends to mitigate?

This criterion aims to prevent the generation and accumulation of inorganic waste in agricultural and forest land management units.

Inorganic waste such as plastic packaging is clearly identifiable and has received considerable attention in recent history. Because of this, a lot of work is already being done to counteract this risk.⁵⁹ In general, the higher the degree to which the land is used, the higher this risk. More inorganic waste is produced on plantations than in natural forest. The overall aim should be to determine whether the inadequate disposal of inorganic waste is structural or incidental. This risk could occur in most locations.

Who is responsible for this risk?

Responsibility for this risk is with the entity managing the land. Waste disposal is usually covered by national laws and the farmer / forest owner is responsible for ensuring legislation is followed, which also goes for those being physically present on the site like site managers and employees.

How is the criterion covered by voluntary schemes?

ISCC Plus is the only voluntary scheme to cover criterion 6.1 in full via their agriculture module, and the overlap is considerable. Other voluntary schemes partially cover this criterion. FSC covers 6.1 partially but does not mention anything about inorganic waste or preventing its generation or its storage. PEFC does not refer to preventing waste generation, and RSB refers to waste in general rather than inorganic waste specifically. The RTFO meta-standard only covers a very slight aspect of this criterion. Overall, the coverage of this criterion by schemes is relatively low, which suggests its relevance is rather lower than other criteria or addressing inorganic waste is rather obvious.

Voluntary scheme	Benchmark
ISCC Plus (agriculture)	<p><i>The accumulation of inorganic waste, plastic waste and litter is prevented, or such waste and litter is collected, stored in approved areas and disposed responsibly.</i></p> <p><i>National and regional legislation must be followed when storing and disposing of waste. The farm/plantation should have designated areas to store litter and waste which do not create a safety or health hazard. The risks of different types of waste are identified, and waste is stored according to risk identification. Especially, the disposal of hazardous waste must be done in a safe and environmentally-friendly way. Hazardous wastes include for example different types of waste include e.g. chemical waste, fuels, lubricants, batteries, tyres, etc.</i></p>

Voluntary scheme	Benchmark
	<p><i>Best practices must be addressed in the waste management plan. They refer to:</i></p> <p>> <i>The prevention of waste;</i></p>
RSB Global	<p>Partial: inorganic waste is not specified.</p> <p><i>"A waste and by-product management plan shall be included in the ESMP to ensure that wastes and byproducts are handled and/or disposed of in appropriate containers and to prevent any environmental contamination and damage to human health."</i></p>
FSC	<p>Partial: nothing is mentioned about inorganic waste, preventing its generation or its storage.</p> <p><i>"The Organization* shall dispose of waste materials in an environmentally appropriate manner."</i></p>
PEFC	<p>Partial: nothing is said about preventing waste generation.</p> <p><i>"The standard requires that the indiscriminate disposal of waste on forest land shall be strictly avoided. Non-organic waste and litter shall be collected, stored in designated areas and removed in an environmentally-responsible manner. The spillage of oil or fuel during forest management operations shall be prevented. Emergency procedures for the minimisation of risk of environmental harm arising from the accidental spillage shall be in place."</i></p>
RTFO Meta-standard	<p>Partial: Doesn't say anything about preventing the generation of (inorganic) waste and litter. National and local laws might not cover criterion (completely)</p> <p><i>"Evidence of compliance with national and local laws and regulations with respect to:</i></p> <p><i>- waste storage and handling;"</i></p>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Relevance confirmed by FSC expert	Not covered by any international systems, and only in full by one voluntary scheme indicating relevance could be limited
Auditability confirmed by FSC expert	Not aligned with the REDII and IR thus difficult for the market
It makes sense to ensure a level playing field for forestry and agriculture	
Covered by a voluntary scheme thus auditable	
Not covered by REDII	

C.4.2 Criterion 6.2 Agricultural biomass: Agricultural waste shall be reduced, reused and/or recycled. The use of agricultural residues shall not compromise the function of local use of by-products, soil organic matter or soil nutrient balance.

What is the criterion and the risk it intends to mitigate?

This criterion aims to minimize the unnecessary production of agricultural wastes. It also aims to ensure that using agricultural residues (i.e. for energy, chemicals or materials) does not impact existing local users of the material and that harvesting the material does not impact soil quality. For example, some straw is routinely ploughed back into the soil to maintain soil nutrients and soil structure. Some straw can be harvested for other uses, but to maintain soil quality, it should not be over-harvested. The appropriate maximum harvesting rate depends on site-specific factors including soil type and current soil quality.

It should be noted, that explicitly including the concept of “reducing, reusing and recycling” agricultural wastes only makes sense in this context where those materials do not have a use for chemicals or energy which this framework is expected to promote. It could be considered whether it is necessary to keep this part of the criteria wording.

Who is responsible for this risk?

The farmer is responsible for the appropriate harvesting rate of agricultural residues.

Farmers can be in a position to know other local uses of agricultural residues, however the use of the agricultural residues is more of a question for policy makers or biomass end users.

How is the criterion covered by voluntary schemes?

Criterion 6.2 is covered (word for word) by ISCC Plus’s agriculture module. REDCert2 covers a significant part but does not detail anything about affecting the local use of by-products, while RSB does not mention reducing, reusing and/or recycling agricultural residues. CORSIA covers the criterion in full, while the RTFO meta-standard only partially covers 6.2 and also only as a recommendation. This criterion is covered sparsely, meaning its relevance could be limited.

Voluntary scheme	Benchmark
ISCC Plus (agriculture)	<p>[Note we assume this was the criteria wording adapted for the NL Top criteria]</p> <p><i>Agricultural waste is reduced, reused and/or recycled. (...) The use of agricultural residues should not jeopardize the function of local uses of the co-products, soil organic matter or soil nutrients balance.</i></p>
REDCert ²	<p>Partial: nothing is said about affecting the local use of by-products.</p> <p><i>"Most agricultural residues, however, are not considered biodegradable waste that needs to be collected separately because it is not disposed of as waste. These kinds of residues are used, e.g. in accordance with agricultural soil use Article 17 Good professional agricultural practices in the law on the protection of harmful changes to the soil and the</i></p>

Voluntary scheme	Benchmark
	<i>remediation of contaminated sites (German Federal Soil Protection and Contaminated Sites Ordinance (Bundes-Bodenschutzgesetz - BBodSchG), to improve the soil structure, to maintain and encourage the biological activity of the soil and/or maintain the humus content of the soil typical for the location. Depending on the management method (intensive / conventional or extensive / ecological / organic / alternative) including the respective type of soil cultivation (conventional / turned or not ploughed / not turned / conserved), a certain coherence in the operational cycle is achieved (prevention – reuse – marketing)."</i>
RSB	<p>Partial: nothing is said about reducing, reusing and/or recycling or about other users of the materials.</p> <p><i>"The use of agrarian and forestry residual products for feedstock production, including lignocellulosic material, shall not be at the expense of long term soil stability and organic matter content."</i></p>
CORSIA sustainability criteria	<i>"Criterion 5.1: Agricultural and forestry best management practices for feedstock production or residue collection will be implemented to maintain or enhance soil"</i>
RTFO Meta-standard	<p>Partial: Recommendation only and does not say anything about reducing, reusing and/or recycling.</p> <p><i>"3.3 The use of agricultural residues does not jeopardise the function of local uses of the byproducts, soil organic matter or soil nutrients balance. (Recommendation)"</i></p>

Pros and Cons of keeping this criterion

Arguments to keep the criterion	Arguments to drop the criterion
Ensuring soil quality when harvesting agricultural residues is relevant, and is covered by the REDII	Reduce, reuse, recycle may not make sense in the context of agricultural wastes which can be used for chemicals or energy
Covered by a voluntary scheme thus auditable	<p>Only covered by one international system, and only in full by one voluntary scheme indicating either that relevance is limited or that there are other ways to address the issue.</p> <p>Use of residues is more a question for policy makers</p> <p>Sustainable harvesting rates already covered by REDII</p>

Appendix D. Implementing Regulation 2022/996

Box 4: IR 2022/996 Article 19 Implementation of the mass balance system

1. Voluntary schemes shall require the economic operators participating in the scheme to use a mass balance system, in accordance with Article 30(1) of Directive (EU) 2018/2001 that allows the mixing of raw material or fuels that differ in their sustainability and GHG emissions saving characteristics.
2. Voluntary schemes shall apply the following rules in the implementation of the mass balance system:
 - (a) raw material or fuels shall only be considered to be part of a mixture if they are mixed in a container, at a processing or logistical facility, or at a transmission and distribution infrastructure or site;
 - (b) different raw materials shall only be considered to be part of a mixture if they belong to the same product group, except where the raw material is mixed for the purpose of further processing;
 - (c) raw materials or fuels shall only be considered to be part of a mixture if they are physically mixed unless they are physically identical or belong to the same product group. Where raw materials or fuels are physically identical or belong to the same product group, they must be stored in the same interconnected infrastructure, processing or logistical facility, transmission and distribution infrastructure or site;
 - (d) fuels introduced into a logistical facility or a transmission or distribution infrastructure such as the gas grid or a pipeline network for liquid fuels, stored in LNG or other storage facilities shall only be considered to be part of a mixture pursuant to point (c) where that infrastructure is interconnected;
 - (e) economic operators shall be required to keep separate mass balances for raw materials and fuels which cannot be considered part of a mixture. Transfer of information about the sustainability and GHG emissions saving characteristics and sizes between different mass balances shall not be allowed. Pursuant to subparagraphs (a) to (c), raw materials inside biofuels, bioliquids or biomass fuels production facilities are considered to be part of a mixture. Therefore, the requirement to keep separate mass balances shall not apply to such facilities and a single mass balance can be kept;
 - (f) the mass balance system shall include information about the sustainability and the GHG emissions characteristics and quantities of raw material and fuels, including information about the quantities of raw material and fuels for which no sustainability or GHG characteristics have been determined;
 - (g) where a consignment of raw material or fuel is delivered to an economic operator that is not participating in a voluntary scheme or national scheme, the delivery shall be reflected in the mass balance by withdrawing an equivalent quantity of raw material or fuel. The type of fuel to be booked out shall correspond to the physical nature of the raw material or fuel delivered;
 - (h) where a consignment of fuel is used to comply with an obligation placed on a fuel supplier by a Member State, it shall be considered to be withdrawn from the mixture of the mass balance;
 - (i) where biofuels, bioliquids or biomass fuels are blended with fossil fuels, the information about the sustainability and GHG emissions saving characteristics assigned to the blend shall correspond to the physical share of the biofuel, bioliquids or biomass fuels in the blend. For biofuels and bioliquids, Member States may further check the veracity of this information in accordance with Article 23;
 - (j) the sustainability and GHG emissions saving characteristics of a consignment of raw material or fuel shall be considered as a set. Where consignments are withdrawn from a mixture, any of the sets of sustainability characteristics may be assigned to them provided that the sets of sustainability and GHG emissions saving characteristics are not split and the mass balance is achieved over the appropriate period of time;

- (k) where relevant for transparency reasons, the mass balance system shall include information on whether support has been provided for the production of the fuel or fuel precursor, and if so, the type of support;
- (l) the appropriate period of time for achieving the mass balance shall be 12 months for producers of agricultural biomass and forest biomass and first gathering points sourcing only agricultural biomass and forest biomass, and 3 months for all other economic operators. The start and end of the period shall be aligned with the calendar year or, where applicable, the four quarters of the calendar year. As alternatives to the calendar year, economic operators may also use either the economic year that they use for bookkeeping purposes or another starting point for the mass balance period, provided that the choice is clearly indicated and applied consistently. At the end of the mass balance period, the sustainability data carried forward should be equivalent to the physical stock in the container, processing or logistical facility, transmission and distribution infrastructure or site;
- (m) voluntary schemes shall specify the minimum set of sustainability and GHG emissions saving characteristics, in accordance with Annex I, that need to be passed down the supply chain as well as other information necessary to trace the consignments. In case of liquid or gaseous fuels introduced into an interconnected infrastructure and subject to the same mass balancing system, the respective sustainability and GHG emissions saving characteristics shall be assigned to the consignments entering and exiting the interconnected infrastructure. The voluntary schemes shall also ensure that economic operators correctly enter all relevant information in the Union database.

Appendix E. Dutch requirements for assurance for solid biomass used under the SDE+

The following requirements are included in the SDE+ for solid biomass. Voluntary schemes used for solid biomass in the Netherlands need to follow ISO 17065, 19011 and the eight points below.⁶⁷ As of January 2023, the ISO 17029 is relevant in the context of the SDE++ (and EU ETS) in the Netherlands (see section 4).

Box 5: Bijlage C. Beheerseisen

1. Er is een breed gedragen behoefte aan het schema en aan een conformiteitsbeoordeling die op grond van het schema wordt verricht.
2. De totstandkoming en het beheer van het schema is transparant en de deelname aan de totstandkoming en de verdere ontwikkeling van het schema staat open voor eenieder.
3. De werkwijzen in verband met de totstandkoming van het schema zijn vastgelegd en openbaar toegankelijk en betreffen ten minste de aan de totstandkoming deelnemende partijen en de wijze waarop besluiten over de totstandkoming worden genomen.
4. Bij de totstandkoming en het beheer van het schema wordt aantoonbaar deskundigheid ingebracht ten aanzien van de duurzaamheidseisen waarop het schema betrekking heeft.
5. Het schema is openbaar of is onder eerlijke, redelijke en niet-discriminerende voorwaarden toegankelijk.
6. De schemabeheerder behoudt het gebruik van het schema voor aan de conformiteitsbeoordelingsinstantie waarmee een overeenkomst is afgesloten, tenzij de schemabeheerder de enige conformiteitsbeoordelaar is.
7. De schemabeheerder heeft effectieve procedures geïmplementeerd voor de behandeling van klachten en beroepen. Beroepen worden behandeld door personen die niet direct betrokken zijn bij het ontwikkelen en het beheren van het document.
8. De schemabeheerder beschikt over een systeem van versiebeheer van het schema.

⁶⁷ <https://wetten.overheid.nl/BWBR0040431/2022-01-01#BijlageB>

Box 6: [Unofficial English translation] Annex C. Management requirements

1. There is a widely supported need for the scheme and for a conformity assessment to be carried out on the basis of the scheme.
2. The establishment and management of the scheme is transparent and participation in the establishment and further development of the scheme is open to everyone.
3. The working methods in connection with the development of the scheme are recorded and publicly accessible and concern at least the parties participating in the development and the way in which decisions about the development are made.
4. Demonstrable expertise is brought into the creation and management of the scheme with regard to the sustainability requirements to which the scheme relates.
5. The scheme is public or accessible under fair, reasonable and non-discriminatory conditions.
6. The scheme manager reserves the use of the scheme to the conformity assessment body with which an agreement has been concluded, unless the scheme manager is the sole conformity assessor.
7. The scheme manager has implemented effective procedures for handling complaints and appeals. Appeals are handled by individuals who are not directly involved in developing and managing the document.
8. The scheme manager has a system for version management of the scheme.

Appendix F. RTFO Norm for audit quality

The norm was developed by the UK Department for Transport, with the support of Ecofys (now Guidehouse), in 2008 as part of the development of the Renewable Transport Fuel Obligation for biofuels in the UK. Audit criteria are each assigned a conformance level of either 'major must' (mandatory) or 'minor must' (recommendation). This norm served as input to the development of the European Commission's assurance requirements under the RED.

Criterion	Norm	Conformance
Certification		
1. Requirements for Certification Bodies	ISO Guide 65: 1996, ISO 17021: 2006, or justified equivalents	Major must
Audit		
2. Management of the audit programme	ISO 19011: 2002, or justified equivalent	Major must
3. Audit frequency	Once every five years for a full certification audit and once a year for a surveillance audit.	Major must
4. Audit competency	ISO 19011:2002, or justified equivalent. Specific requirements relevant to the product that the CB is certifying should be added as training requirements where appropriate	Major must
5. Stakeholder consultation	To include a range of relevant stakeholders	Minor must
6. Public summaries of the certification audit	To include overall findings of the certification audit, any details of non-compliance and any issues identified during the stakeholder consultation. Information should be available in both English and the relevant local language(s), if applicable.	Minor must
Accreditation		
7. Accreditation process for Accreditation Bodies (ABs) 'Commitment to comply' with ISO 17011: 2004, or justified equivalent, independently peer-reviewed and approved by an auditor that is recognised by either ISEAL or the IAF.	'Commitment to comply' with ISO 17011: 2004, or justified equivalent, independently peer-reviewed and approved by an auditor that is recognised by either ISEAL or the IAF	Major must
Other		
8. Documentation management	Parties (and Certification Bodies): - shall have an auditable system for the evidence related to the claims they make or rely on - keep evidence for a minimum period of five years; and - accept responsibility for preparing any information related to the auditing of such evidence.	Major must