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Additional requirements for organisations sourcing forest biomass – RED II



**PEFC RED II
STANDARD**

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Contents

1. Scope	7
2. Normative references	8
3. Terms and Definitions	9
3.1 General.....	9
4. Requirements for the implementation of a mass balance system	19
4.1 General.....	19
4.2 Management system.....	21
4.3 Implementation of Due Diligence System	21
4.4 Identification of inputs and declaration of outputs.....	22
4.5 Mass balance system.....	27
4.6 Physical separation	33
5. Additional requirements for organisations supplying ligno-cellulosic material from residues and/or waste	34
5.1 General	34
5.2 Management of the waste and residues supplies.....	34
6. Requirements for the evaluation of Level B evidence for forest biomass	38
6.1 General requirements	38
6.2 Requirements for compliance with the RED II sustainability criteria of the harvesting operations at sourcing area (Level B), as per Article 29 (6 b) of the RED II Directive	38
6.3 Requirements for compliance with the RED II sustainability criteria for carbon stocks and sinks levels at a certified area (LULUCF), as per Article 29 (7 b) of the RED II Directive	44
7. GHG calculations requirements	53
7.1 General	53
7.2 GHGs from the production and use of biomass fuels before conversion into electricity, heating and cooling (E)	55
7.3 Emissions for forest based raw material extraction or cultivation (e _{ec}).....	56
7.4 Emissions for land use change (e _l)	56
7.5 Emissions for processing (e _p)	57
7.6 Emissions from transport and distribution (e _{td})	58
7.7 Emissions from the fuel in use (e _u).....	59
7.8 Emissions savings from soil carbon accumulation via improved management (e _{sca}).....	59

7.9	Emissions savings from CO2 capture and geological storage (e_{ccs})	59
7.10	Emissions savings from CO2 capture and replacement (e_{cor})	60
7.11	Allocation emissions	61
7.12	Calculation of GHG emissions from the production of heat and/or electricity from biomass fuels	63
7.13	Calculations of GHG emissions saving from biomass fuels compared to fossil fuels	65
Appendix 1 (informative):	RED II compliant - PEFC Declaration template	66
Appendix 2 (normative):	Typical and default values of greenhouse gas emissions savings for biomass fuels if produced with no net-carbon emissions from land-use change	68
Appendix 3 (normative):	Disaggregated default values for biomass fuels	72
Appendix 4 (informative):	Sources of information	77
Appendix 5 (informative):	Gap analysis between the PEFC Benchmark standard PEFC ST 1003, Sustainable Forest Management, and the additional SFM requirements to be implemented for Level B evidence	80
Appendix 6 (informative):	Sources of information and tools.....	87

Foreword

PEFC, the Programme for the Endorsement of Forest Certification, is a worldwide organisation promoting sustainable forest management through forest certification and labelling of forest-based products. Products with a PEFC claim and/or label offer assurances that the raw materials used in their manufacture originate from sustainably managed forests and Trees outside Forests (TOF) areas, recycled and controlled sources.

The PEFC Council endorses national and regional forest certification systems that comply with PEFC Council requirements. Systems are subject to regular evaluations.

This document had been developed in an open, transparent, consultative and consensus based process covering a broad range of stakeholders.

Introduction

The PEFC Council is the owner of the PEFC forest certification scheme. The PEFC Council has extended the existing scheme with new technical documentation (the PEFC RED II certification scheme) to be recognised by the European Commission as a voluntary scheme under *Directive (EU) 2018/2001 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources - recast* (hereinafter RED II), to allow PEFC chain of custody certified organisations to comply with the obligations from the RED II Directive.

The PEFC RED II certification scheme is built up over the PEFC Chain of Custody scheme, providing supplements and interpretations to the existing chain of custody requirements, as well as new requirements. It also includes additional requirements for chain of custody notified certification bodies and other technical requirements necessary to ensure the integrity, harmonised implementation, and consistency of the scheme, and to ensure that the scheme satisfies the needs and expectations of stakeholders and the market.

The scope of the PEFC RED II certification scheme is defined by the following attributes:

Type of biomass: Ligno-cellulosic material that is derived from forests (forest biomass and forestry residues); processing residues originating in forest-related industries and wastes.

Note: Biomass originating in agriculture, aquaculture, and fishery sources, including residues from related industries or processing, is not covered by the scope of the PEFC RED II certification scheme.

Type of fuel(s): Biomass fuels (pellets, wood chips and graded hog fuel) produced from ligno-cellulosic material for heating, cooling, and electricity production.

Note 1: “Bioliquids”, “biofuels”, “biogas”, “renewable liquid and gaseous transport fuels of non-biological origin” and “recycled carbon fuels” are not covered by the scope of the PEFC RED II certification scheme.

Note 2: Graded hog fuels are wood fuels that have pieces of varying size and shape, produced by crushing with blunt tools (this definition is based on ISO 16559).

Geographic coverage: Global

Chain of custody coverage: Full biomass supply chain

This standard is international, and the requirements can be implemented globally.

The PEFC RED II certification scheme requires that organisations supplying forest biomass and ligno-cellulosic material derived from processing residues originating in forest-related industries and wastes for the production of heat, cooling, or energy shall hold a PEFC RED II certificate and a PEFC chain of custody certificate, in order to make RED II compliant declarations and claims.

The assurance of compliance of forest biomass with the RED II sustainability criteria relies within the PEFC RED II certified organisation. When sourcing forest biomass, PEFC RED II certified organisations can source:

- a) Forest biomass produced in a country where there is a risk assessment recognised by PEFC that proves compliance at Level A with the RED II sustainability criteria. In those cases, the producer of the forest biomass does not need any additional PEFC certification.
- b) Forest biomass from a country where there is a risk assessment recognised by PEFC at Level A, however, the risk assessment does not prove full compliance at Level A or where such a country risk assessment does not exist. In those cases, the PEFC RED II certified organisation shall ensure that the forest biomass is PEFC certified (produced by a holder of a valid and recognised PEFC SFM certificate). In addition, the PEFC RED II certified organisation shall require the biomass producer to comply with the corresponding requirements in chapter 6 to prove compliance at Level B with the non-compliant RED II sustainability criteria at Level A. The PEFC RED II certified organisation shall require the producer of forest biomass to provide evidence of the compliance with the corresponding Level B requirements in chapter 6, including first or second party auditing of the implementation of those Level B requirements.

1. Scope

This standard provides interpretations and additional requirements to *PEFC ST 2002, Chain of Custody of Forest and Trees Based Products - Requirements* that PEFC chain of custody certified organisations shall implement to use the PEFC certification scheme for the purpose of RED II compliance and obtain a PEFC RED II certificate.

As part of the additional requirements, the standard defines the information that chain of custody certified organisations shall require from biomass producers when showing compliance with the RED II sustainability criteria through level B risk assessment. When showing compliance with the RED II sustainability criteria through level B risk assessment, chain of custody certified organisations shall source from PEFC certified forests.

Moreover, the standard establishes the GHG calculation methods that producers of electricity, heating and cooling from forest biomass and ligno-cellulosic material from residues and waste shall use to calculate their reduction on GHG emissions.

To implement the requirements of this standard and obtain a PEFC RED II certificate, organisations shall hold a valid PEFC recognised chain of custody certificate.

In this standard, the following verbal forms are used: “shall” indicates a requirement; “should” indicates a recommendation; “may” indicates a permission; “can” indicates a possibility or a capability. Further details can be found in the ISO/IEC Directives, Part 2.

2. Normative references

The following referenced documents are indispensable for the application of this standard. For both dated and undated references, the latest edition of the referenced document (including any amendment) applies.

ISO/IEC 17000, *Conformity assessment – Vocabulary and general principles*

ISO/IEC 17021-1, *Conformity assessment – Requirements for bodies providing audit and certification of management systems – Part 1: Requirements*

ISO/IEC 17065, *Conformity assessment – Requirements for bodies, certifying products, processes and services*

ISO/IEC 17067, *Conformity assessment - Fundamentals of product certification and guidelines for product certification schemes*

ISO 19011, *Guidelines for auditing Management systems*

PEFC ST 1003, *Sustainable Forest Management – Requirements (available from www.pefc.org)*

PEFC ST 1002, *Group Forest Management Certification – Requirements (available from www.pefc.org)*

PEFC ST 2001, *PEFC Trademarks Rules – Requirements (hereinafter PEFC Trademarks standard), (available from www.pefc.org)*

PEFC ST 2002, *Chain of Custody of Forest and Trees Based Products, Requirements (available from www.pefc.org)*

PEFC ST 2003, *Requirements for Certification Bodies providing certification against the PEFC International Chain of Custody Standard (available from www.pefc.org)*

PEFC ST 5003, *Additional requirements for certification bodies providing certification against PEFC ST 5002 – RED II*

PEFC ST 5004, *Requirements for the development of Level A risk assessments and its recognition by PEFC as per Article 29 (6a) and (7a) of the RED II Directive*

PEFC Template for the Assessment of the Risk at Level A against the RED II Sustainability Criteria for Forest Biomass sourced from [Geographical scope]

Directive (EU) 2018/2001 *on the promotion of the use of energy from renewable sources (RED II Directive)*

Commission Implementing Regulation (EU) 2022/2448 of 13 December 2022 *on establishing operational guidance on the evidence for demonstrating compliance with the sustainability criteria for forest biomass laid down in Article 29 of Directive (EU) 2018/2001 of the European Parliament and of the Council (IR 2022/2448)*

Commission Implementing Regulation (EU) 2022/996 of 14 June 2022 *on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria apply and its annexes (IR 2022/996)*

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 *on waste and repealing certain Directives*

3. Terms and Definitions

3.1 General

The following definitions laid down in Article 2 of RED II, Article 2 of the *Commission Implementing Regulation (EU) on establishing operational guidance on the evidence for demonstrating compliance with the sustainability criteria for forest biomass* (hereinafter IR 2022/2448), and Article 2 of the *Commission Implementing Regulation (EU) on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria* (hereinafter IR 2022/996) are applicable for the implementation of this ST 5002.

3.1.1 Actual value

The greenhouse gas emissions savings for some or all of the steps of a specific biofuel, bioliquid or biomass fuel production process, calculated in accordance with the methodology laid down in Part C of Annex V or Part B of Annex VI of RED II.

3.1.2 Agricultural biomass

Biomass produced from agriculture.

3.1.3 Biomass

The biodegradable fraction of products, **waste**, and **residues** from biological origin from agriculture, including vegetal and animal substances, from forestry and related industries, including fisheries and aquaculture, as well as the biodegradable fraction of **waste**, including industrial and municipal **waste** of biological origin.

3.1.4 Biomass fuels

Gaseous and solid fuels produced from **biomass**.

3.1.5 Carbon pool

The whole or part of a biogeochemical feature or system within the territory of a Member State and within which carbon, any precursor to a greenhouse gas containing carbon, or any greenhouse gas containing carbon is stored.

3.1.6 Carbon stock

The mass of carbon stored in a **carbon pool**.

3.1.7 Carbon sink

Any process, activity or mechanism that removes a greenhouse gas, an aerosol, or a precursor to a greenhouse gas from the atmosphere

3.1.8 Certification audit (or initial audit)

An initial audit before participation in a scheme, with the purpose of issuing a certificate under a **voluntary scheme**.

3.1.9 Certification body

A certification body is an independent accredited or recognised conformity assessment body that concludes an agreement with a **voluntary scheme** to provide certification services for raw materials or fuels by carrying out audits of **economic operators** and issuing certificates on behalf of the **voluntary schemes** using the voluntary scheme's certification system.

Note: Certification bodies shall sign a PEFC RED II notification contract with PEFC. A certification body holding a valid PEFC RED II notification contract is referred to as a PEFC RED II notified certification body.

3.1.10 Country of harvest

The country or territory where the forest biomass raw material was harvested.

3.1.11 Critical nonconformity

The intentional violation of a voluntary scheme's standards such as fraud, irreversible **nonconformity**, or a violation that jeopardies the integrity of the **voluntary scheme**. Critical nonconformities shall include, but are not limited to, the following:

- a) Non-compliance with a mandatory requirement of RED II, such as land conversion which contravenes Article 29(3), (4) and (5) of that Directive.
- b) Fraudulent issuance of a proof of sustainability or self-declarations, for example, intentional duplication of a proof of sustainability to seek financial benefit.
- c) Deliberate misstatement of raw material description, falsification of greenhouse gas (GHG) values or input data as well as the deliberate production of **wastes** or **residues**, for example, the deliberate modification of a production process to produce additional residue material, or the deliberate contamination of a material with the intention of classifying it as a **waste**.

3.1.12 Deadwood

All non-living woody **biomass** not contained in the litter, either standing, lying on the ground, or in the soil, including wood lying on the surface, coarse debris, dead **roots**, and **stumps** larger than or equal to 10 cm in diameter or any other diameter used by the country concerned.

3.1.13 Default value

A value derived from a **typical value** by the application of pre-determined factors and that may, in circumstances specified in RED II, be used in place of an **actual value**.

3.1.14 Economic operator/Organisation

A producer of raw material, a collector of **waste** and **residues**, an operator of **installations** processing raw material into final fuels or intermediate products, an operator of **installations** producing energy (electricity, heating or cooling) or any other operator, including of storage facilities or traders that are in physical possession of raw material or fuels, provided that they process information on the **sustainability and GHG emissions saving characteristics** of those raw materials or fuels.

Note 1: The term "economic operator" is equivalent to the term "organisation" used in PEFC ST 2002.

Note 2: An organisation that holds a valid PEFC **RED II certificate** issued under the PEFC RED II certification scheme is called a PEFC RED II certified organisation.

3.1.15 Expired certificate

A certificate that is no longer valid.

3.1.16 First gathering point

A storage or processing facility managed directly by an **economic operator** or other counterpart under contractual agreement that is sourcing raw material directly from producers of **agricultural biomass**, **forest biomass**, **wastes** and **residues** or, in the case of renewable fuels of non-biological origin, the plant producing such fuels.

Note 1: The first gathering point for **waste** and **residues** is the collection point. A collection point is a storage or processing facility managed directly by an **economic operator** that is sourcing **ligno-cellulosic material** from **wastes** and **residues**.

Note 2: Within the scope of PEFC ST 5002, the first gathering point only covers **organisations** sourcing raw material directly from producers of **forest biomass** and **waste** and **residues** from **ligno-cellulosic material**.

3.1.17 First party auditing

A self-declaration by an **economic operator** supplying to the **first gathering point**.

3.1.18 Forest biomass

Biomass produced from forestry.

Note: Forest biomass includes **forestry residues**.

3.1.19 Forest regeneration

Re-establishment of a forest stand by natural or artificial means following the removal of the previous stand by felling or as a result of natural causes, including fire or storm.

3.1.20 Forestry residues

Residues that are directly generated by forestry and that do not include **residues** from related industries or processing.

3.1.21 Harvesting criteria at national or sub-national level

The criteria laid down in point (a) of Article 29(6) of RED II:

- a) the country in which **forest biomass** was harvested has national or sub-national laws applicable in the area of harvest as well as monitoring and enforcement systems in place ensuring:
 - i. the legality of harvesting operations;
 - ii. **forest regeneration** of harvested areas;
 - iii. that areas designated by international or national law or by the relevant competent authority for nature protection purposes, including in wetlands and peatlands, are protected;
 - iv. that harvesting is carried out considering maintenance of soil quality and biodiversity with the aim of minimising negative impacts; and
 - v. that harvesting maintains or improves the **long-term production capacity** of the forest;

3.1.22 Harvesting criteria at sourcing area level

The criteria laid down in point (b) of Article 29(6) of RED II:

- b) when evidence referred to in point (a) of the previous definition is not available, the biofuels, bioliquids and biomass fuels produced from **forest biomass** shall be taken into account for the purposes referred to in points (a), (b) and (c) of the first subparagraph of paragraph 1 of Article 29 RED II if management systems are in place at forest sourcing area level ensuring:
 - i. the legality of harvesting operations;
 - ii. **forest regeneration** of harvested areas;
 - iii. that areas designated by international or national law or by the relevant competent authority for nature protection purposes, including in wetlands and peatlands, are protected unless evidence is provided that the harvesting of that raw material does not interfere with those nature protection purposes;
 - iv. that harvesting is carried out considering the maintenance of soil quality and biodiversity with the aim of minimising negative impacts; and
 - v. that harvesting maintains or improves the **long-term production capacity** of the forest.

3.1.23 Installation

A production unit of electricity, heating or cooling. An installation shall be considered to be in operation once the physical production of biofuels, biogas consumed in the transport sector, and bioliquids, and the physical production of heating and cooling and electricity from **biomass fuels** has started.

3.1.24 Legal predecessor

An **economic operator** that has been legally replaced by a new one, but no substantive changes or only superficial ones have been made regarding its ownership, management composition, working methods or scope of activity.

3.1.25 Level A

Evidence that the **country of harvest**, and, where applicable, the sub-national region where the **forest biomass** was harvested, has applicable legislation and regulation to the area of harvest in place and the existence of systems for ensuring monitoring of implementation and enforcement of the national and sub-national legislation and regulation. Additionally, Level A evidence also means that the country complies with the land use, land-use change and forestry (LULUCF) criteria at country level.

3.1.26 Level B

Evidence demonstrating compliance with the **RED II sustainability criteria** at the forest sourcing area level.

Note: Level B evidence is applied where the **Level A** evidence does not exist for a specific country or for specific **RED II sustainability criteria**.

3.1.27 Ligno-cellulosic material

Material composed of lignin, cellulose, and hemicellulose, such as **biomass** sourced from forests, woody energy crops and forest-based industries' **residues** and **wastes**.

3.1.28 Long-term production capacity

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.

3.1.29 LULUCF criteria at national level

The criteria laid down in point (a) of Article 29(7) of RED II:

- a) The country or regional economic integration organisation of origin of the **forest biomass**:
 - i. Is a Party to the Paris Agreement.
 - ii. Has submitted a nationally determined contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC), covering emissions and removals from agriculture, forestry and land use which ensures that changes in **carbon stock** associated with biomass harvest are accounted towards the country's commitment to reduce or limit GHG emissions as specified in the NDC; or
 - iii. Has national or sub-national laws in place, in accordance with Article 5 of the Paris Agreement, applicable in the area of harvest, to conserve and enhance **carbon stocks** and **sinks**, and providing evidence that reported LULUCF-sector emissions do not exceed removals.

3.1.30 LULUCF criteria at sourcing area level

The criteria laid down in point (b) of Article 29(7) of RED II:

- b) Where evidence referred to in point (a)...[of the previous definition] is not available, the biofuels, bioliquids and **biomass fuels** produced from **forest biomass** shall be taken into account for the purposes referred to in points (a), (b) and (c) of the first subparagraph of paragraph 1 of Article 29 of RED II if management systems are in place at forest sourcing area level to ensure that carbon stocks and sinks levels in the forest are maintained, or strengthened over the long term.

3.1.31 Major nonconformity

Failure to comply with a mandatory requirement of RED II and a **voluntary scheme**, where the **nonconformity** is potentially reversible, repeated and reveals systematic problems, or aspects that alone, or in combination with further **nonconformities**, may result in a fundamental system failure.

3.1.32 Management system for sourcing area

Information collected on the forest area at the sourcing area level, including in the form of text, maps, tables and graphs, and strategies or management activities planned and implemented to reach the forest resource management or development goals.

Note: The information collected at the sourcing area level feeds the organisation's management system: a set of interrelated or interacting elements of an **organisation** to establish policies and objectives and processes to achieve those objectives. The term 'management system' means an information management system run by an **economic operator** to demonstrate that biomass sourcing is in compliance with the sustainability criteria at forest sourcing area level defined in Articles 29(6)(b) and 29(7)(b). The management system has to document management practices with relevance to the sustainability criteria (as further described in this standard) that have been and are planned to be applied by forest managers/owners in the **sourcing area**. The management system is not to be confused with a forest management system, as in most cases, the **economic operator** will have no legal power or mandate to manage the forests where it sources the **biomass** from. The management system ensures that information necessary to demonstrate compliance with all sustainability criteria through a risk-based approach is collected, verified, assessed,

securely stored by the **economic operator**, and appropriately passed down the supply chain using a mass balance chain of custody. The system needs to be accurate, reliable, and protected against fraud, including verification ensuring that materials are not intentionally modified or discarded so that consignments or part thereof could become a **waste** or **residue** (RED II Article 30(3)). (Source: RED II BIO, 2.2.2 and 2.2.3).

3.1.33 Mass balance system

The mass balance system described in Article 30(1) of RED II describes a system in which the RED II “sustainability characteristics” remain assigned to “physical supplies”. This means that at each step in the supply chain, material with different RED II sustainability characteristics can be physically mixed, as long as the material sold has the same RED II sustainability characteristics overall as the material that was taken in, i.e., units in = units out (taking into account any conversion factors). RED II sustainability characteristics can be allocated in a flexible manner to material taken out of the mixture. The mass balance system:

- a) Allows consignments of raw material or fuels with differing **sustainability and GHG 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 GHG 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.

Note: The mass balance system is an additional and separate chain of custody method, specific for this ST 5002.

3.1.34 Minor nonconformity

A **nonconformity** that has a limited impact, constitutes an isolated or temporary lapse, is not systematic and does not result in a fundamental failure if not corrected.

3.1.35 Mix of raw material for the purpose of further processing

The physical mixing of raw material for the sole purpose of producing biofuels, bioliquids, or **biomass fuels**.

3.1.36 Natural disturbance

Any non-anthropogenic events or circumstances that cause significant emissions in forests and the occurrence of which is beyond the control of the relevant Member State, and the effects of which the Member State is objectively unable to significantly limit, even after their occurrence, on emissions.

3.1.37 Nonconformity

Non-compliance of an **organisation** or **certification body** with the rules and procedures, established by the **voluntary scheme** of which they are members or under which they operate.

3.1.38 PEFC authorised body

An entity authorised by the PEFC Council to perform the administration of the PEFC scheme on behalf of the PEFC Council.

Note: The authorised body is either the **PEFC National Governing Body** (PEFC NGB) operating within its country or another entity that has been authorised by the PEFC Council to perform the administration of the PEFC scheme.

3.1.39 PEFC National Governing Bodies (PEFC NGBs)

The PEFC NGBs are independent, national organisations established to develop and implement a PEFC system within their country. A list of the PEFC NGBs and their contact details can be found on the [PEFC website](#).

3.1.40 Plantation forest

A **planted forest** that is intensively managed and meets, at planting and stand maturity, all the following criteria: one or two species, even age class, and regular spacing. It includes short rotation plantations for wood, fibre and energy, and excludes forests planted for protection or ecosystem restoration, as well as forests established through planting or seeding which at stand maturity resemble or will resemble naturally regenerating forests.

3.1.41 Planted forest

Forest predominantly composed of trees established through planting and/or deliberate seeding provided that the planted or seeded trees are expected to constitute more than fifty percent of the growing stock at maturity; it includes coppice from trees that were originally planted or seeded.

3.1.42 Re-certification audit

An audit with the purpose of renewing a certificate issued by a **certification body** within the framework of a **voluntary scheme**.

3.1.43 Recognised national system

A national system recognised pursuant to Article 30(6) of RED II.

3.1.44 Recognised voluntary scheme

A **voluntary scheme** recognised pursuant to Article 30(4) of RED II:

*The Commission may decide that voluntary national or international schemes setting standards for the production of biofuels, bioliquids or **biomass fuels**, or other fuels that are eligible for counting towards the numerator referred to in point (b) of Article 27(1), provide accurate data on greenhouse gas emission savings for the purposes of Article 25(2) and Article 29(10), demonstrate compliance with Article 27(3) and Article 28(2) and (4), or demonstrate that consignments of biofuels, bioliquids or **biomass fuels** comply with the sustainability criteria laid down in Article 29(2) to (7). When demonstrating that the criteria laid down in Article 29(6) and (7) are met, the operators may provide the required evidence directly at sourcing area level. The Commission may recognise areas for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements or included in lists drawn up by intergovernmental organisations or the International Union for the Conservation of Nature for the purposes of point (c)(ii) of the first subparagraph of Article 29(3).*

*The Commission may decide that those 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, and for certification of biofuels, bioliquids and **biomass fuels** with low indirect land-use change-risk.*

Note: The set of technical documents (the PEFC ST 5000 series (ST 5002, 5003, and 5004) and the additional *TD PEFC compliance with RED II requirement at scheme owner level*) that PEFC developed to be recognised as **voluntary scheme** by the European Commission comprise the PEFC RED II certification scheme.

3.1.45 RED II certificate

A conformity statement by a **certification body** within the framework of a **voluntary scheme**, certifying that an **economic operator** complies with the requirements of RED II.

Note: A conformity statement by a **certification body** within the framework of the PEFC **voluntary scheme** recognised by the European Commission under the RED II, certifying that an **economic operator** complies with the requirements of RED II is called a PEFC RED II certificate. An **organisation** holding a valid PEFC RED II certificate is referred to as a PEFC RED II certified **organisation**.

3.1.46 RED II product group

Raw materials, biofuels, bioliquids, non-gaseous **biomass fuels** with similar physical and chemical characteristics and similar heating values or gaseous **biomass fuels**, and LNG with similar chemical characteristics that all are subject to the same rules set out in Articles 7, 26 and 27 of RED II for determining the contribution of biofuels, bioliquids and **biomass fuels** towards achieving the targets for renewable energy.

Note: LNG stands for liquefied natural gas.

3.1.47 RED II sustainability criteria

RED II sustainability criteria are set in Article 29(2) to (7) of RED II. The applicable RED II sustainability criteria for biofuels, bioliquids and **biomass fuels** produced from **forest biomass** are set in Article 29(6) and (7). They are split into RED II sustainability criteria at harvesting level, and RED II sustainability criteria for maintenance or strengthening of carbon stock and sink levels.

At harvesting level, RED II sustainability criteria can be summarised as:

- a) the legality of harvesting operations
- b) **forest regeneration** of harvested areas
- c) areas designated by international or national law or by the relevant competent authority for nature protection purposes, including in wetlands and peatlands, are protected
- d) areas where harvesting is carried out considering maintenance of soil quality and biodiversity with the aim of minimising negative impacts; and
- e) areas where harvesting maintains or improves the **long-term production capacity** of the forest

At carbon stock and sink level maintenance, RED II sustainability criteria can be summarised as:

- a) The country or regional economic integration organisation of origin of the **forest biomass**:
 - i. Is a Party to the Paris Agreement;
 - ii. Has submitted a nationally determined contribution (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC), covering emissions and removals from agriculture, forestry and land use which ensures that changes in **carbon stock** associated with biomass harvest are accounted towards the country's commitment to reduce or limit greenhouse gas emissions as specified in the NDC; or
 - iii. Has national or sub-national laws in place, in accordance with Article 5 of the Paris Agreement, applicable in the area of harvest, to conserve and enhance **carbon stocks** and **sinks**, and providing evidence that reported LULUCF-sector emissions do not exceed removals.

- b) where evidence referred to in point (a) of this paragraph is not available, the biofuels, bioliquids and **biomass fuels** produced from **forest biomass** shall be taken into account for the purposes referred to in points (a), (b) and (c) of the first subparagraph of paragraph 1 of Article 29 of RED II if management systems are in place at forest certified area level to ensure that carbon stocks and sinks levels in the forest are maintained, or strengthened over the long term.

Note: The articles from RED II mentioned in this definition include more information. They also specify how these criteria can be implemented by **organisations**. For the purposes of PEFC ST 5002, we have summarised it. For further details, go directly to RED II.

3.1.48 Residue

A substance that is not the end product(s) that a production process directly seeks to produce; it is not a primary aim of the production process, and the process has not been deliberately modified to produce it.

3.1.49 Second party auditing

The auditing of a supplier by the **economic operator** managing the **first gathering point**. Second party auditing processes are also covered during the third party audits of the first gathering point.

Example of second party audit: the assessment of additional evidence that a supplier of forest biomass may provide to the first gathering point to show compliance with the **RED II sustainability criteria**.

3.1.50 Site

A geographical location, logistical facilities, transmission, or distribution infrastructures with precise boundaries within which products can be mixed.

Note: Organisational units located in distinct physical sites can be considered part of a site if they are an extension without their own purchasing, processing, or sales functions (for instance, a remote storage facility). However, a single site cannot encompass more than one legal entity. Subcontractors used under outsourcing agreements (e.g., outsourced warehouses) are not categorised as sites.

3.1.51 Sourcing area

The geographically defined area from which the forest biomass feedstock is sourced, from which reliable and independent information is available and where conditions are sufficiently homogeneous to evaluate the risk of the sustainability and legality characteristics of the **forest biomass**.

Note: A sourcing area can comprise one or more PEFC SFM certified areas (certified area). A certified area is the forest area covered by a SFM system according to the PEFC SFM Standard (PEFC ST 1003). **Level B** evidence requirements, as per chapter 6, can be implemented at sourcing area, or at certified area.

3.1.52 Stumps and roots

Parts of the whole tree volume, excluding the volume of the above-stump woody **biomass**, considering the height of the stump as that at which the tree would be cut under normal felling practices in the relevant country or region.

3.1.53 Support scheme

Any instrument, scheme or mechanism applied by an EU Member State, or a group of EU Member States, that promotes the use of energy from renewable sources by reducing the cost of that energy, increasing the price at which it can be sold, or increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased, including but not restricted to, investment aid, tax exemptions or reductions, tax refunds, renewable energy obligation support schemes including those using green certificates, and direct price support schemes including feed-in tariffs and sliding or fixed premium payments.

3.1.54 Surveillance audit

Any follow up audit of certificates issued by a **certification body** within the framework of a **voluntary scheme** after certification and before a **re-certification audit**, which can be carried out quarterly, half-annually or annually.

3.1.55 Suspended certificate

A certificate temporarily invalidated due to **nonconformities** identified by the **certification body** or upon voluntary request of the **economic operator**.

3.1.56 Sustainability and greenhouse gas (GHG) emissions saving characteristics

The set of information describing a consignment of raw material or fuel that is required for demonstrating compliance of that consignment with the sustainability and GHG emissions saving criteria for biofuels, bioliquids and **biomass fuels** or the GHG emission savings requirements applicable for renewable liquid and gaseous transport fuels of non-biological origin and recycled carbon fuels.

3.1.57 Terminated certificate

A certificate that has been voluntarily cancelled while it is still valid.

3.1.58 Third party auditing

The auditing of an **economic operator** carried out by a third party that is independent from the **organisation** subject to the auditing.

3.1.59 Typical value

An estimate of the greenhouse gas emissions and greenhouse gas emissions savings for a particular biofuel, bioliquid or biomass fuel production pathway, which is representative of the Union consumption.

3.1.60 Voluntary scheme

An **organisation** that certifies the compliance of **economic operators** with criteria and rules including, but not limited to, the sustainability and GHG saving criteria set out in RED II and in Delegated Regulation (EU) 2019/807 on *the determination of high ILUC-risk feedstock for which a significant expansion of the production area into land with high carbon stock is observed, and the certification of low ILUC-risk biofuels, bioliquids and biomass fuels*.

3.1.61 Waste

Waste means any substance or object which the holder discards or intends or is required to discard as defined in Article 3(1) of Directive 2008/98/EC on waste, excluding substances that have been intentionally modified or contaminated in order to meet this definition.

3.1.62 Withdrawn certificate

A certificate that has been permanently cancelled by the **certification body** or the **voluntary scheme**.

4. Requirements for the implementation of a mass balance system

4.1 General

4.1.1 To use the PEFC scheme to demonstrate compliance with RED II requirements, the **organisation** shall hold a valid PEFC recognised chain of custody certificate, and a valid PEFC **RED II certificate**.

4.1.2 The **organisation** shall cooperate with the European Commission and the competent authorities of the EU Member States, including granting access to the European Commission and the competent authorities of the EU Member States when requested, as well as making available to the European Commission and the competent authorities of the EU Member States, all information needed to fulfil their tasks under RED II.

Note: For **organisations** acting as **first gathering points** for **forest biomass**, they shall ensure that their suppliers of **forest biomass** comply with this requirement.

4.1.3 The **organisation** shall sign a PEFC RED II certification contract with the PEFC Council, or the **PEFC authorised body** from the country where they are based, prior to obtaining the PEFC **RED II certificate**.

4.1.4 In the context of RED II certification, PEFC does not allow multisite or group certification. **Organisations** with multisite or group PEFC chain of custody certification shall obtain an individual PEFC **RED II certificate** for each individual **site** or participant concerned and maintain separated RED II balance system accounts.

Note: A **site** refers to a singular operational entity of an **organisation** located at a specific physical **site**, separate from other units within the same **organisation**. Organisational units located in distinct physical **sites** can be considered part of a **site** if they are an extension without their own purchasing, processing, or sales functions (for instance, a remote storage facility). However, a single **site** cannot encompass more than one legal entity. Subcontractors used under outsourcing agreements (e.g., outsourced warehouses) are not categorised as **sites**. Examples of typical **sites** include processing or trading facilities like manufacturing **sites**, sales offices, or company-owned warehouses.

4.1.5 The **first gathering point** is the first **organisation** within the supply chain that shall get certified against this PEFC ST 5002 and the first that shall provide a RED II Declaration to their client **organisations** to demonstrate that the material supplied is RED II compliant.

Note: Appendix 1 of PEFC ST 5002 includes a template for RED II Declarations.

4.1.6 **Forest biomass** shall comply with the **RED II sustainability criteria**.

4.1.7 For any sourced **forest biomass** or **ligno-cellulosic material** from forest-related industry **residues** and **waste** to be RED II compliant, the **organisation** shall comply with RED II GHG emissions calculations requirements (as per chapter 7) from the process of collection, if the first renewable energy production date is after 1 January 2021 in the **installation**. Table 1 and 2 summarise the applicable RED II GHG emissions calculations requirements, depending on the type of material and the first date of production of renewable energy in the **installation**.

Table 1: Where the first production date of renewable energy in a PEFC RED II certified installation is before 1 January 2021, the following requirements related to the GHG emissions calculations shall be met:

	DDS	Sustainability proof	GhG calculation up to the process of collection	GhG calculation from the process of collection
Forest biomass	Yes	Yes	No	No
Residues from processing and related industries, resulting from primary production processes	Yes	No	No	No
Residues from processing and related industries, products resulting from secondary production processes	No	No	No	No
Waste	No	No	No	No

Table 2: Where the first production date of renewable energy in the PEFC RED II certified installation is after 1 January 2021, the following requirements for the GHG emissions calculations shall be met:

	DDS	Sustainability proof	GhG calculation up to the process of collection	GhG calculation from the process of collection
Forest biomass	Yes	Yes	Yes	Yes
Residues from processing and related industries, resulting from primary production processes	Yes	No	No	Yes
Residues from processing and related industries, products resulting from secondary production processes	No	No	No	Yes
Waste	No	No	No	Yes

4.2 Management system

- 4.2.1** The **organisation** shall maintain an auditable system for safekeeping and reviewing all evidence related to the claims they make or rely on. The requirements in this PEFC ST 5002 shall be appropriately covered under the existing PEFC chain of custody management system.
- 4.2.2** The **organisation** shall define procedures, implement processes, and keep records on the material declared as RED II compliant and the applicable information that proves compliance, including conversion factors.
- 4.2.3** The **organisation** shall receive records of commercial transactions transmitted through the previous organisations within its supply chain to allow auditors to trace back through the supply chain to verify any RED II compliance claims made, as appropriate.
- 4.2.4** The **organisation** shall keep records and any evidence relating to RED II compliant declarations necessary to comply with the IR and RED II for a minimum of 5 years, or longer where it is required by the relevant national authority.
- 4.2.5** The **organisation** shall prepare and provide the **certification body** with any information relating to the auditing of such evidence.
- 4.2.6** The **organisation** shall provide to the auditor/s all mass balance data in advance of the planned audit, upon request by the **certification body**,

4.3 Implementation of the Due Diligence System

- 4.3.1** The **organisation** shall implement the PEFC Due Diligence System (PEFC DDS) on any **forest biomass** and **biomass fuels** used as input for a **RED II product group** for the avoidance of material from controversial sources. The **organisation** shall make sure that any material used as input for **RED II product groups** went through the PEFC DDS and resulted in “negligible risk” that it originates from controversial sources prior to enter the **mass balance system**.

Note 1: The PEFC DDS is described in Chapter 7 and Appendix 1 of PEFC ST 2002:2020, Chain of Custody of Forest and Tree Based Products.

Note 2: ‘Negligible risk’ is a level of risk that applies to forest and tree based materials, including **biomass** and **biomass fuels**, where, on the basis of a full assessment of material-specific and general information, and, where necessary, of the application of the appropriate mitigation measures (as specified in Chapter 7 and Appendix 1 of PEFC ST 2002:2020), those forest and tree based materials show no cause for concern as originating in controversial sources.

Note 3: Where the **organisation** procures material under a valid X% PEFC certified, 100% PEFC Origin or PEFC controlled sources claim from a supplier that holds a valid PEFC chain of custody certificate, or material that is declared as RED II compliant by a supplier with a valid PEFC **RED II certificate**, the risk can automatically be considered as negligible, provided that there are no substantiated concerns or complaints.

- 4.3.2** **Waste and residues** are excluded from the implementation of the PEFC DDS, except for **residues** from primary production processes, which shall go through the PEFC DDS and result in negligible risk prior to being classified as RED II compliant.

Note: Both PEFC ST 2002 as well as PEFC ST 5002 require the implementation of the PEFC DDS for **residues** resulting from primary production processes such as sawmilling **residues** (sawdust, chips, bark, etc.).

4.4 Identification of inputs and declaration of outputs

4.4.1 Identification of inputs at the first gathering point

4.4.1.1 The **organisation** acting as the **first gathering point** for **forest biomass** shall demonstrate that **forest biomass** entering the PEFC RED II **system** as input complies with the **RED II sustainability criteria**.

4.4.1.2 The **organisation** acting as the **first gathering point** for **forest biomass** shall demonstrate that **forest biomass** entering the PEFC RED II **system** as input complies with the **RED II sustainability criteria** using one of the following options:

- a) The **forest biomass** comes from an area for which there is a risk assessment at national or subnational level that is recognised by PEFC, this is known as **Level A** risk assessment.

Note: **Level A** risk assessments recognised by PEFC are published on the PEFC website.

- b) The **forest biomass** comes from an area for which there is a **Level A** risk assessment at national or subnational level conducted by **recognised voluntary schemes** or **recognised national systems** under the same scope as the PEFC system; or,

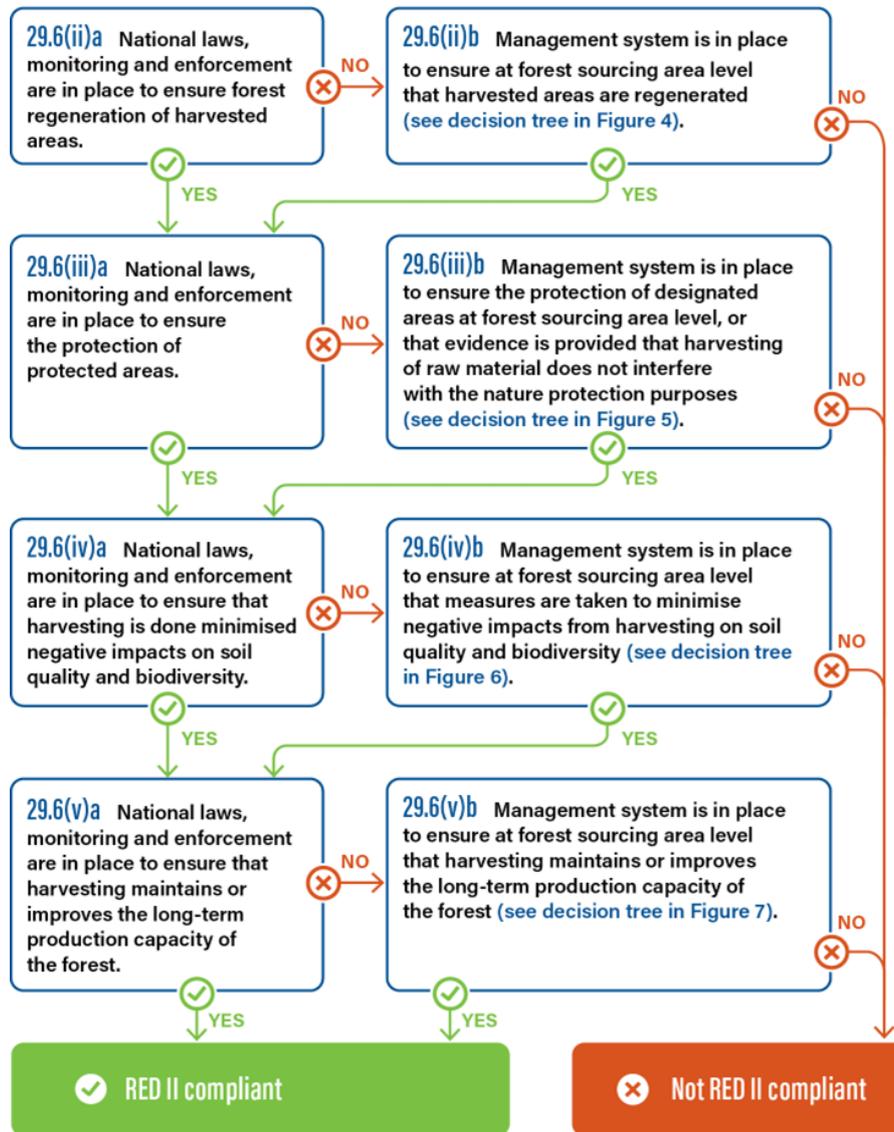
- c) Collecting and evaluating evidence of compliance of the **forest biomass** with **Level B** at sourcing area level.

4.4.1.3 If there is a **Level A** risk assessment in place covering the area from which the **forest biomass** is sourced, and the findings of the risk assessment show full compliance with the **RED II sustainability criteria**, the **organisation** acting as the **first gathering point** can accept the material as RED II compliant (after having implemented the PEFC DDS and resulted in negligible risk, as per 4.3).

4.4.1.4 The **organisation** acting as the **first gathering point** shall require the supplier of **forest biomass** to provide a self-declaration. The self-declaration shall include a statement that the **forest biomass** complies with the **RED II sustainability criteria** and include the country of origin.

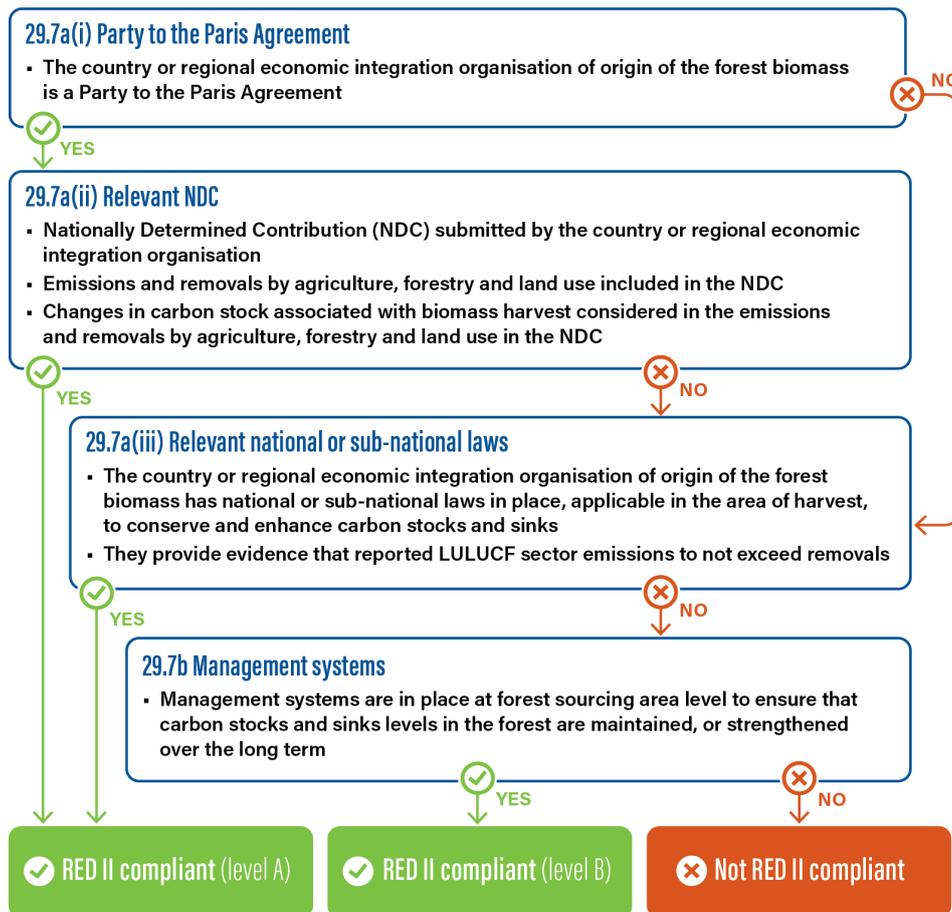
4.4.1.5 Where the **Level A** evidence on compliance criteria does not exist for all or some of the **RED II sustainability criteria**, the **organisation** acting as the **first gathering point** of **forest biomass** shall assess **Level B** evidence for compliance with the relevant **RED II sustainability criteria**. The requirements for **Level B** evidence are included in chapter 6.

Figure 1: Stepwise approach for demonstrating compliance with the harvesting criteria



Source: REDII BIO study, page 16

Figure 2: Stepwise approach to demonstrate compliance with the LULUCF criteria



Source: REDIBIO study, page 41

4.4.1.6 The **organisation** acting as the **first gathering point** shall require from the supplier of **forest biomass** a self-declaration that includes:

- Confirmation that the **forest biomass** is produced in a forest that is covered by a valid PEFC SFM certificate, if **Level B** is applies.
- Confirmation that the **forest biomass** is produced in an area that complies with the corresponding requirements of the RED II and chapter 6 of PEFC ST 5002, if **Level B** applies.
- A commitment to accept **second party audits** and **third party audits**, in case there is a substantiated concern or a suspicion that the **forest biomass** may not be compliant with the **RED II sustainability criteria**; and,
- A commitment to cooperate with the European Commission and the competent authorities of the EU Member States, including granting access to them when requested, as well as making available to the European Commission and the competent authorities of the EU Member States, all information needed to fulfil their tasks under RED II.

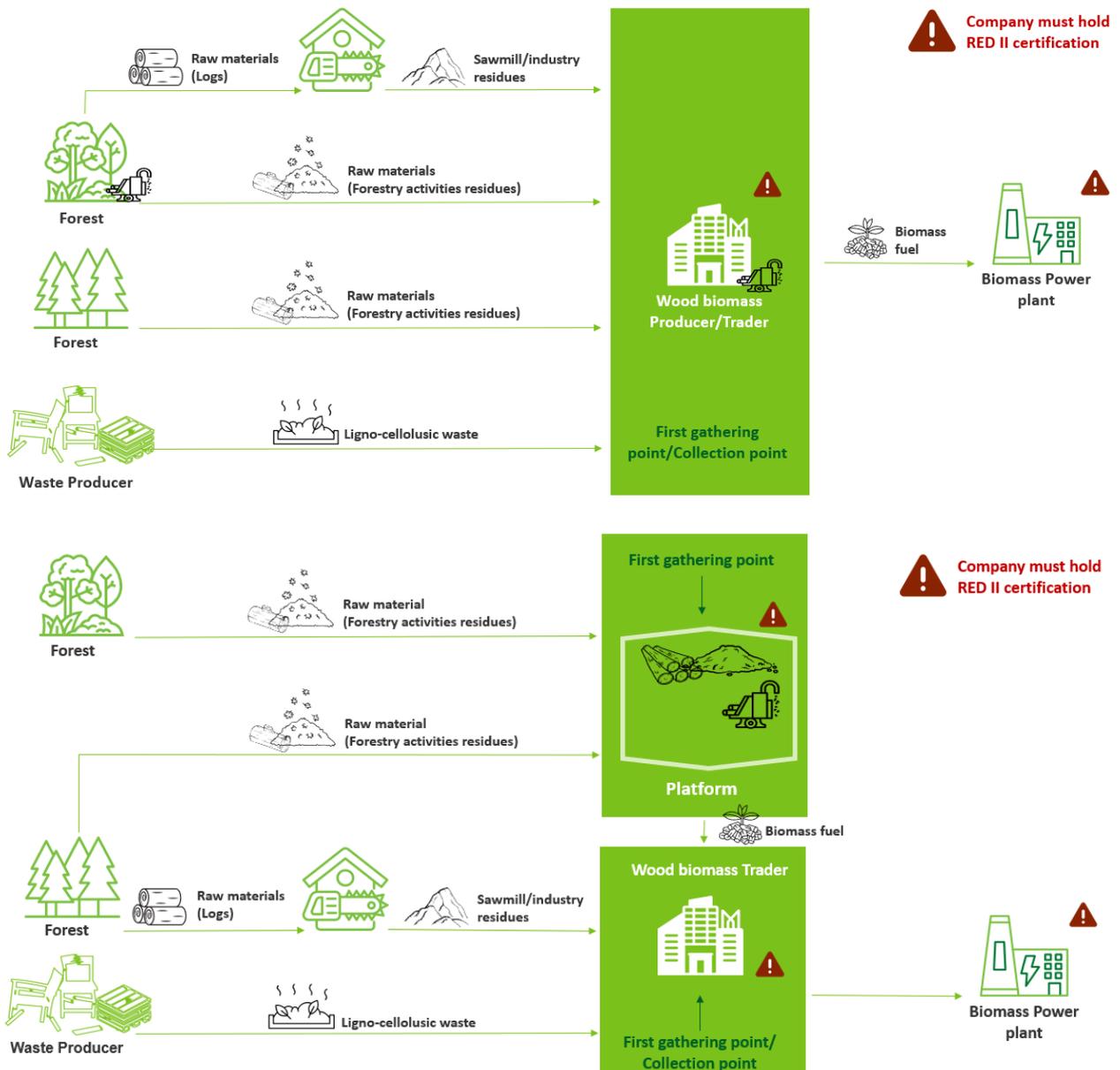
Note: In addition to this self-declaration, the **organisation** acting as the **first gathering point** needs to make sure to receive any other evidence and information from the supplier of **forest biomass** needed to assess compliance at **sourcing area** through **Level B**. The evidence required is outlined in chapter 6.

4.4.2 Identification of inputs at the collection point of waste and residues

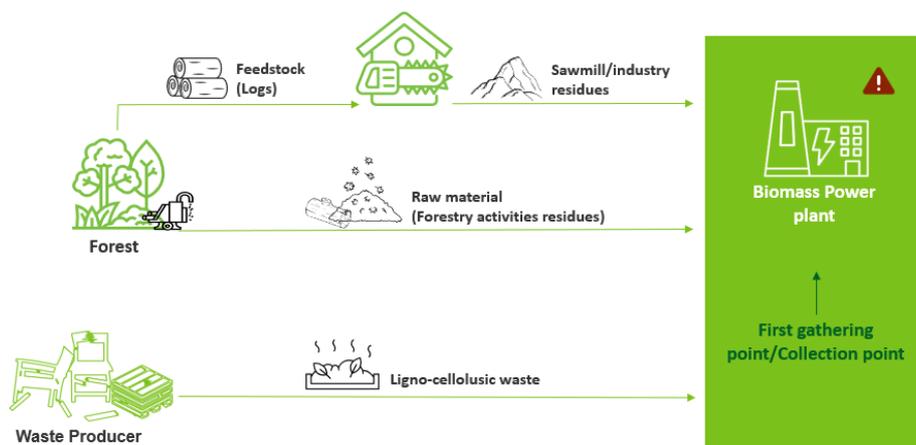
4.4.2.1 The collection point of **waste** and **residues** shall consider the **waste** and **residues** as RED II compliant provided that:

- The procured **waste** and/or **residue** is delivered by a producer of **waste** and/or **residues** that is meeting the requirements described in chapter 5, and evidence of this by **first party auditing**; or,
- The procured **waste** and/or **residue** is delivered by a producer of the **waste** and/or **residue** that is certified by this scheme or another **recognised voluntary scheme** or a **recognised national system**.

Figure 3: Examples of an organisation acting as first gathering point, and input material that may be received.



 **Company must hold RED II certification**



Note : When a biomass power plant buys directly from biomass producers, it is the first gathering point.

4.4.3 Identification of inputs delivered under a valid declaration of compliance with the RED II sustainability criteria

4.4.3.1 The **organisation** can consider input material as RED II compliant when it is delivered under a valid RED II compliant declaration by a supplier with:

- a valid PEFC **RED II certificate** stating conformity with PEFC ST 5002
- a valid PEFC **RED II certificate** stating conformity with another **recognised voluntary scheme**
- a document stating conformity with a **recognised national system**.

Note: **Recognised voluntary schemes** and **recognised national systems** can be checked on the European Commission's [webpage](#).

4.4.3.2 When implementing 4.4.3.1.a), the **organisation** shall verify on the PEFC website that the PEFC RED II certified supplier passing on a RED II Declaration holds a valid PEFC recognised chain of custody certificate that includes PEFC ST 5002 under its scope.

4.4.3.3 If material is certified against another **recognised voluntary scheme** or **recognised national system** (4.4.3.1.b or c), the **organisation** shall also verify the validity of the certificate of the supplier and the applicable declaration. If the material has been certified as **waste** and/or **residue** according to the requirements of the **recognised voluntary scheme** or **recognised national system**, this information shall be made clear.

4.4.4 Information requirements in order to accept input material under a RED II product group as RED II compliant

4.4.4.1 For each delivery of material to be used as input for a **RED II product group**, the **organisation** shall obtain from the supplier a declaration that includes all the relevant information to prove the compliance of the procured material with the RED II sustainability and GHG criteria (RED II sustainability characteristics), as applicable:

- the organisation's name as the customer (buyer) of the delivery
- supplier identification
- name of the **recognised voluntary scheme** or **recognised national scheme**
- proof of sustainability number (RED II related certificate code)
- type of **biomass** or **biomass fuels**, including **waste** and **residues**

- f) quantity of products (if biomass volume, stating clearly in what units and on what basis, e.g., moisture content)
- g) identification of date of delivery, delivery period, or accounting period
- h) country of origin of the raw material (this is the country in which the original material, **residue** or **waste** is harvested or produced, not where e.g., pellets or briquettes are produced)
- i) country of fuel production
- j) declaration from the supplier that the raw material, intermediary product, or fuel complies with the sustainability requirements in Article 29(6) to (7) of RED II, e.g.: a valid RED II compliant declaration or claim
- k) accurate data on all relevant elements of the GHG emissions calculations, as per chapter 7
- l) information on whether support has been provided for the production of that consignment, and if so, the type of support.

4.4.5 Information to be provided for output material which is declared as RED II compliant

4.4.5.1 When delivering material as RED II compliant under the PEFC scheme, the **organisation** shall provide their RED II certified clients with a declaration that includes all the information that the RED II certified client may need for the implementation of their RED II certification, including as a minimum:

- a) identification of the client **organisation** receiving the material
- b) identification of the **organisation** as the RED II supplier
- c) description of the physical product
- d) volume of RED II compliant output product
- e) RED II sustainability characteristics, as applicable
- f) date when the declaration is made.

Note: A template for the declaration of RED II compliance can be found in Appendix 1.

4.4.5.2 Each transfer of RED II sustainability characteristics shall be accompanied by a physical transfer of material.

4.5 Mass balance system

4.5.1 General

4.5.1.1 The **mass balance system** is the specific chain of custody method that **organisations** certified against PEFC ST 5002 shall use to track RED II compliant input material and make RED II compliant declarations for output material under the PEFC scheme.

Note: The **mass balance system** does not need to be integrated into the existing chain of custody methods. It can be implemented separately. However, the **organisation** may decide to integrate it into their existing chain of custody methods. In that case, they need to make sure that they comply with the requirements of PEFC ST 5002.

4.5.1.2 The **organisation** shall operate the **mass balance system** at a level where different supplies of **forest biomass** and/or **ligno-cellulosic material** from **residues** and **wastes** could normally be in contact, such as in a container, processing or logistical facility, infrastructure or **site** (defined as a geographical location with precise boundaries within which products can be mixed).

4.5.1.3 The **organisation** shall implement the **mass balance system** and track their inputs and outputs individually at each physical **site** they operate.

Note: The **mass balance system** does not allow cross-site product groups or mass balance accounts.

4.5.1.4 If more than one legal entity operates on a **site**, each legal entity shall operate its own **mass balance system**.

4.5.1.5 The **organisation** shall implement the **mass balance system** for specific **RED II product groups** of output material. An independent **mass balance system** shall be implemented for each product group.

4.5.1.6 The **organisation** shall only use the following material as input for a **RED II product group** that is RED II compliant:

- a) **Forest biomass** from an area covered by a **Level A** risk assessment that demonstrates full compliance with the **RED II sustainability criteria**. In addition, the material shall have gone through a PEFC DDS and resulted in negligible risk of coming from controversial sources.

Note: For material delivered under a valid X% PEFC certified, 100% PEFC Origin or PEFC controlled sources claim from a supplier that holds a valid PEFC chain of custody certificate, or material that is declared as RED II compliant by a supplier with a valid PEFC **RED II certificate**, the risk can automatically be considered as negligible, provided that there are not substantiated concerns or complaints. See 4.3.

- b) PEFC certified biomass material for which additional **Level B** evidence was provided from the supplier to demonstrate compliance with the **RED II sustainability criteria**. For that purpose, the producer of **forest biomass** shall hold a recognised PEFC SFM certificate. The **organisation** shall require the PEFC supplier to provide evidence as per the corresponding requirements under 6.2 and 6.3 of PEFC ST 5002 and commit to **second party auditing**.

Note: A recognised PEFC SFM certificate is a valid accredited forest management certificate issued by a PEFC notified **certification body** against a forest management system/standard that is endorsed by PEFC.

- c) **Forest biomass** supplied by an **organisation** holding a valid certificate from another **recognised voluntary scheme** or **recognised national system** with a valid RED II compliant claim from the corresponding scheme or system. In addition, the material shall have gone through a PEFC DDS and resulted in negligible risk of coming from controversial sources.

Note: For material delivered under a valid X% PEFC certified, 100% PEFC Origin or PEFC controlled sources claim from a supplier that holds a valid PEFC chain of custody certificate, or material that is declared as RED II compliant by a supplier with a valid PEFC **RED II certificate**, the risk can automatically be considered as negligible, provided that there are not substantiated concerns or complaints. See 4.3.

- d) **Ligno-cellulosic material** originating in forest-related industries.

Note: Both PEFC ST 2002 and PEFC ST 5002 require the implementation of the DDS for **residues** resulting from primary production processes such as sawmilling **residues** (sawdust, chips, bark, etc.). Thus, **residues** from primary production processes shall go through the DDS and result in negligible risk prior to being classified as RED II compliant. See also requirement 4.3.2.

- e) Ligno-cellulosic **wastes**

Note: For material delivered under a valid X% PEFC certified, 100% PEFC Origin or PEFC controlled sources claim from a supplier that holds a valid PEFC chain of custody certificate, or material that is declared as RED II compliant by a supplier with a valid PEFC **RED II certificate**, the risk can automatically be considered as negligible, provided that there are not substantiated concerns or complaints. See 4.3.

4.5.1.7 The **organisation** may establish **RED II product groups** for **forest biomass, ligno-cellulosic material** from **residues and waste**, or **biomass fuels** with differing RED II **sustainability and GHG emissions saving characteristics**, provided they have similar physical or chemical characteristics, heating values and/or conversion factors.

4.5.1.8 The **organisation** can establish **RED II product groups** for **forest biomass, ligno-cellulosic material** from **residues and waste**, or **biomass fuels** with differing energy content for the purposes of further processing, provided that the size of supplies is adjusted according to their energy content. This can be done as a weighted average.

Example: Supplies A: 1000 Tons of woodchips; energy content 4500Kwh/tons

Supplies B: 500 Tons of woodchips; energy content 6000Kwh/tons

OUTPUT*: 1500 Tons of woodchips; energy content 5000Kwh/tons

* Assumption of simple mixing, no transformation therefore no conversion factor

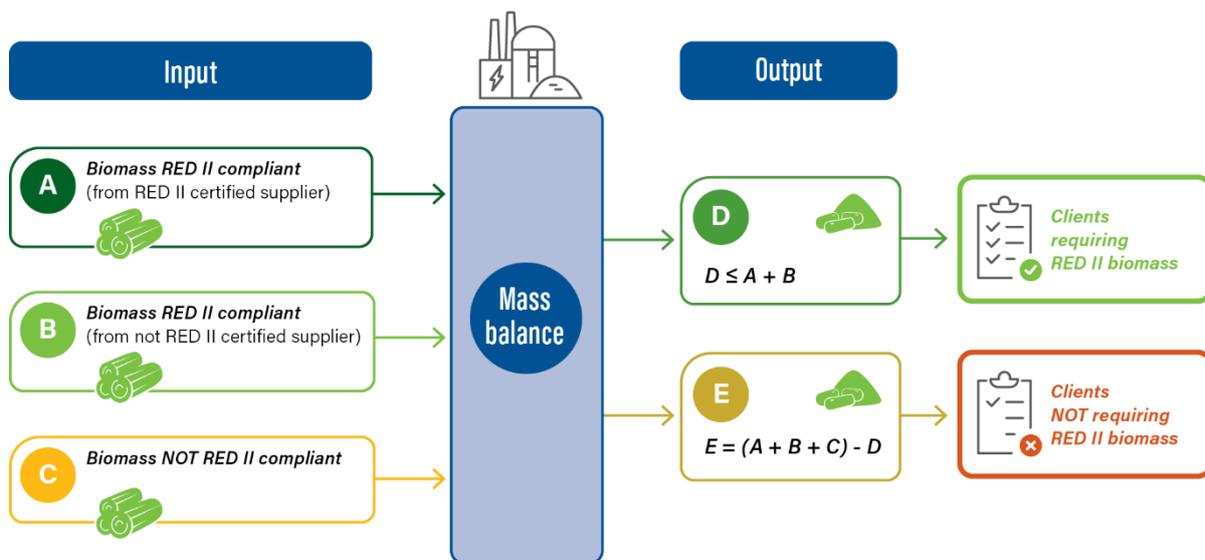
4.5.1.9 The **organisation** shall keep at **RED II product group** level information on RED II **sustainability and GHG emissions saving characteristics** and sizes of the supplies.

4.5.1.10 The amount of input material entering a **RED II product group** shall be equivalent to the amount of output material withdrawn from the **RED II product group** for the given mass balance timeframe. Equally, the RED II sustainability characteristics recorded for the input material entering a **RED II product group**, in the same quantities, shall be equivalent with the RED II sustainability characteristics declared for the output material, for the given mass balance timeframe.

Note 1: For RED II purposes, the amount of RED II compliant material accumulated shall correspond to the RED II compliant output material plus the amount of material in storage.

Note 2: If a supply of **forest biomass, ligno-cellulosic material** from **residues or waste**, or **biomass fuel** has already been taken into account in the calculation of the share of renewable energy, no further sustainability claims shall be issued for the supply.

Figure 4: Example of the RED II mass balance system



A: Biomass certified RED II & PEFC controlled sources or PEFC Certified

B: Biomass not RED II certified (but from an area covered by a risk analysis) & PEFC controlled sources or PEFC Certified

C: Biomass not RED II certified (from an area not covered by a risk analysis) & PEFC controlled sources or PEFC Certified

4.5.1.11 When **forest biomass, ligno-cellulosic material** from **residues or waste**, or **biomass fuel** is delivered to an **organisation** that is not participating in a **recognised voluntary scheme or recognised 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.

Example: Company “A” buys 1000 tons of *RED II compliant* forest chips wood which are then mixed on its platform. Company “A” then resells 400 tons of forest chips wood *RED II compliant* (RED II applicable) to a biomass heating plant and 500 tons to a chipboard factory (RED II not applicable). At the end of the mass balance timeframe, the quantity of *RED II compliance – PEFC* available in the mass balance and in the stock will be 100 tonnes.

4.5.1.12 Where a delivery of **biomass fuel** is used to comply with an obligation placed on a biomass fuel supplier by an EU Member State, the **organisation** shall withdraw the delivery from the mixture of the mass balance.

4.5.1.13 The **sustainability and GHG emissions saving characteristics** of a delivery of **forest biomass, ligno-cellulosic material** from **residues or waste**, or **biomass fuel** shall be considered as a set. Where deliveries 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.

4.5.1.14 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. See also 4.4.3.1.

4.5.1.15 For the **mass balance system** the **organisation** shall establish a timeframe of maximum 3 months. **Organisations** acting as the **first gathering point** sourcing only **forest biomass** may extend the timeframe up to 12 months.

Example: A company (e.g., pellet plant) sourcing both **forest biomass** (e.g., forest residues) and **residues** from wood processing, shall implement a mass balance schedule which does not exceed 3 months.

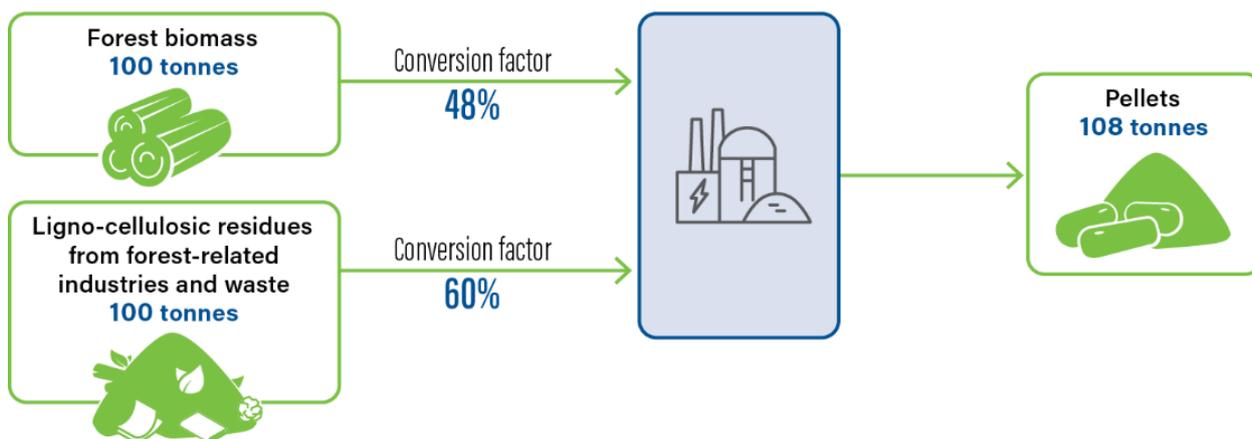
4.5.1.16 The start and end of the mass balance timeframe shall be aligned with the calendar year or, where applicable, the four quarters of the calendar year. As an alternative to the calendar year, **organisations** may also use the economic year that they use for bookkeeping purposes, provided that the choice is clearly indicated and applied consistently. At the end of the mass balance timeframe, 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**.

4.5.1.17 For an **organisation** undergoing initial RED II certification under the PEFC scheme, **forest biomass** received no more than 12 months before the **initial audit** can be considered as input material for the **RED II product group** in the **mass balance system**, and no more than 3 months for **ligno-cellulosic material** from **residues and waste**, provided that:

- a) the **forest biomass or the ligno-cellulosic material from waste and residues** was not processed
- b) conformity with the RED II sustainability characteristics and related requirements is fully documented, and
- c) if **residues or waste**, a self-declaration of the waste/residue producer was submitted, including all the information required under 5.2.3.

- 4.5.1.18** The application of the **mass balance system** to different types of **forest biomass, ligno-cellulosic material** from **residues or waste**, and/or fuels must not lead or risk to lead to a situation where the rules set out in Article 26 and 27 of the RED II that apply for determining the contribution of biofuels, bioliquids and **biomass fuels** towards the targets for renewable energy are not correctly applied or circumvented.
- 4.5.1.19** The **organisation** shall calculate conversion factors as the ratio of biomass input to biomass output after a conversion process or after natural leakage (e.g., during storage or transport).
- 4.5.1.20** Conversion factors shall be calculated based on the organisation's data and updated at least annually. The **organisation** shall keep records of the conversion factor(s), including:
- to which input product it refers
 - to which output product it refers
 - the units in which the conversion factor is expressed
 - the value of the actual conversion factor
 - dates when the specific conversion factor is valid; and
 - any calculations and supporting documentation that determines the conversion factor.

Figure 5: Example of conversion factor calculation of the mass of the input and the output



Note: The conversion factor is the remaining part of the input unit after the loss of the part that goes to losses during a transformation process. In this example it is indicated that with 100 tons of logs, we obtain 48 tons of pellets. This means that there were 52 tons of losses.

- 4.5.1.21** If supplies with different GHG values are combined, the **organisation** shall assign the highest GHG value to the combined output supply.

Figure 6: Example of the GHG value used for the combined output supply when supplies with different GHG value are combined

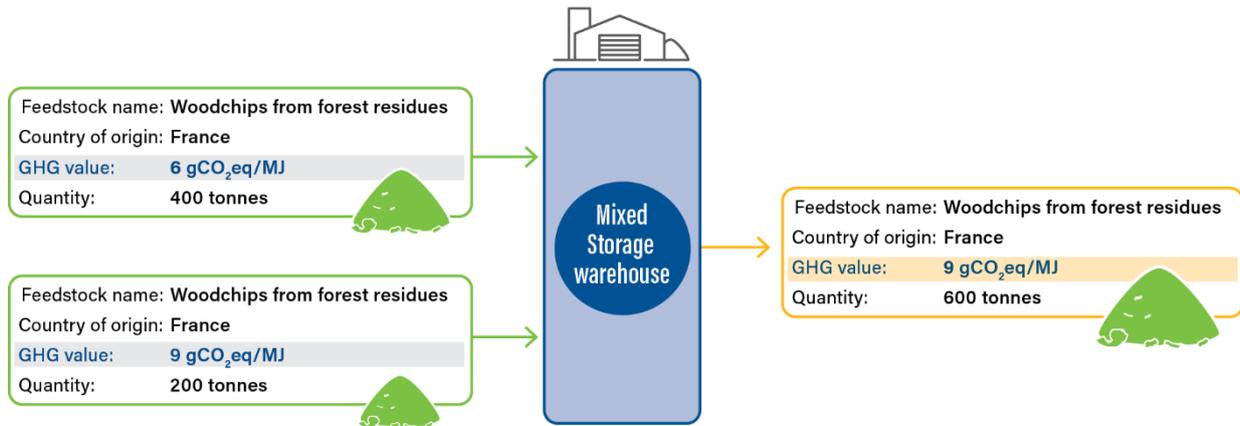
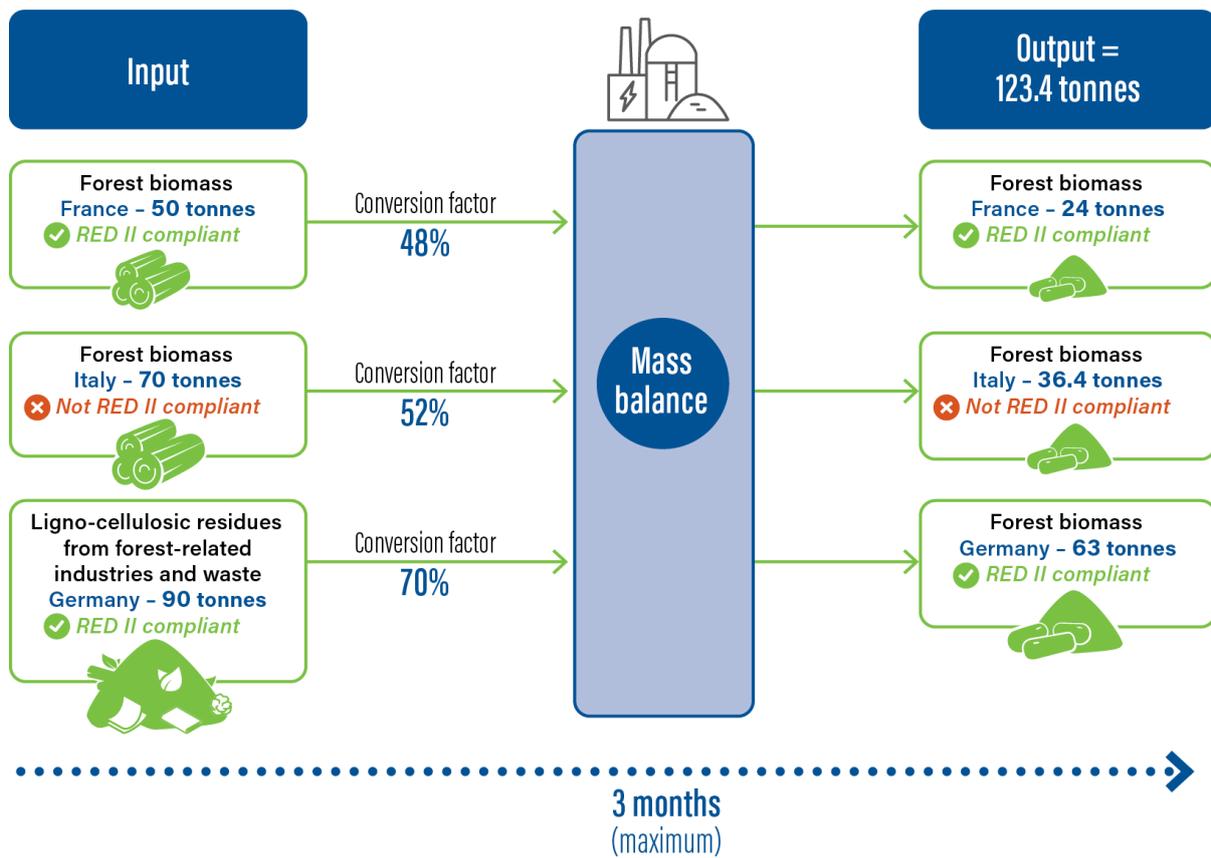


Figure 7: Example of an organisation's mass balance with the maximum timeframe when the input materials are mixed



4.6 Physical separation

4.6.1 General

4.6.1.1 When there is no mix of input material with different RED II sustainability characteristics, the **organisation** may implement physical separation.

Note: RED II sustainability characteristics are, e.g., the type of feedstock or biomass, the origin of the biomass, whether they are certified or not; or the GHG characteristics or values associated with the biomass.

4.6.1.2 The **organisation** shall ensure that different materials with varying sustainability and/or energy data shall be kept physically separate and identifiable.

Figure 8: Example of the physical separation method for materials with varying sustainability characteristics

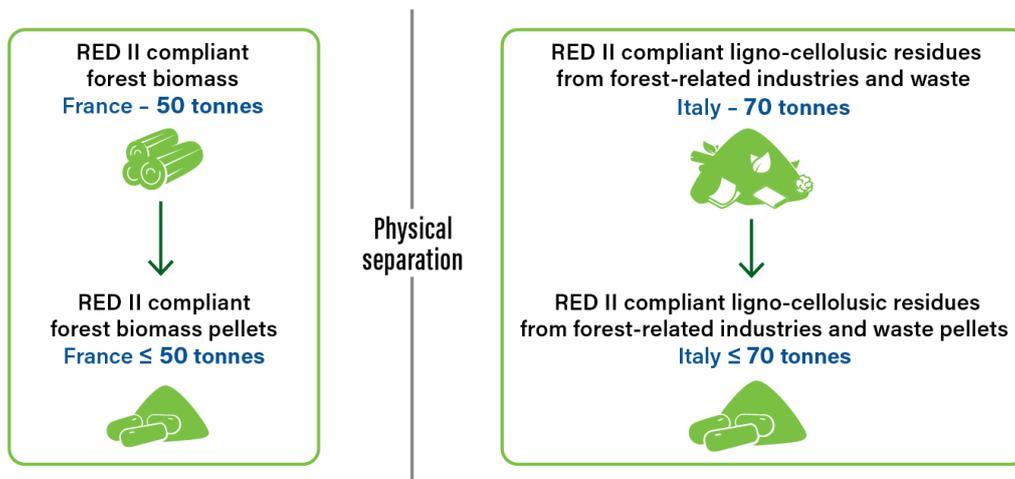
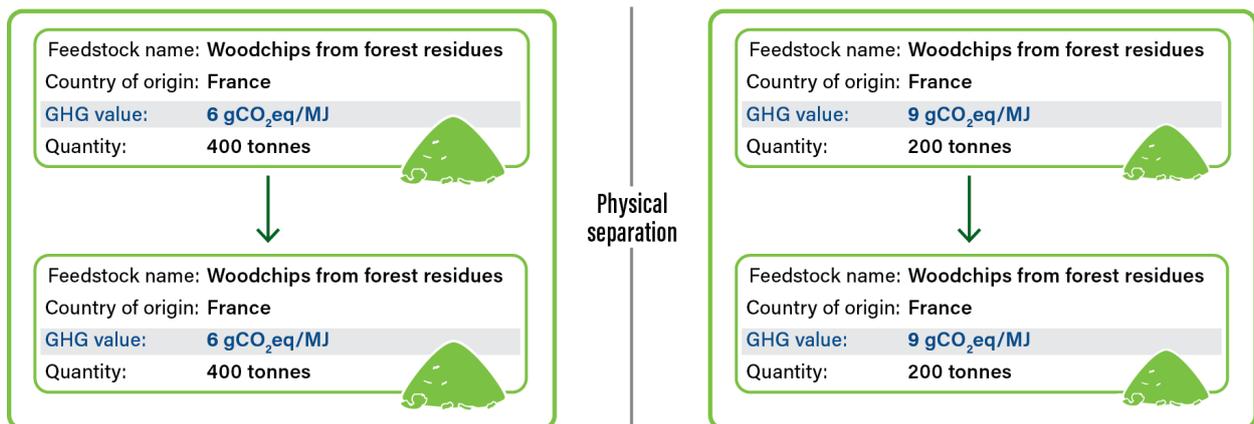


Figure 9: Example of the physical separation



5. Additional requirements for organisations supplying ligno-cellulosic material from residues and/or waste

5.1 General

5.1.1 The **organisation** that operates as the collection point of **waste** and **residues** shall:

- a) Automatically consider materials listed in Annex IV of the IR 2022/996 as the **waste** and **residues** regardless of their country of origin.
- b) For raw materials not listed in Annex IV of the IR 2022/996 and sourced in the EU, review legislation of the EU Member State in which the **raw material** has been generated and processed and apply relevant legislation to determine whether it is a **waste** or **residues**.
- c) In all other cases, determine the classification of the **raw material** (i.e., whether it meets the definition of **waste** and **residues**).
- d) Keep documented information for a minimum of 5 years, or longer where it is required by the relevant national authority, as evidence of the biomass compliance with the definition and requirements for the **waste** and **residues**.

Note 1: For the purposes of PEFC ST 5002 and Directive (EU) 2018/2001, **residues** that are directly generated by forestry are not considered as “**waste** and **residues**”. This **biomass** shall be treated as “**forest biomass**”.

Note 2: Concerning the **ligno-cellulosic material** covered by the scope of PEFC ST 5002, Annex IV of the IR considers as the **waste** and **residues** (see 5.1.1b) the following material: “damaged trees” and “recycled/waste wood”.

Note 3: Also, national legislation of a non-EU state can be applied for determinations of the **waste** and **residues** (see 5.1.1b) where the national legislation is aligned with the EU legislation.

5.1.2 The **biomass** shall not be considered as **waste** and **residues** where they, or the process for their production, have been deliberately modified for the purpose of declaring those materials as **wastes** and **residues**.

5.2 Management of the waste and residues supplies

5.2.1 The **organisation** that operates as the collection point of **waste** and **residues** shall conduct a group audit programme of the suppliers based on second party auditing of **waste** and **residues**, to verify the origin of the **waste** and **residues**, production volumes and compliance with the definitions and requirements for **waste** and **residues** defined in the Directive (EU) 2018/2001 and PEFC ST 5002.

5.2.2 The audit programme shall include, as a minimum:

- a) The establishment of a management system for the verification and monitoring of suppliers (producers) of **waste** and **residues** and supplies.
- b) Verification and processing of the waste and residues supplies.
- c) Conduction of audits of suppliers (producers) of **waste** and **residues**.

5.2.3 As part of the management system mentioned in 5.2.2, the **organisation** that operates as the collection point of **waste** and **residues** shall:

- a) Determine roles and responsibilities of any personnel involved in the management of the **waste** and **residues**, including the role of the certification manager within the audit programme, as well as determine and follow up on the key roles and responsibilities at supplier level.

- b) Set up procedures for monitoring the compliance of suppliers with RED II requirements, identifying any **nonconformities**, and implementing preventive and corrective actions, as appropriate.

Example: If the **organisation** that operates as the collection point of **waste** and **residues** identifies non-compliant **waste** or **residues**, the procedure shall allow the **organisation** to request to correct purchase documents, or to stop sourcing from the suppliers temporarily, until the problem is solved, or permanently.

- c) Define the evidence and implement the necessary actions and record keeping procedures that each supplier (producer) of **waste** and **residues** shall comply with to ensure that the **waste** and **residues** supplied comply with RED II requirements.
- d) Obtain from each supplier of **waste** and **residues**, and verify, the following information relating to the procured **waste** and **residues**:
 - i. name and address of the supplier
 - ii. type of supplier (e.g., producer of **waste**, producer of **residues** from primary processing industry, etc.)
 - iii. type of **biomass** supplied (e.g., sawdust, bark, etc.)
 - iv. volume of **waste** and **residues** generated monthly or annually
- e) Obtain from each supplier of **waste** and **residues** a self-declaration where the supplier commits to:
 - i. comply with any applicable RED II requirements
 - ii. deliver only **waste** and **residues** that meet the requirements and definitions of the Directive (EU) 2018/2001 and PEFC ST 5002
 - iii. implement any measures and procedures to allow the **organisation** acting as the collection point to conduct the second-party audit programme
 - iv. implement any preventive or corrective actions, as requested by the **organisation**
 - v. keep and provide access to production records relating to its production, including volumes of procured raw material, type and volume of produced products, type and volume of generated **waste** and **residues**, sales volumes for **waste** and **residues** or agreements for disposal of **wastes**; and
 - vi. retain documentary evidence that the **waste** and **residues** supplied comply with RED II requirement. Different types of evidence shall be retained for inspection by the **certification body**, including samples, pictures, quality analysis reports, invoices, delivery notes and/or shipping documents, depending on the feedstock concerned.
 - vii. accept to receive remote and, where necessary, on-site audits, to verify the compliance of the **waste** and **residues** with RED II requirements
- f) Define audit procedures, including suppliers' audit, covering both on-site and remote audits, and conditions when it is necessary to conduct on-site audits of suppliers to verify the compliance of **waste** and **residues** with RED II requirements. The frequency and intensity of the auditing procedure shall be based on a risk analysis that covers, at least:
 - i. type of **wastes** and **residues**
 - ii. processes in which the **wastes** and **residues** have been generated
 - iii. volume of generated **wastes** and **residues**
 - iv. uncertainty in classification of **biomass** as **wastes** and **residues**
 - v. risk of mixing of **waste** and **residues** with another type of **biomass**

- 5.2.4** As part of the verification and processing of **waste** and **residues**, the **organisation** that operates as the collection point of **waste** and **residues** shall:
- a) Conduct a visual inspection of every supplied **waste** and **residues** to verify information provided by the supplier.
 - b) Classify the **biomass** as either **waste** or **residues**.
 - c) Keep documented information (records) providing evidence of compliance with the requirements defined in 5.1.1, including where appropriate material samples, photos, quality analysis reports, invoices, delivery notes and/or shipping documents, etc.

Note: The requirements 5.2.4 a and c are not required for supplies of **waste** from private households.

5.2.5 In cases where adequate evidence for the classification of **waste** and **residues** is not available at the point of receipt (e.g., it is impossible to verify whether wood chips belong to primary or processing residues category), the **organisation** that operates as the collection point shall conduct an on-site audit of the supplier, as described in 5.2.7.

5.2.6 In cases where the material received does not comply with purchase specifications and/or the quantities stated on the invoices are incorrect, the **organisation** that operates as the collection point shall require the supplier to take immediate corrective actions, as required in clause 5.2.3.b and 5.2.3.e.iv. These actions shall be recorded and communicated to the **certification body** during the annual audit.

5.2.7 As part of the conduction of audits of suppliers (producers) of **waste** and **residues**, the **organisation** that operates as the collection point of **waste** and **residues** shall:

- a) Cover suppliers (producers) of **waste** of **residues** during the annual internal audits of their organisation's management system.
- b) The audit of the suppliers can happen remotely, or on-site, depending on the level of risks and type of **waste** and **residues** supplied. Where verification and processing upon receipt of the waste and residues supplies was not sufficient, audits shall take place on-site.
- c) The **organisation** may contract another external, suitably qualified party to operate the supplier audit.
- d) Where the supplier for which an on-site audit is needed sells **waste** or **residues** that were previously collected, classified, and traded by other companies or **sites**, the complete supply chain of these **waste** and **residues** shall be verified back to the point where the classification can be demonstrated through objective evidence.
- e) When necessary to ensure compliance of the suppliers and the supplies with RED II requirements, the organisation shall conduct audits of the suppliers in between annual audits.
- f) At least, a sample consisting of a number of suppliers equivalent to the square root of the total number of suppliers shall be audited on-site once a year. That number shall be increased in the event of a higher level of risk. The sample shall be representative of the whole group and determined using a combination of risk and random selection. Random selection shall represent at least 25 % of the sample. The suppliers selected for the audit shall vary from year to year.

- g) For any **nonconformities** identified during the audit to suppliers, the **organisation** shall:
- i. determine the root cause of the **nonconformity**
 - ii. develop a corrective action plan to address the identified cause
 - iii. specify a timeframe for completion
 - iv. assign responsibilities for the implementation of the action plan
 - v. follow up implementation of the actions by the supplier

5.2.8 If the supplier fails to implement the necessary actions, the **organisation** that operates as the collection point of **waste** and **residues** shall stop sourcing material from the supplier, until the problem is solved.

6. Requirements for the evaluation of Level B evidence for forest biomass

6.1 General requirements

6.1.1 The **organisation** acting as the **first gathering point** of **forest biomass** shall evaluate the compliance of the **forest biomass** with the **RED II sustainability criteria** at the sourcing area level (**Level B**), as per Article 29 (6 b, 7b) of Directive (EU) 2018/2001, where the **Level A** national or sub-national risk assessment does not demonstrate compliance with some or all of the **RED II sustainability criteria**.

6.1.2 The **organisation** acting as the **first gathering point** of **forest biomass** shall establish a management system for the **sourcing area** that ensures compliance with the **RED II sustainability criteria**. The management system shall ensure through contractual or other enforceable means that the producer or producers of **forest biomass** under their **sourcing area**:

- a) hold a recognised PEFC SFM certificate
- b) provide information necessary to evaluate **Level B** evidence, and
- c) accept **second party** and **third party audits** for the assurance of compliance with the **RED II sustainability criteria**, and in case of substantiated concerns of non-compliance with the **RED II sustainability criteria**.
- d) commitment to collaborate with the European Commission and the competent authorities of the EU Member States when requested, including granting access to their facilities.

6.2 Requirements for compliance with the RED II sustainability criteria of the harvesting operations at sourcing area (Level B), as per Article 29 (6 b) of the RED II Directive

6.2.1 General

6.2.1.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer accurate, up-to-date, and verifiable evidence of the spatial boundaries of the **sourcing area** using geographical coordinates or parcels.

6.2.2 Legality of harvesting operations

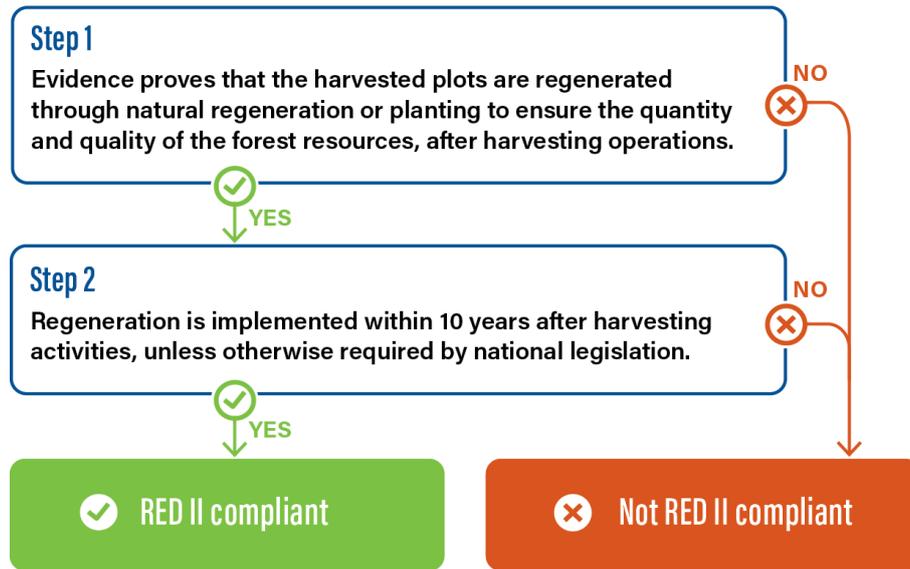
6.2.2.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence that shows compliance of harvesting with Regulation (EU) No 995/2010 of the European Parliament and of the Council (usually known as: EUTR), as per this PEFC ST 5002.

6.2.3 Forest regeneration of harvested areas

6.2.3.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence (e.g., forest management plans, operational protocols, environmental impact assessments, and results of relevant compliance audits and inspections) to ensure that the harvested plots are regenerated in an appropriate manner after harvesting operations.

6.2.3.2 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that regeneration is implemented within 10 years after harvesting activities, unless otherwise required by national legislation.

Figure 10: Stepwise approach for demonstrating compliance with the forest regeneration of harvested area criterion



Note: Appendix 5 includes an informative checklist where **organisations** can find examples of information sources to implement the requirements.

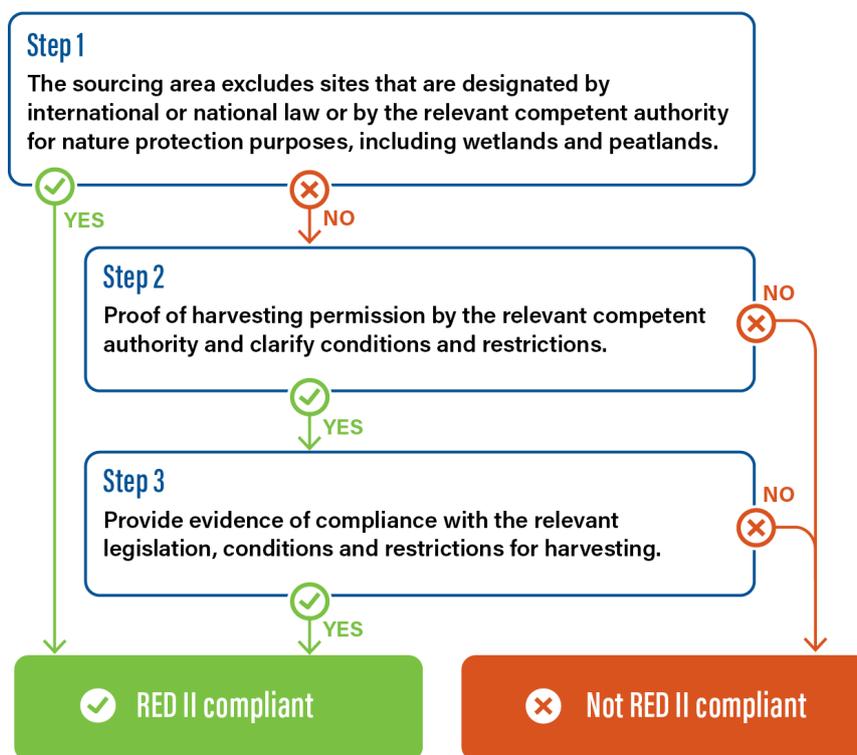
6.2.4 Protection of areas designated for nature conservation purposes

6.2.4.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that inventory, mapping, and planning of forest resources and harvesting operations identify, protect, conserve, or set aside areas designated for nature protection purposes, including in wetlands and peatlands, by international or national law, or by the relevant competent authority.

Note: Harvesting in those areas is not generally prohibited. Where forestry operations have proven documentation on meeting all the requirements to maintain conservation purposes, harvesting could be legitimised.

6.2.4.2 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure, in the case of timber harvesting on these lands, that they have a harvesting permit issued by the relevant competent authority (e.g., in the management plan) and evidence of compliance with the relevant legislation described in operational reports or harvesting protocols (e.g., in the timber sale contract) and the result of relevant compliance audits and inspections (e.g., PEFC SFM audit report).

Figure 11: Stepwise approach for compliance with the area designated for natural conservation purpose criterion



Source: Based on REDIIIBIO study, page 31

Note: Appendix 5 includes an informative checklist where **organisations** can find examples of information sources to implement the requirements.

6.2.5 Maintenance of soil quality and biodiversity

6.2.5.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence that soil types are checked, sensitive areas in terms of soil quality and biodiversity are identified, and potential risks with forest biomass harvesting are assessed in advance.

Note 1: This can be done, e.g., on the basis of soil maps, soil sensitivity maps, or through the provision of detailed field inventory data.

Note 2: Biodiversity also includes habitat features.

6.2.5.2 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that no primary forest or areas designated by international or national law or relevant competent authority for nature protection, including wetlands and peatlands are degraded to or replaced by forest plantations.

Note: See also requirement 6.2.5.3, where it says that large clear-cuts shall be minimised except in cases where it is temporarily justified due to documented forest pests, storms, or other **natural disturbances**.

6.2.5.3 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that large clear-cuts shall be minimised except in cases where it is temporarily justified due to documented forest pests, storms, or other **natural disturbances**.

6.2.5.4 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that forest biomass harvesting in poor or vulnerable soils does not happen, unless in compliance with 6.2.5.5.

Note: Vulnerable soils can be identified on [FAO/UNESCO Soil Map of the World 34](#), Harmonized World Soil Database – FAO 35, and national or regional soil maps.

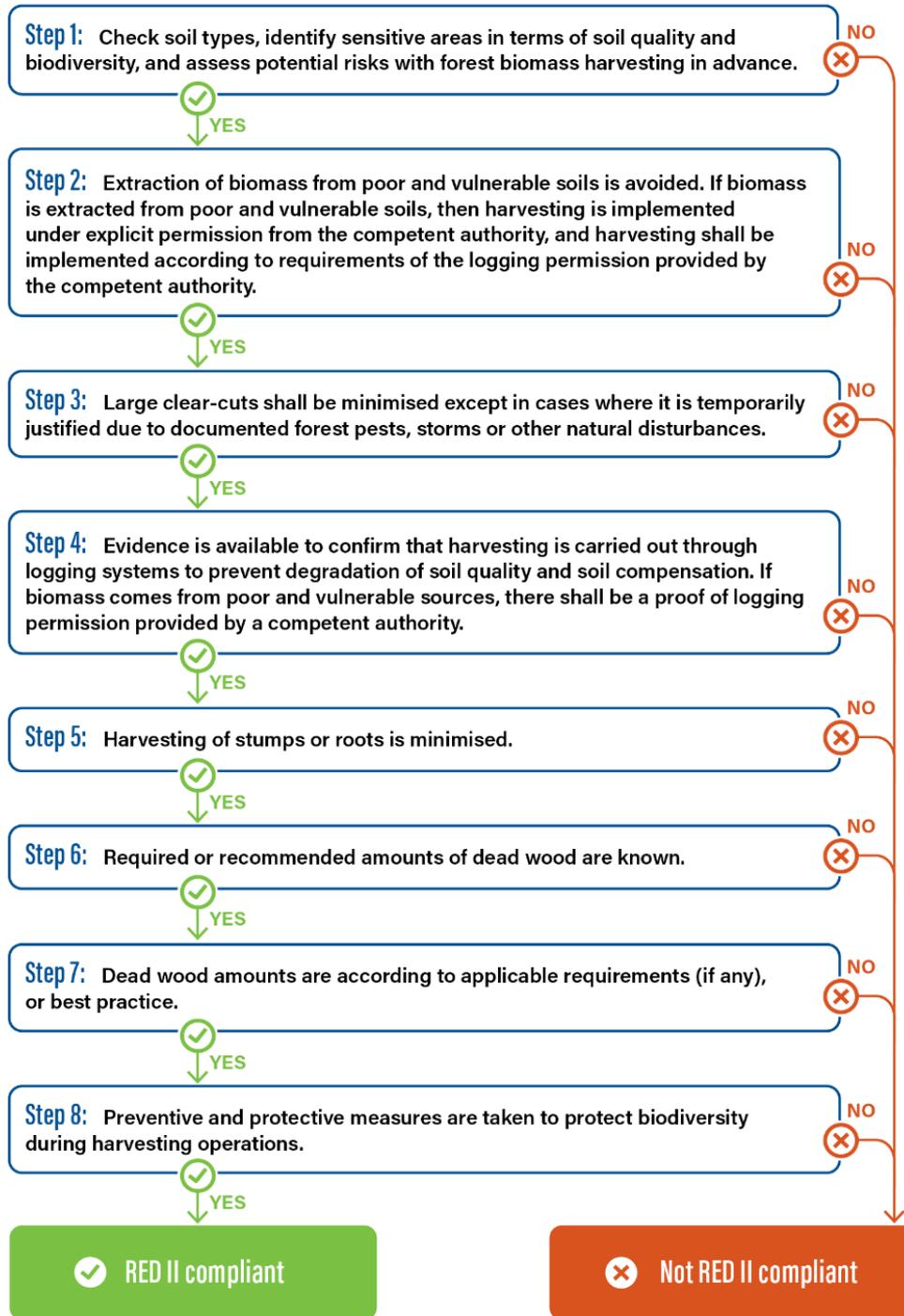
6.2.5.5 **Forest biomass** may be exceptionally extracted from poor and vulnerable soils under explicit permission from the competent authority. If **biomass** comes from poor or vulnerable sources, harvesting shall be implemented according to the requirements of logging permission provided by a competent authority.

6.2.5.6 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that harvesting is carried out through logging systems that prevent degradation of soil quality and soil compensation.

6.2.5.7 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that harvesting of **stumps and roots** is minimised.

6.2.5.8 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that required or recommended amounts of **deadwood** are known and respected, and biodiversity is protected during harvesting operations.

Figure 12: Stepwise approach for compliance with the maintenance of soil quality and biodiversity criterion



Note: Appendix 5 includes an informative checklist where **organisations** can find examples of information sources to implement the requirements.

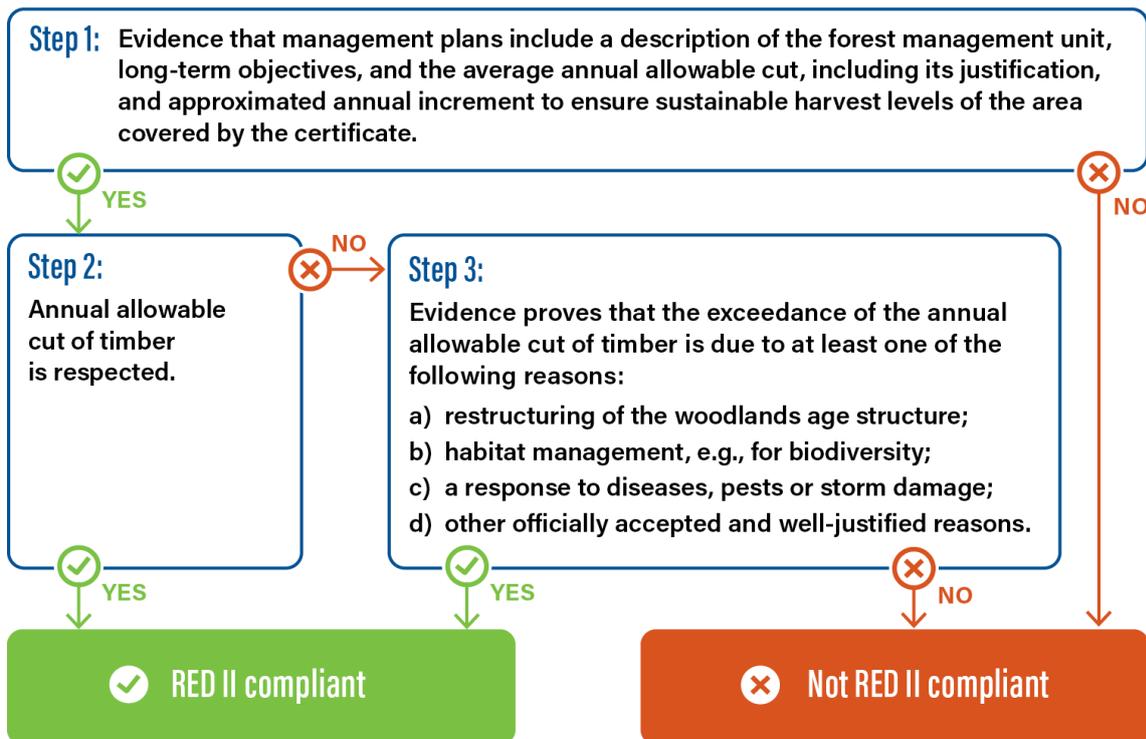
6.2.6 Harvesting maintains or improves the long-term production capacity of forests

6.2.6.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer of the **sourcing area** evidence that management plans include a description of the forest management unit, long-term objectives, and the average annual allowable cut, including its justification, and approximated annual increment to ensure sustainable harvest levels of the **sourcing area**.

6.2.6.2 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that the annual allowable cut of timber is not exceeded, except when there is proven evidence on:

- a) restructuring of the age structure
- b) habitat management, e.g., for biodiversity
- c) as a response to diseases, pests, storm, or other officially accepted and well-justified reasons, e.g., **natural disturbances**

Figure 13: Stepwise approach for compliance with harvesting maintains or improves the long-term production capacity of forests criterion



Source: Based on REDIIIBIO study, page 37

Note: Appendix 5 includes an informative checklist where **organisations** can find examples of information sources to implement the requirements.

6.3 Requirements for compliance with the RED II sustainability criteria for carbon stocks and sinks levels at a certified area (LULUCF), as per Article 29 (7 b) of the RED II Directive¹

6.3.1 General

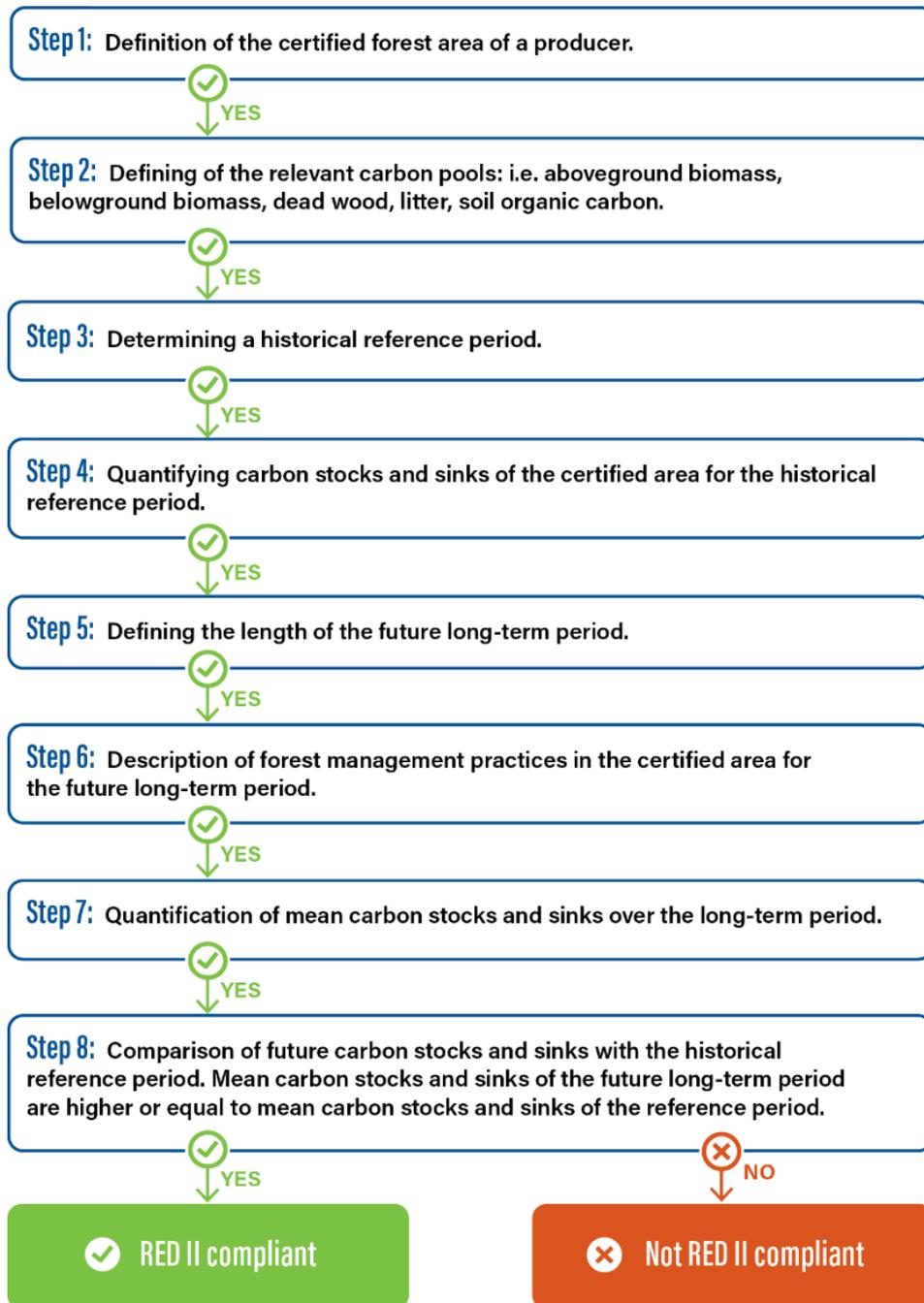
6.3.1.1 The **organisation** acting as the **first gathering point** of the **forest biomass** shall gather from the supplier of **forest biomass** evidence that the management system maintains or strengthens **carbon stocks**, and that sink levels in the forest are maintained or strengthened, both over the long term. Such management systems shall include information from (forward-looking) planning and periodic monitoring of the development of forests and their **carbon stocks** and **sinks**.

6.3.1.2 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure that the following steps are followed at the **sourcing area** in order to comply with the **RED II sustainability criteria** for **carbon stocks** and **sinks**:

- a) defining the **sourcing area**
- b) defining the relevant **carbon pools**
- c) determining a historical reference period
- d) quantifying **carbon stocks** and **sinks** of the certified area for the historical reference period
- e) defining the length of the future long-term period
- f) description of forest management practices in the certified area for the future long-term period
- g) quantification of mean **carbon stocks** and **sinks** over the future long-term period
- h) comparison of future **carbon stocks** and **sinks** with the historical reference period

¹ This chapter was developed based on, and reproduces closely, the REDIIBIO report.

Figure 14: The following figure describes the steps:



Source: REDII BIO study, page 34

Note 1: The approach builds on existing methods for which tools and data can be used that are freely available from public sources. However, it is considered that knowledge of calculations on forest **carbon stocks** and **sinks** is needed to be able to provide evidence for compliance. Furthermore, the approach described below requires **organisations** to obtain evidence from the PEFC SFM certified biomass producer to ensure that the forest management will result in equal or higher **carbon stocks** in the long-term period.

Note 2: Methodologies to assess **carbon stocks** and **sinks** in forests already exist and could be adapted by an **organisation** to provide evidence of compliance with the **LULUCF criteria at sourcing area level**. Such methodologies are used for national level reporting and assessments to UNFCCC (see IPCC supporting documents) under the LULUCF Regulation (see supporting documents by Grassi et al. (Grassi, G., Pilli, R., House, J., Federici, S., Kurz, W.A., 2018. Science-based approach for credible accounting of mitigation in managed forests. Carbon Balance and Management 13, 8.) and Forsell et al. (Forsell, N., Korosuo, A., Federici, S., Gusti, M., Cristóbal, J.J.R., Rüter, S., Jiménez, B.S., Dore, C., Brajterman, O., Gardiner, J., 2018. Guidance on developing and reporting Forest Reference Levels in accordance with Regulation (EU) 2018/841) European Commission Directorate-General for Climate Action, Brussels.) and by voluntary carbon standards for certifying carbon emissions reductions through AFOLU activities at the landscape or stand level. These methodologies serve as a useful starting point for developing approaches to demonstrate compliance with the LULUCF sub-criterion, but they need to be adapted as they have not been designed for demonstrating compliance with RED II. This chapter is built on these existing methodologies.

6.3.2 Definition of the sourcing area

6.3.2.1 In case of **Level B** evaluation, the **sourcing area** comprises the sum of the PEFC certified areas where **forest biomass** is produced and for which compliance with RED II requirements needs to be demonstrated.

Note: When a **sourcing area** does not cover an entire certified area, RED II requirements are to be implemented only for forest units within the certified area that is included in the **sourcing area**, and where **forest biomass** for which compliance with the **RED II sustainability criteria** shall be demonstrated.

6.3.2.2 The **sourcing area** shall be a geographically explicit forest area belonging to a single country or a region, depending on which level forest legislation is regulated. The definition of **sourcing area** shall allow identification of the origin of **forest biomass** through a map, typically defined based on administrative boundaries. Where the **organisation** procures **forest biomass** from more countries or regions with different sets of legislation, then its supply base shall consist of several **sourcing areas**.

6.3.2.3 The sourcing area definition shall support collection of reliable and independent information, in case of **Level B** evaluation produced by forest management authorities or those directly responsible for forest management. The compliance evaluation shall be conducted for a geographically explicit area having sufficiently homogenous conditions and common forest management practices that ensure the implementation of sustainable management in the **sourcing area** during the assessment period.

Note: Spatial boundaries do not need to be a continuous, unfragmented patch of land, but may comprise several unconnected areas.

6.3.2.4 The identification of the **sourcing area** shall clearly differentiate between the **sourcing area** for which **Level A** evidence is applied and for which **Level B** evaluation is required.

Note: The location of the **organisation** does not affect the compliance requirements – it can be located within a **sourcing area** or outside the **sourcing areas**.

Figure 15: Examples of sourcing areas

Scenario 1 - one country, does not comply

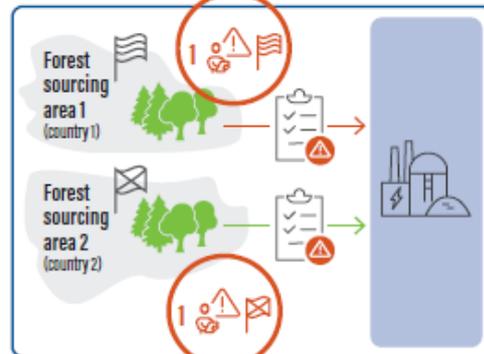


-  The entire supply base of an organisation is based in one country.

-  Country 1 does not comply with one or more RED II sustainability criteria at level A.

-  The organisation shall conduct level B evaluation for a sourcing area that is equal to the whole supply base.

Scenario 2 - two countries, neither complies

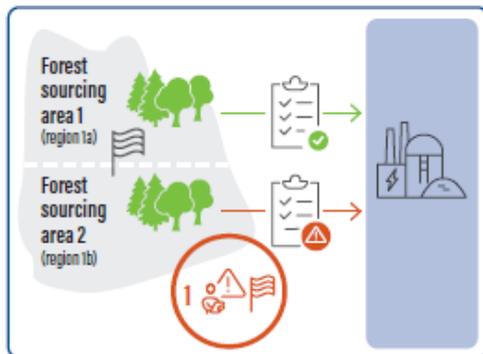


-  An organisation sources biomass from two countries.

-  Neither country 1 nor country 2 complies at level A for one or more RED II sustainability criteria.

-  The organisation shall conduct level B evaluation for two sourcing areas of country 1 and country 2.

Scenario 3 - one country, one region does not comply

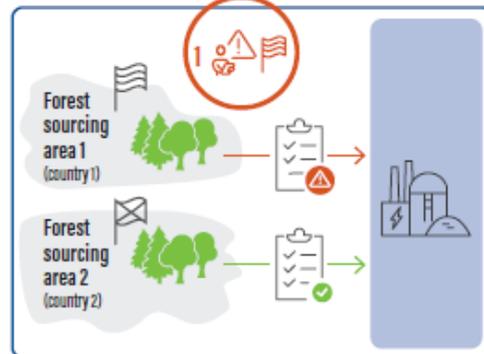


-  An organisation acquires biomass from two regions within one country. The country has sub-national legislation in the area of harvest.

-  Region 1a complies with RED II sustainability criteria at level A and region 1b is non-compliant for one or more criteria.

-  Therefore there is no country-level compliance at level A and level B evaluation is needed to demonstrate compliance for the failed level A criteria, for the entire supply base (country).

Scenario 4 - two countries, one does not comply



-  The supply base of an organisation is based in country 1, while it sources biomass also from country 2.

-  Country 1 does not comply at level A for one or more criteria, while country 2 does comply at level A for all criteria.

-  The organisation shall conduct level B evaluation for failed level A criteria for forest sourcing area 1.

Source: REDII BIO study, page 9 and 10

6.3.3 Defining of the relevant carbon pools

6.3.3.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to ensure maintenance or increasing carbon stock and sink levels at the certified forest area level, without specifying which **carbon pools** to consider.

6.3.3.2 As **carbon stocks** and **sinks** in forests may include multiple pools, the **organisation** acting as the **first gathering point** may accept evidence from the PEFC SFM certified biomass producer that the producer follows good practice, such as considering all the **carbon pools** in forests, as specified by UNFCCC, which includes:

- a) aboveground **biomass**
- b) belowground **biomass**
- c) litter
- d) **deadwood**
- e) soil (mineral and organic soils)

Note: These pools also encompass the **carbon pools** considered relevant by the LULUCF Regulation (EU 2018/841, Annex 1, Section B), except the Harvested Wood Products pool. The Harvested Wood Products pool can be excluded because it is not a forest **carbon pool**.

6.3.4 Determining a historical reference period

6.3.4.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence of use of the average **carbon stocks** and **sinks** over a reference period that will serve as a benchmark against which maintenance or strengthening of **carbon stocks** and **sinks** of a certified area will be compared.

Note: RED II does not specify a historical year or period that can serve as a reference to compare the future development of **carbon stocks** and **sinks** in the certified area.

6.3.4.2 The **organisation** acting as the **first gathering point** may allow the PEFC SFM certified biomass producer to use a fixed period to avoid the effects of biomass harvest progressively lowering **carbon stocks** and **sinks**. The selected reference period should reflect representative **carbon stocks** and **sinks** in the supply area (i.e., is consistent with any broader historical data used as evidence). In line with the reference period used in the LULUCF Regulation (EU 2018/841), the **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence that the biomass focus on the period 2000-2009. Another period of similar length and as close as possible to 2000-2009 may be accepted to facilitate the use of forest inventory data or to mitigate the impact of annual disturbance or any eventual stochastic events on the levels of **carbon stocks** and **sinks** in the certified area.

6.3.4.3 The **organisation** acting as the **first gathering point** shall require the PEFC SFM certified biomass producer to justify the definition of their reference period.

Note: The **organisation** acting as the **first gathering point** should consider that the PEFC SFM certified biomass producer should avoid using short periods (or a single year) as reference periods in which significant **natural disturbance** occurred as they may strongly disrupt forest **carbon stocks** and especially **sinks**.

6.3.5 Quantifying carbon stocks and sinks of the certified area for the historical reference period

6.3.5.1 The **organisation** acting as the **first gathering point** shall require the PEFC SFM certified biomass producer to collect and provide relevant and sufficient data to estimate mean values for **carbon stocks** and **sinks** of the certified area during the historical reference period as reference values for a compliance check.

Note: Data on **carbon stocks** and **sinks** in the certified area may be obtained from (repeated) forest inventories or forest management plans, provided they are transparent, accurate and reliable. If there are no existing data on **carbon stocks** and **sinks** in the certified area, PEFC SFM certified **organisations** can estimate the mean **carbon stocks** and **sinks** of the certified area for the historical reference period, for example, by applying forest carbon calculators or models (see Appendix 6, Table 9). Data (tree species, growing stock, age structure, increment rate, etc.) to be used in these tools can be obtained from historical forest management plans or inventories conducted in the certified area. Additional data (e.g., basic wood density, carbon content, factors to estimate whole-tree **biomass**) may be needed to provide necessary information on all the relevant **carbon pools** (see step 6.3.3).

6.3.5.2 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence that should provide or estimate reference values for all relevant **carbon pools** individually. When estimating historical **carbon stocks** and **sinks**, it is recommended to further stratify the certified area in homogenous units.

Note 1: When stratifying the certified area, PEFC SFM certified biomass producers can consider some of the following factors:

- a) Administrative/legal conditions:
 - i. An administrative region where the certified level is located (e.g., region, province, municipality)
 - ii. Ownership type (e.g., private, public)
- b) Biophysical conditions:
 - i. Topography
 - ii. Site conditions (e.g., forest site index)
- c) Forest characteristics:
 - i. Tree species composition
 - ii. Forest management regime

Note 2: In case the PEFC SFM certified biomass producer is not able to quantify one of the above-mentioned pools (e.g., litter or soil carbon, see step 6.3.3), it is recommended that a justification is provided as why a pool cannot be quantified (e.g., absence of data on the litter or soil **carbon pools**) and why omitting the pool does not affect compliance with the requirement to maintain or strengthen **carbon stocks** in the long term.

6.3.6 Defining the length of the future long-term period

6.3.6.1 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence that the producer conducts a compliance check for a long-term period. This period shall be, as a minimum, 30 years.

Note: To define the period to be considered, the size of the certified area is relevant. In a small certified area, it can be expected that a long period needs to be considered for demonstrating that **carbon stocks** and **sinks** are maintained or strengthened, while for a larger area, a shorter period may suffice. Two main issues influence the methodological decisions of the proposed stepwise approach:

- a) According to RED II, Article 29, the **sustainability and GHG emissions saving characteristics** criteria apply only to **installations** producing electricity, heating, cooling, and fuels with a total rated thermal input equal to or exceeding 20 MW in the case of solid **biomass fuels** and in the **installations** with a total rated thermal input equal or exceeding 2MW in the case of gaseous **biomass fuels**. The forest **sourcing areas** of such **installations** are considered to comprise a large area, covering multiple forest stands and age classes. Accordingly, **carbon stocks** and **sinks** of such area can be maintained or strengthened over a time period shorter than an average rotation period of a single forest stand. The certified area is not necessarily related to a continuous, unfragmented patch of land, but may comprise several mutually unconnected areas.
- b) The temporal boundaries of the compliance check are recommended to be set to a period of at least 30 years, in line with Article 15 of EU Regulation 2018/1999. This Regulation requests EU Member States to submit long-term strategies for GHG emissions reduction with a perspective of at least 30 years. Defining the temporal boundaries as at least 30 years ensures that **organisations** and EU member states are subject to a similar level of stringency.

6.3.7 Describing forest management practices in the sourcing area for the future long-term period

6.3.7.1 The **organisation** acting as the **first gathering point** shall obtain from PEFC SFM certified biomass producer a description of the forest management practices that can be implemented in the long term to prove that **carbon stocks** and **sinks** are strengthened or maintained over a long-term period (recommended 30 years, see 6.3.6).

6.3.7.2 Information on future forest management may be derived from existing forest management plans or other verifiable evidence. The future forest management practices must, at minimum, comply with legal requirements that are valid in a certified area.

Note: When describing the future forest management practices in the **sourcing area**, the following factors could be considered that may affect the development and calculation of forest carbon balances and sinks in subsequent steps:

- a) annual harvest level
- b) tree species composition
- c) forest reproductive material used (provenance)
- d) thinning intensity and frequency
- e) cutting regime (e.g., even-aged clearcutting, shelterwood, group or tree selection, coppice)
- f) other management decisions (e.g., fertilisation, drainage, herbicide and pesticide application, etc.)
- g) average minimum and maximum rotation length

Potential data sources for these factors are listed in Appendix 6, Table 10

6.3.8 Quantifying mean carbon stocks and sinks over the future long-term period

- 6.3.8.1** The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence that the producer develops a projection of the development of **carbon stocks** and **sinks** in the certified area, based on forest growth and planned management practices, to assess how **carbon stocks** and **sinks** will develop over the long term.
- 6.3.8.2** When developing those projections, the **organisation** acting as the **first gathering point** shall require the PEFC SFM certified biomass producer to avoid assumptions on the effects of future impact of policies and markets as much as possible.

Note: PEFC SFM certified **organisations** can apply forest carbon calculators and models (for an overview of potential tools, see Appendix 6, Table 9) as a basis for these calculations. Such tools will require information on future forest management practices (see 6.3.7), forest structure (e.g., tree species, growing stock, age structure) and growth (increment), as well as additional data (e.g., basic wood density, carbon content, factors to estimate whole-tree **biomass**).

- 6.3.8.3** The **organisation** acting as the **first gathering point** shall require the PEFC SFM certified biomass producer to stratify the certified area in homogenous units to improve the accuracy of the estimates according to the recommendations provided in 6.3.5.
- 6.3.8.4** The **organisation** acting as the **first gathering point** shall require that the PEFC SFM certified biomass producer shall use the same **carbon pools** (see 6.3.3), data and methods for estimating **carbon stocks** and **sinks** in the reference period to ensure comparability of the estimates. The future and historically oriented estimates shall be methodologically and quantitatively comparable.
- 6.3.8.5** The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer a justification for why a **carbon pool** cannot be quantified (e.g., absence of data on the litter or soil **carbon pools**) in a case when they are not able to quantify any of the abovementioned pools (e.g., litter or soil carbon, see 6.3.3)
- 6.3.8.6** The **organisation** acting as the **first gathering point** shall require the PEFC SFM certified biomass producer to consider relevant secondary data and information to explain how **forest biomass** removals are expected to affect these **carbon pools** in the long term at the certified area.
- 6.3.8.7** The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence that documents the temporal development of all **carbon pools** to facilitate the comparison with results obtained from monitoring, as a basis for verifying compliance under RED II Article 30.

6.3.9 Comparing future carbon stocks and sinks with the historical reference period

- 6.3.9.1** The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence to prove compliance with the carbon stock and sink level criterion (LULUCF criterion) by comparing both the mean **carbon stocks** and **sinks** for the future long-term period (6.3.8) with the **carbon stocks** and sinks of the reference period (6.3.5). If the mean **carbon stocks** and **sinks** of a long-term period **sinks** are higher or equal to the mean **carbon stocks** and **sinks** of a reference period, the evidence is compliant with the LULUCF criteria.
- 6.3.9.2** The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM certified biomass producer evidence on the use of a monitoring and verification system of the actual development of **carbon stocks** and **sinks** to support documentation of compliance. The monitoring activities shall verify estimates of future **carbon stocks** and **sinks** as estimated by carbon models. This monitoring shall consider uncertainties, non-permanence, and time dynamics.

Note: Actual forest developments might differ from the modelled development, for example, as a result of changes in forest management objectives and practices or **natural disturbances**.

6.3.9.3 The **organisation** acting as the **first gathering point** shall obtain from the PEFC SFM biomass producer evidence to ensure that the producer adapts its forest management when there are deviations between the projected and actual development of **carbon stocks** and **sinks** due to **natural disturbances**. Management plans need to consider such circumstances and be flexible enough to respond. Assessments of likely disturbances shall be an integral part of the plan.

Note: Some tree species may be negatively affected by climate change through changes in productivity or **natural disturbances**, which could negatively affect the development of their carbon stock and sink levels over the long term. A change of tree species (or provenance), or another change in the management of the future stand to anticipate or adapt to new conditions, may result in a (temporary) decrease in **carbon stocks** and **sinks** in the short term with the aim to maintain or strengthen **carbon stocks** and **sinks** in the long term. It may be necessary to allow for a temporary reduction of **carbon stocks** and **sinks** if this will result in maintaining or strengthening **carbon stocks** and **sinks** in the long term. At the certified area level, **carbon stocks** and **sinks** levels in the forest are considered to be maintained or strengthened over the long term if forest management will be continued or improved on the basis of regionally adopted specific site-suitable practices under current and future conditions.

7. GHG calculations requirements

7.1 General

7.1.1 According to Article 29(10) of the RED II Directive, the **organisation** shall obtain from the use of biomass fuels the following GHG emission savings:

- a) at least 70% for electricity, heating and cooling production from **biomass fuels** used in **installations** starting operation from 1 January 2021 until 31 December 2025, and
- b) 80% for **installations** starting operation from 1 January 2026.

7.1.2 To demonstrate compliance with Article 29(10) of the RED II Directive through the PEFC scheme as per 7.1.1, the **organisation** shall calculate their GHG emissions savings in compliance with this chapter.

7.1.3 The **organisation** actually converting **forest biomass** and **ligno-cellulosic material** from **residues** and **waste** into electricity, heat or cooling shall calculate the GHG emissions savings from the use of **forest biomass** and **ligno-cellulosic material** from **residues** and **waste**. The previous **organisations** on the supply chain shall provide any information required to calculate those emission savings, as per ST 5002.

7.1.4 The **organisation** shall calculate the GHG emissions saving from the use of **biomass fuels** in one of the following ways:

- a) Where a **default value** for GHG emissions saving for the production pathway is laid down in Part A of Annex VI of RED II Directive for biomass fuels where the e_l value for those biomass fuels calculated in accordance with point 7 of Part B of Annex VI of RED II Directive is equal to or less than zero, by using that **default value**.

Note 1: Point 7 of part B of Annex VI of RED II Directive refers to emissions from land-use change. e_l (annualised emissions from carbon stock changes caused by land-use change) will be less or equal to zero whenever the biomass comes from **forestry residues**, processing **residues** originating in forest-related industries and/or **wastes**. If the **organisation** is sourcing other than biomass from **forestry residues**, processing **residues** originating in forest-related industries and/or **wastes**, the **organisation** will have to calculate the e_l according to section 7.4 of this chapter. If according to this calculation, the **organisation** can demonstrate that e_l is less or equal to zero, the **organisation** can use the **default values** defined on Part A of Annex VI of RED II Directive.

Note 2: Default values are displayed on Appendix 2 and 3 of ST 5002, based on Annex VI of the RED II Directive. Concretely, Part A of Annex VI is included in Appendix 2.

Note 3: Default values listed in Annex VI of RED II Directive can only be applied if the process technology and feedstock used for the production of the fuel match their description and scope, and the transport distance. For example, they cannot use the **default value** "Woodchips from short rotation coppice (Poplar – Fertilised)" if their wood chips do not exactly match this description and if it is not in their scope. In case specific technologies are set out, the **default values** can only be used if those technologies were actually applied.

Note 4: Default values have been calculated as average GHG emissions resulted from specific **forest biomass** used by the application of pre-determined factors.

Note 5: Point 7 of part B of Annex VI of RED II Directive refers to emissions from land-use change.

- b) By using an **actual value** calculated in accordance with the methodology described from part 7.2 until 7.13 of this document, based on part B of Annex VI of RED II Directive or;

Note 1: Actual value is the result of the calculation of the GHG emissions savings for some or all of the steps of a specific biomass fuel production process, calculated in accordance with the methodology in Part B of Annex VI of the RED II Directive.

Note 2: Information on actual GHG emissions has to be provided for all relevant elements of the GHG emission calculation formula. 'Relevant' refers in this context to elements for which reporting is obligatory (e.g., e_i in case of land use change), all elements for which **actual values** should be used instead of disaggregated **default values** and all elements related to emission savings (if applicable). If at any point of the chain of custody emissions have occurred and are not recorded, so that the calculation of an **actual value** is no longer feasible for operators downstream in the chain of custody, this must be clearly indicated in the delivery notes.

Note 3: Actual values can only be calculated when all relevant information is available and transmitted through the chain of custody:

- i. **Actual values** of emissions from cultivation can only be determined at the origin of the chain of custody.
- ii. **Actual values** of emissions from transport can only be determined if emissions of all transport steps are recorded and transmitted through the chain of custody.
- iii. **Actual values** of emissions from processing can only be determined if emissions of all processing steps are recorded and transmitted through the chain of custody.

Note 4: Standard calculation values published in Annex IX of the Implementing Regulation 2022/996 shall be applied whenever available.

- c) By using a value calculated as the sum of the factors of the formulas referred to in point 1 of Part B of Annex VI of RED II Directive, where disaggregated **default values** in Part C of Annex VI of RED II Directive may be used for some factors, and **actual values**, calculated in accordance with the methodology laid down in Part B of Annex VI of RED II Directive, are used for all other factors.

Note 1: This means than implementing the formula as per 7.2.1, the **organisation** can combine the use of **default values**, when appropriate, and **actual values** for some of the elements of the formula, following the calculations established in this chapter.

Note 2: Disaggregated **default values** listed in Annex VI of RED II Directive can only be applied if the process technology and feedstock used for the production of the fuel match their description and scope, and the transport distance. In case specific technologies are set out, the disaggregated **default values** can only be used if those technologies were actually applied.

Note 3: Disaggregated **default values** can only be applied if the e_i value for those **biomass fuels** calculated in accordance with point 7 of Part B of Annex VI of RED II Directive is equal or less than zero.

Note 4: Disaggregated values can only be applied to certain elements in the supply chain: e_{ec} , e_p , e_{td} and e_u .

7.1.5 The **organisation** shall only make actual GHG values declarations after their capability to conduct actual value calculations has been verified by the **certification body**.

7.1.6 The **organisation** conducting the GHG calculations shall receive from the supply chain all information that is relevant for establishing compliance with the EU sustainability criteria for **biomass fuel** and the GHG emissions information.

Note: When **default values** are used, information on GHG emissions should only be reported for final **biomass fuels** and can be reported as an aggregate. If relevant, both, the process technology and the raw material used need to be specified

7.1.7 The information shall include accurate data on all relevant elements of the emission calculation formula.

7.1.8 The **organisation** shall report GHG emissions using appropriate units. These are:

- a) g CO₂eq/dry-ton for raw materials and intermediary products
- b) g CO₂eq/MJ of final energy commodity (electricity or heat) for electricity and heating produced from biomass products

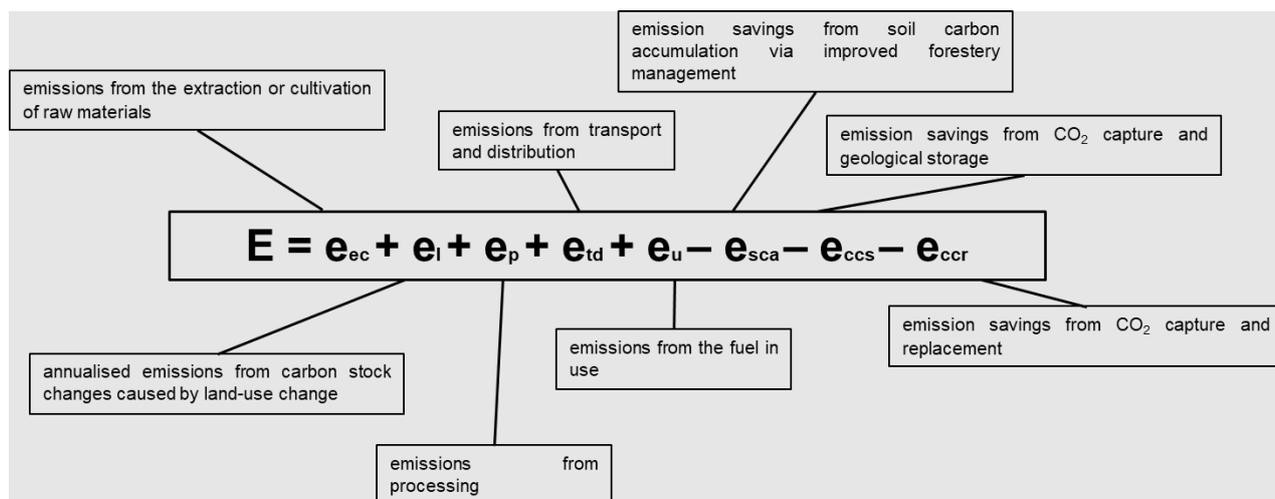
7.1.9 If an **organisation** acting as electricity, heat and cooling producers have decided to use **actual values** (7.1.3.b) or a combination of disaggregated **default values** and **actual values** (7.1.3.c), the **organisation** shall collect all the necessary information from upstream suppliers in order to calculate them.

7.1.10 To calculate the saving emissions based on **actual values** (7.1.3.b) or a combination of disaggregated **default values** and **actual values** (7.1.3.c), the **organisation** shall:

- a) calculate GHGs from the production and use of **biomass fuels** before conversion into electricity, heating, and cooling (E).
- b) calculate GHGs from the use of **biomass fuels** in producing electricity, heating and cooling, including the energy conversion to electricity and/or heat or cooling produced (EC_{el} and/or EC_h).

7.2 GHGs from the production and use of biomass fuels before conversion into electricity, heating and cooling (E)

7.2.1 The **organisation** shall calculate GHG emissions from the production and use of **biomass fuels** before conversion into electricity, heating and cooling:



7.2.2 Emissions from the manufacture of machinery and equipment shall not be taken into account.

7.2.3 "E" shall be expressed in terms of grams of CO₂ equivalent per MJ of **biomass fuel**, g CO₂eq/MJ.

7.2.4 The greenhouse gasses (GHG) shall cover: CO₂, N₂O and CH₄. For the purpose of calculating CO₂ equivalence, these gases are associated with the following values:

Greenhouse Gas	CO ₂ Equivalence
CO ₂	1
N ₂ O	298
CH ₄	25

7.3 Emissions for forest based raw material extraction or cultivation (e_{ec})

7.3.1 When an **organisation** intends on using **default values** for the calculation of e_{ec} , the **organisation** shall refer to Part C of Annex VI of RED II (also listed in appendix 3 of this document).

7.3.2 When using **actual values**, the **organisation** shall calculate the emissions from the wood extraction or cultivation of raw materials (e_{ec}), including emissions from: the extraction, harvesting or cultivation process itself; the collection, drying and storage of raw materials; **waste** and leakages; the production of chemicals or products used in extraction or cultivation.

7.3.3 Capture of CO₂ in the cultivation of raw materials shall be excluded.

Note 1: Refer to 7.1.4(c) for specific requirements on the application of **default values**.

Note 2: Slash (e.g., branches left on the ground after logging) is equal to 0 up to the process of collection.

7.3.4 As indicated in point 5 of part B of Annex VI of RED II Directive, as an alternative to using **actual values**, the **organisation** may derive estimates of emissions from cultivation and harvesting of **forest biomass** from the use of averages for cultivation and harvesting emissions calculated for geographical areas at national level.

7.4 Emissions for land use change (e_l)

7.4.1 In the case of land-use changes (converted areas) that took place on or after the cut-off date of 1 January 2008 and on which cultivation is permitted, under Article 29 of Directive (EU) 2018/2001, the **organisation** shall calculate the accumulated GHG emissions resulting from the land-use changes (e_l) and added to the other emission values.

7.4.2 No conversion of grassland to forestland after 2008 is permitted under the scheme.

Note: The term "land use changes" refers to changes among the six land categories recognised by the Intergovernmental Panel on Climate Change (IPCC) (forest land, grassland, cropland, wetlands, settlements and other land).

7.4.3 Cropland and perennial cropland shall be regarded as one land use.

Note: Perennial crops are defined as multi-annual crops, the stem of which is usually not annually harvested such as short rotation coppice and oil palm.

7.4.4 If evidence is provided that the cropland was categorised as "cropland" on 1 January 2008, or the forestry as "forest" on the cut-off date 1 January 2008, and no change in land use took place after the cut-off date 1 January 2008, e_l equals "0".

7.4.5 GHG emissions from changes in **carbon stocks** resulting from land-use change (e_l) are to be calculated in accordance with the RED II Directive and Commission Decision 2010/335/EU of 10 June 2010.

7.4.6 According to the RED II Directive (Annex VI. Part B. No9), e_l shall be calculated by dividing total emissions equally over 20 years. For the calculation of those emissions the following rule shall be applied:

$$e_l = (CS_R - CS_A) \times 3.664 \times \frac{1}{20} \times \frac{1}{P}$$

where

e_l = annualised GHG emissions from carbon stock change due to land-use change (measured as mass of CO₂-equivalent per unit biomass fuel energy).

CS_R = **carbon stock** per unit area associated with the reference land use (measured as mass (tonnes) of carbon per unit area, including both soil and vegetation). The reference land use shall be the land use in January 2008 or 20 years before the raw material was obtained, whichever was the later.

CS_A = the **carbon stock** per unit area associated with the actual land use (measured as mass (tonnes) of carbon per unit area, including both soil and vegetation). In cases where the **carbon stock** accumulates over more than one year, the value attributed to CSA shall be the estimated stock per unit area after 20 years or when the crop reaches maturity, whichever the earlier.

P= the productivity of the crop (measured as biomass fuel energy per unit area per year).

7.4.7 The **organisation** can attribute a bonus (eB) of 29 g CO₂eq/MJ **biomass fuel** if **biomass** is obtained from restored degraded land, if evidence is provided that the land:

- a) was not in use for agriculture in January 2008 or any other activity; and
- b) is severely degraded land, including such land that was formerly in agricultural use.

Note: ‘Severely degraded land’ means land that, for a significant period of time, has either been significantly salinated or presented significantly low organic matter content and has been severely eroded.

7.4.8 The bonus of 29 g CO₂eq/MJ shall apply for a period of up to 20 years from the date of conversion of the land to agricultural use, provided that a steady increase in **carbon stocks** as well as a sizable reduction in erosion phenomena for land falling under b are ensured.

7.4.9 In accordance with point 10 of Part C of Annex V to RED II Directive, Commission Decision 2010/335/EU which provides guidelines for the calculation of land **carbon stocks** in relation to this Directive, shall serve as the basis for the calculation of land **carbon stocks**.

Note 1: Commission Decision 2010/335/EU provides guidelines for the calculation of land **carbon stocks** in relation to this Directive, drawing on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories – volume 4, and in accordance with Regulations (EU) No 525/2013 and (EU) 2018/841.

Note 2: Commission Decision 2010/335/EU of 10 June 2010 is due for review (as set out in Annex V, part C, point 10, Annex VI, part B, point 10). Any changes will be implemented by PEFC with immediate effect.

7.5 Emissions for processing (e_p)

7.5.1 Emissions from processing, e_p , shall include emissions from:

- a) the processing itself
- b) from **waste** and leakages
- c) the production of chemicals or products used in processing, including the CO₂ emissions corresponding to the carbon contents of fossil inputs, whether or not actually combusted in the process.

7.5.2 Emissions arising from chemicals and energy that are also indirectly linked to the production of **biomass fuels** must be included. Emissions from processing include emissions from drying intermediate products and materials, where appropriate.

7.5.3 When calculating emissions for processing (e_p) with **default values**, the **organisation** shall refer to Part C of Annex VI of REDII, which proposes **default values** for e_p (also listed in appendix 3 of this document).

7.5.4 When calculating emissions for processing (e_p) with **actual values**, the following formula can be applied, which applies to one processing step at a time:

$$e_p = \frac{EM_{electricity} \left[\frac{kgCO_2eq}{year} \right] + EM_{heat} \left[\frac{kgCO_2eq}{year} \right] + EM_{inputs\ production} \left[\frac{kgCO_2eq}{year} \right] + EM_{wastewater} \left[\frac{kgCO_2eq}{year} \right]}{yield_{dry\ feedstock_a} \left[\frac{Kg\ dry\ feedstock_a}{year} \right]}$$

Emissions for processing (e_p) with actual values is specified in mass units in relation to the dry matter content of the main product (kgCO₂eq/kg dry).

Note: Formula components in detail:

$$EM_{electricity} \left[\frac{kgCO_2eq}{year} \right] = electricity\ consumption \left[\frac{kWh}{year} \right] \times Ef_{electricity} \left[\frac{kgCO_2eq}{kWh} \right]$$

$$EM_{heat} \left[\frac{kgCO_2eq}{year} \right] = fuel\ consumption \left[\frac{kg}{year} \right] \times Ef_{fuel} \left[\frac{kgCO_2eq}{kg} \right]$$

$$EM_{inputs\ production} \left[\frac{kgCO_2eq}{year} \right] = inputs\ production \left[\frac{kg}{year} \right] \times Ef_{inputs\ production} \left[\frac{kgCO_2eq}{kg} \right]$$

$$EM_{wastewater} \left[\frac{kgCO_2eq}{year} \right] = wastewater \left[\frac{l}{year} \right] \times Ef_{wastewater} \left[\frac{kgCO_2eq}{l} \right]$$

$$Yield_{feedstock} \left[\frac{kg_{yield}}{year} \right] = yield\ of\ the\ feedstock\ in\ kg\ per\ year$$

The annual yield of the feedstock relates to the dry matter content.

7.5.5 To calculate the GHG emissions from processing (e_p), the following data at a minimum must be collected on **site**, i.e., the respective values are taken from, e.g., company documents:

- a) electricity consumption [kWh/year] – annual total electricity consumption
- b) heat generation – type of fuel/combustible used to produce steam (e.g., heating oil, gas, agricultural crop residues)
- c) fuel consumption [kg/year] – total annual consumption of fuel for heat production, e.g., heating oil [kg], gas [kg], bagasse [kg]
- d) production of inputs [kg/year] – quantity of chemicals or additional products (inputs) used in processing
- e) wastewater quantity [l/year] – quantity of wastewater per year
- f) yield main product [kg/year] – annual harvest of the main product

7.5.6 Input data for calculating the processing emissions in the production chain must be measured or based on technical specifications of the processing plant. If the range of emissions for a group of processing plants (which the respective plant belongs to) is known, the most conservative emission value (highest) for this group is to be used. Actual emission values for processing can only be determined if all of the information about emissions relevant to the inter-face is recorded and consistently passed along through the production chain. Other emissions from processing have to be added to e_p .

7.5.7 The values (emission factors, calorific values, etc.) shall be taken from Annex IX of the IR 2022/996 to calculate e_p .

Note: In case Annex IX of the IR 2022/996 does not include the necessary values, a scientific literature source or scientifically recognised database (ex: ECOINVENT database) can be used. The source must be cited for values taken from scientific literature sources or scientifically recognised databases. If there are different values, the most conservative value is to be used.

7.5.8 In accounting for the consumption of electricity not produced within the fuel production plant, the greenhouse gas emissions intensity of the production and distribution of that electricity shall be assumed to be equal to the average emission intensity of the production and distribution of electricity in a defined region (i.e., national level). The emission factors set out in Annex IX of the IR 2022/996 shall be applied if available.

7.6 Emissions from transport and distribution (e_{td})

7.6.1 Emissions from transport and distribution (e_{td}) shall include emissions from the transport of raw and semi-finished materials and from the storage and distribution of finished materials. Emissions from transport and distribution to be taken into account under e_{ec} shall not be covered by this point.

Note: This means, for example, that the machines used to conduct the harvesting operations are not included in this point.

7.6.2 The **organisation** undertaking this type of freight transport must then calculate the GHG emissions for their vehicle fleet and can rely on the following formula:

$$e_{td} \left[\frac{gCO_2eq}{MJ} \right] = \frac{\left(e \left[\frac{gCO_2eq}{MJ} \right] \times t \left[\frac{MJ}{t.km} \right] \times d[km] \times p \right)}{w \left[\frac{MJ}{t} \right]}$$

where

e is emissions coefficient (g CO₂eq /MJ) depends on the type of fuel used (fuel oil, diesel, natural gas, etc.)

t is transport efficiencies depends on the type of vehicle and material transported (MJ/t.km)

d is the weighted average distance (km)

p is the backhaul factor of the vehicle (between 0.5 and 1)

w is the weighted biomass LHV (MJ/t)

Note: Emissions coefficient and transport efficiencies can be found in the Annex IX of the IR.

7.7 Emissions from the fuel in use (e_u)

7.7.1 Emissions of CO₂ from fuel in use (e_u) shall be taken to be zero for **biomass fuels**.

7.7.2 Emissions of non-CO₂ GHG (CH₄ and N₂O) from the fuel in use shall be included in the e_u factor (detailed in the Annex VI part C of RED II Directive).

7.8 Emissions savings from soil carbon accumulation via improved management (e_{sca})

7.8.1 Emission savings from soil carbon accumulation via improved management (e_{sca}) shall be taken to be zero because e_{sca} is not within the scope of the PEFC scheme.

7.9 Emissions savings from CO₂ capture and geological storage (e_{ccs})

7.9.1 Emission savings from CO₂ capture and geological storage (e_{ccs}) that have not already been accounted for in e_p , shall be limited to emissions avoided through the capture and storage of emitted CO₂ directly related to the extraction, transport, processing and distribution of **biomass fuel** if stored in compliance with Directive 2009/31/EC. (RED II Directive - Annex VI, Part B. No14)

7.9.2 Emission savings from CO₂ capture and geological storage (e_{ccs}) may only be taken into account where there is valid evidence that CO₂ was effectively captured and safely stored. The **organisation** shall make sure that the storage facility is in good condition and without leakages. (RED II Directive, Annex VI, Part B. No14). Where a third party carries out the transport or geological storage, the **organisation** may provide the proof of storage through the relevant contracts with and invoices of that third party (Article 20 of the IR 2022/996).

7.9.3 The emission saved must relate directly to the production of the biofuel they are attributed to. It means that all biofuels originating from the same process would need to be treated equally. If the CO₂ is not captured continuously, it might be appropriate to deviate from this approach and to attribute different amounts of savings to biofuel obtained from the same process. However, in no case a higher amount of savings should be allocated to a given batch of biofuel than the average amount of CO₂ captured per MJ of biofuel in a hypothetical process where the entire CO₂ stemming from the production process is captured. Capturing and processing of CO₂ has its own GHG emission footprint. Those emissions have to be taken into account in the calculation applying the appropriate emission factors for the energy consumed and the inputs used for capturing and processing of CO₂.

7.9.4 To verify that the capturing of CO₂ is used in commercial products and services to replace fossil-derived CO₂, it would suffice to check that the CO₂ was sold to an **organisation** that can be expected to have an economical meaningful use for the CO₂. Then, the buyer should provide information how the CO₂ that is replaced was generated previously and declare, in writing, that due to the replacement emissions are avoided.

Note 1: It would be for the auditor to decide case by case whether the requirements of the Renewable Energy Directive are met including that emissions are actually avoided.

Note 2: Until further notice it is not required to conduct audits on the premises of the buyer as the buyer of the CO₂ is not part of the chain of custody related to the biofuel production, unless there is reasonable suspicion that the written declaration contains false information.

7.9.5 By default, the emission savings from CO₂ capture and geological storage e_{ccs} is set to 0.

7.9.6 The following formula shall be used to calculate e_{ccs} :

$$e_{ccs} \left[\frac{gCO_2eq}{MJ_{fuel}} \right] = \frac{\text{produced quantity of } CO_2 [t] - \text{energy used} [MWh] \times EF \left[t \frac{CO_2eq}{MWh} \right] - \text{auxiliary materials used} [t] \times EF \left[t \frac{CO_2eq}{t} \right]}{\text{produced quantity of fuel} [t] \times \text{lower heating value fuel} \left[\frac{GJ}{t} \right]}$$

7.10 Emissions savings from CO₂ capture and replacement (e_{ccr})

7.10.1 Emission savings from CO₂ capture and replacement (e_{ccr}) shall be related directly to the production of **biomass fuel** they are attributed to, and shall be limited to emissions avoided through the capture of CO₂ of which the carbon originates from **biomass** and which is used to replace fossil-derived CO₂ in production of commercial products and services. (RED II - Annex VI, Part B. No15)

7.10.2 By default, the emission savings from CO₂ capture and replacement e_{ccr} is set to 0.

7.10.3 If e_{ccr} is calculated, the auditors shall verify that its estimate is limited to the emissions avoided through the capture of CO₂ of which the carbon originates from **biomass** and which is used to replace fossil-derived CO₂. It requires the following information:

- a) the purpose for which the captured CO₂ is used
- b) the origin of the CO₂ that is replaced *
- c) the origin of the CO₂ that is captured
- d) information on emissions due to capturing and processing of CO₂

Note: ***Organisations** using captured CO₂ may state how the CO₂ that is replaced was generated previously and declare, in writing, that due to the replacement emissions are avoided. It is to be considered sufficient to verify compliance with the requirements of Directive (EU) 2018/2011 and the avoidance of emissions.

7.10.4 E_{ccr} shall be related directly to the production of **biomass fuel** they are attributed to, and shall be limited to emissions avoided through the capture of CO₂ of which the carbon originates from **biomass**, and which is used to replace fossil-derived CO₂ in production of commercial products and services.

7.10.5 The following formula shall be used to calculate e_{ccr} :

$$e_{ccr} \left[\frac{gCO_2eq}{MJ_{fuel}} \right] = \frac{\text{produced quantity of } CO_2[t] - \text{energy used}[MWh] \times EF \left[t \frac{CO_2eq}{MWh} \right] - \text{auxiliary materials used}[t] \times EF \left[t \frac{CO_2eq}{t} \right]}{\text{produced quantity of fuel } [t] \times \text{lower heating value fuel} \left[\frac{GJ}{t} \right]}$$

7.10.6 The emission saved must relate directly to the production of the biofuel they are attributed to. It means that all biofuels originating from the same process would need to be treated equally. If the CO₂ is not captured continuously, it might be appropriate to deviate from this approach and to attribute different amounts of savings to biofuel obtained from the same process. The **organisation** shall not allocate a higher amount of savings to a given batch of biofuel than the average amount of CO₂ captured per MJ of biofuel in a hypothetical process where the entire CO₂ stemming from the production process is captured. Capturing and processing of CO₂ has its own GHG emission footprint. Those emissions have to be taken into account in the calculation applying the appropriate emission factors for the energy consumed and the inputs used for capturing and processing of CO₂.

7.11 Allocation emissions

7.11.1 When processing intermediate products, the **organisation** shall apply the following formula to emissions from cultivation:

$$e_{ec} \text{intermediate product}_a \left[\frac{gCO_2eq}{Kg_{dry}} \right] = e_{ec} \text{feedstock}_a \left[\frac{gCO_2eq}{Kg_{dry}} \right] \times \text{feedstock factor}_a \times \text{allocation factor intermediate product}_a$$

where

$$\text{Allocation factor intermediate product}_a = \left[\frac{\text{energy in intermediate product}_a}{\text{energy in intermediate product and coproducts}} \right]$$

$$\text{Feedstock factor}_a = \left[\text{ratio of } kg_{dry} \text{ feedstock required to make } 1kg_{dry} \text{ intermediate product} \right]$$

where

$$\text{Energy in co-product [MJ]} = \text{yield}_{coproduct} [kg_{dry}] \times \text{lower calorific value}_{coproduct} [MJ/kg]$$

$$\text{Energy in intermediate product [MJ]} = \text{yield}_{intermediate product} [kg_{dry}] \times \text{lower calorific value}_{intermediate product} [MJ/kg]$$

Note: The energy is determined using the lower calorific value and the yield. The lower calorific value used in applying this rule must be that of the entire (co-) product (not the value for only the dry part of it). In many cases, however, notably in relation to nearly-dry products, the latter could give a result that is an adequate approximation. Because heat does not have a lower calorific value, no emissions can be allocated to it on this basis.

7.11.2 As mentioned in requirement 7.1.7, raw materials and interim products, information on GHG emissions has to be provided in the unit g CO₂eq /dry-ton feedstock or g CO₂eq /dry-ton intermediary product, respectively. To receive information on emissions per dry-ton feedstock the following formula has to be applied:

$$e_{ec} feedstock_a \left[\frac{gCO_2eq}{t_{dry}} \right] = \frac{e_{ec} feedstock_a \left[\frac{gCO_2eq}{t_{moist}} \right]}{(1 - moisture\ content)}$$

Note: The moisture content is based on the delivery details. If it is missing or not known, it is based on the maximum value allowed in the supply contract.

7.11.3 At the last processing step, the **organisation** shall convert the emission estimate into the unit CO₂eq /MJ of final biofuel. GHG emissions from the extraction or cultivation of raw materials e_{ec} are expressed in unit g CO₂eq /dry-ton of feedstock, the conversion to grams of CO₂ equivalent per MJ of fuel, g CO₂eq /MJ, shall be calculated as follows:

$$e_{ec} fuel_a \left[\frac{gCO_2eq}{MJ_{fuel}} \right] = \frac{e_{ec} feedstock_a \left[\frac{gCO_2eq}{t_{dry}} \right]}{LHV_a \left[\frac{MJ_{feedstock}}{t_{dry} feedstock} \right]} \times fuel\ feedstock\ factor_a \times allocation\ factor\ fuel_a$$

where

$$Allocation\ factor\ fuel_a = \left[\frac{Energy\ in\ fuel}{Energy\ fuel + Energy\ in\ coproducts} \right]$$

Fuel feedstock factor_a = [Ratio of MJ feedstock required to make 1 MJ fuel]

where

Energy in fuel [MJ] = yield_{fuel} [kg_{dry}] x lower calorific value_{main product} [MJ/kg]

Energy in co-product [MJ] = yield_{coproduct} [kg_{dry}] x lower calorific value_{coproduct} [MJ/kg]

Note 1: For the calculation of the feedstock factor, LHV values per dry ton should be applied while for the calculation of the allocation factor LHV values for wet **biomass** need to be used as this approach was also applied for the calculation of the **default values**.

7.11.4 The **organisation** shall also adjust the values for e_p , e_{td} and e_l . In case of e_p and e_{td} , the emissions from the relevant processing step must be added. Whenever **actual values** are calculated at each step of the chain of custody, the additional emissions from transport and/or processing shall be added to e_p and/or e_{td} , respectively. Whenever a processing step yields co-products, emissions shall be allocated as set out in the GHG emission calculation methodology.

7.11.5 Where a biomass fuel production process produces, in combination, the fuel for which emissions are being calculated and one or more other products ('co-products'), greenhouse gas emissions shall be divided between the fuel or its intermediate product and the co-products in proportion to their energy content (determined by lower heating value in the case of co-products other than electricity and heat). The greenhouse gas intensity of excess useful heat or excess electricity is the same as the greenhouse gas intensity of heat or electricity delivered to the biomass fuel production process and is determined from calculating the greenhouse gas intensity of all inputs and emissions, including the feedstock and CH₄ and N₂O emissions, to and from the cogeneration unit, boiler or other apparatus delivering heat or electricity to the biomass fuel production process. In the case of cogeneration of electricity and heat, the calculation is performed following point 7.12.2. Allocation of GHG emissions shall take place at every processing step in the supply chain where a co-product(s) is produced. The GHG emissions up to this processing step shall be distributed to the main product and the co-product proportional to their energy content and weight. GHG emissions downstream of the processing step (e.g., further downstream processing or transport & distribution) shall not be included in the allocation, as these emissions are not related to the co-product.

Note: An intermediate product is a product that is part of the process. A co-product is other product or products generated as final products, but not the primary final product.

7.11.6 The allocation shall include the emissions $e_{ec} + e_l + e_{sca}$ + those fractions of e_p , e_{td} , e_{ccs} and e_{ccr} that take place up to and including the process step at which a co-product is produced. If any allocation to co-products has taken place at an earlier process step in the life-cycle, the fraction of those emissions assigned in the last such process step to the intermediate fuel product shall be used for those purposes instead of the total of those emissions. **Wastes** and **residues**, including tree tops and branches, straw, husks, cobs and nut shells, and **residues** from processing, including crude glycerine (glycerine that is not refined) and bagasse, shall be considered to have zero life-cycle GHG emissions up to the process of collection of those materials irrespectively of whether they are processed to interim products before being transformed into the final product.

7.11.7 When heating and cooling are co-generated with electricity, emissions shall be allocated between heat and electricity, irrespectively if the heat is used for actual heating purposes or for cooling. This means that the GHG emissions must be separately allocated respectively. to electricity and heat according to plant resp. electrical efficiency (η_{el}) and heat efficiency (η_h) on the basis of exergy. This leads to "Saving Equation" (part. 7.13) expressing those respective allocated GHG emissions for electricity EC_{el} and heat EC_h .

Note: The useful part of the heat is found by multiplying its energy content with the Carnot efficiency, C_h , as follows mentioned in the part 7.12.2.

7.12 Calculation of GHG emissions from the production of heat and/or electricity from biomass fuels

7.12.1 GHG emissions from heating or electricity, produced from **biomass fuels**, EC , shall be expressed in terms of grams of CO₂ equivalent per MJ of final energy commodity (heat or electricity), $g_{CO_2eq/MJ}$.

7.12.2 GHG emissions from the use of **biomass fuels** in producing electricity, heating and cooling, including the energy conversion to electricity and/or heat or cooling produced, shall be calculated as follows:

a) For energy **installations** delivering only heat:

$$EC_h = \frac{E}{n_h}$$

b) For energy **installations** delivering only electricity:

$$EC_{el} = \frac{E}{n_{el}}$$

c) For the electricity or mechanical energy coming from energy **installations** delivering useful heat together with electricity and/or mechanical energy:

$$EC_{el} = \frac{E}{n_{el}} \left(\frac{C_{el} \times n_{el}}{C_{el} \times n_{el} + C_h \times n_h} \right)$$

where

$EC_{h,el}$ = Total greenhouse gas emissions from the final energy commodity.

E = Total greenhouse gas emissions of the fuel before end-conversion.

n_{el} = The electrical efficiency, defined as the annual electricity produced divided by the annual energy input, based on its energy content.

n_h = The heat efficiency, defined as the annual useful heat output divided by the annual energy input, based on its energy content.

- d) For the useful heat coming from energy **installations** delivering heat together with electricity and/or mechanical energy:

$$EC_h = \frac{E}{n_h} \left(\frac{C_h \times n_h}{C_{el} \times n_{el} + C_h \times n_h} \right)$$

where

$EC_{h,el}$ = Total greenhouse gas emissions from the final energy commodity.

E = Total greenhouse gas emissions of the fuel before end-conversion.

n_{el} = The electrical efficiency, defined as the annual electricity produced divided by the annual energy input, based on its energy content.

n_h = The heat efficiency, defined as the annual useful heat output divided by the annual energy input, based on its energy content.

C_{el} = Fraction of exergy in the electricity, and/or mechanical energy, set to 100 % ($C_{el} = 1$).

C_h = Carnot efficiency (fraction of exergy in the useful heat).

Where a cogeneration unit – providing heat and/or electricity to a biomass fuel production process for which emissions are being calculated – produces excess electricity and/or excess useful heat, the greenhouse gas emissions shall be divided between the electricity and the useful heat according to the temperature of the heat (which reflects the usefulness (utility) of the heat). The useful part of the heat is found by multiplying its energy content with the Carnot efficiency, C_h , calculated as follows:

$$C_h = \frac{T_h - T_0}{T_h}$$

where

T_h = Temperature, measured in absolute temperature (kelvin) of the useful heat at point of delivery.

T_0 = Temperature of surroundings, set at 273,15 kelvin (equal to 0 °C).

If the excess heat is exported for heating of buildings, at a temperature below 150 °C (423,15 kelvin), C_h can alternatively be defined as follows:

C_h = Carnot efficiency in heat at 150 °C (423,15 kelvin), which is: 0,3546

Note: For the purposes of that calculation, the following definitions apply:

- e) cogeneration' shall mean the simultaneous generation in one process of thermal energy and electricity and/or mechanical energy;
- f) useful heat' shall mean heat generated to satisfy an economical justifiable demand for heat, for heating or cooling purposes;
- g) economically justifiable demand' shall mean the demand that does not exceed the needs for heat or cooling and which would otherwise be satisfied at market conditions.

7.13 Calculations of GHG emissions saving from biomass fuels compared to fossil fuels

7.13.1 The **organisation** shall calculate “GHG emissions savings from heat and cooling, and electricity being generated from **biomass fuels**” as follows:

$$Saving = \left(ECF_{h\&c,el} - \frac{ECB_{h\&c,el}}{ECF_{h\&c,el}} \right)$$

where

$ECB_{h\&c,el}$ = total emissions from the heat or electricity

$ECF_{h\&c,el}$ = total emissions from the fossil fuel comparator for useful heat or electricity

Note: The value for the reference fossil fuel $ECF_{(el)}$ may be different:

- a) For **biomass fuels** used for the production of electricity, $EC_{F(el)} = 183$ g CO_{2eq}/MJ electricity or $EC_{F(el)} = 212$ g CO_{2eq}/MJ electricity for the outermost regions.
- b) For **biomass fuels** used for the production of useful heat, as well as for the production of heating and/or cooling, $EC_{F(h)} = 80$ g CO_{2eq}/MJ heat.
- c) For **biomass fuels** used for the production of useful heat, in which a direct physical substitution of coal can be demonstrated, $EC_{F(h)} = 124$ g CO_{2eq}/MJ heat.

Appendix 1 (informative): RED II compliant - PEFC Declaration template

This document is to be sent to customers concerned by the RED II Directive

SUPPLIER		CLIENT	
1	Name of supplier	5	Customer name and address
2	Address	6	Delivery period
3	Company registration number		from dd/mm/YYYY to dd/mm/YYYY
4	PEFC COC RED II code		

INFORMATION TO CERTIFY SUSTAINABILITY and GHG¹ calculation data of COMPANY'S DELIVERIES
one attestation per customer, and per type of biomass meeting the same criteria

7. TYPE, NATURE, AND QUANTITY OF BIOMASS FEEDSTOCK (the batch must be homogenous)					
	7.1 Type of biomass feedstock	7.2 Quantity (tons)	7.3 Quantity in percentage ²	7.4 Country of origin ³	7.5 Transportation distance (between 1 km and 500 km, between 500 km and 2500 km, between 2 500km and 10000km or > 10000 km)
Forest biomass	Forest biomass		...%		
Related products of processing industries	Ligno-cellulosic primary processing residues (eligible TOF)				
	Ligno-cellulosic primary processing residues (residues from sawmill)		...%		
	Ligno-cellulosic secondary processing residues		...%		
Waste	Ligno-cellulosic Waste		...%		

8. Type of biomass fuel	Wood chips				
	Wood pellets or briquettes				
	Other				
9.	Total quantity delivered				_ _ _ _ _ _ _ Tons delivered
10.	of which quantity « RED II compliant – PEFC »				_ _ _ _ _ _ _ Tons delivered

1/ GHG: Greenhouse Gas

2/ Specify the % in case of feedstock mixed to produce biomass fuel

3/ Country which the wood has been harvested or where the residue or waste has been produced

SIGNATURE and DATE

Appendix 2 (normative): Typical and default values of greenhouse gas emissions savings for biomass fuels if produced with no net-carbon emissions from land-use change

Table 3: Typical and default values of greenhouse gas emissions savings for biomass fuels if produced with no net-carbon emissions from land-use change – wood chips

WOODCHIPS			
Biomass fuel production system	Transport distance	Greenhouse gas emissions savings – default value	
		Heat	Electricity
Woodchips from forest residues	1 to 500 km	91 %	87 %
	500 to 2500 km	87 %	81 %
	2500 to 10000 km	78 %	67 %
	Above 10000 km	60 %	41 %
Woodchips from short rotation coppice (Eucalyptus)	2500 to 10000 km	73 %	60 %
Woodchips from short rotation coppice (Poplar – Fertilised)	1 to 500 km	87 %	81 %
	500 to 2500 km	84 %	76 %
	2500 to 10000 km	74 %	62 %
	Above 10000 km	57 %	35 %
Woodchips from short rotation coppice (Poplar – No fertilisation)	1 to 500 km	90 %	85 %
	500 to 2500 km	86 %	79 %
	2500 to 10000 km	77 %	65 %
	Above 10000 km	59 %	39 %
Woodchips from stemwood	1 to 500 km	92 %	88 %
	500 to 2500 km	88 %	82 %
	2500 to 10000 km	79 %	68 %
	Above 10000 km	61 %	42 %
Woodchips from industry residues	1 to 500 km	93 %	90 %
	500 to 2500 km	90 %	85 %
	2500 to 10000 km	80 %	71 %
	Above 10000 km	63 %	44 %

Table 4: Typical and default values of greenhouse gas emissions savings for biomass fuels if produced with no net-carbon emissions from land-use change – wood pellets

WOOD PELLETS (*)				
Biomass fuel production system		Transport distance	Greenhouse gas emissions savings – default value	
			Heat	Electricity
Wood briquettes or pellets from forest residues	Case 1	1 to 500 km	49 %	24 %
		500 to 2500 km	49 %	25 %
		2500 to 10000 km	47 %	21 %
		Above 10 000 km	40 %	11 %
	Case 2a	1 to 500 km	72 %	59 %
		500 to 2 500 km	72 %	59 %
		2500 to 10000 km	70 %	55 %
		Above 10000 km	63 %	45 %
	Case 3a	1 to 500 km	90 %	85 %
		500 to 2500 km	90 %	86 %
		2500 to 10000 km	88 %	81 %
		Above 10000 km	81 %	72 %
Wood briquettes or pellets from short rotation coppice (Eucalyptus)	Case 1	2500 to 10000 km	43 %	15 %
	Case 2a	2500 to 10000 km	66 %	49 %
	Case 3a	2500 to 10000 km	83 %	75 %
Wood briquettes or pellets from short rotation coppice (Poplar – Fertilised)	Case 1	1 to 500 km	46 %	20 %
		500 to 10000 km	44 %	16 %
		Above 10000 km	37 %	7 %
	Case 2a	1 to 500 km	69 %	54 %
		500 to 10000 km	67 %	50 %
		Above 10000 km	60 %	41 %
	Case 3a	1 to 500 km	87 %	81 %
		500 to 10000 km	84 %	77 %
		Above 10000 km	78 %	67 %

Wood briquettes or pellets from short rotation coppice (Poplar – No fertilisation)	Case 1	1 to 500 km	48 %	23 %
		500 to 10000 km	46 %	20 %
		Above 10000 km	40 %	10 %
	Case 2a	1 to 500 km	72 %	58 %
		500 to 10000 km	69 %	54 %
		Above 10000 km	63 %	45 %
	Case 3a	1 to 500 km	90 %	85 %
		500 to 10000 km	87 %	81 %
		Above 10000 km	81 %	71 %
Stemwood	Case 1	1 to 500 km	49 %	24 %
		500 to 2500 km	49 %	25 %
		2500 to 10000 km	47 %	21 %
		Above 10000 km	40 %	11 %
	Case 2a	1 to 500 km	73 %	60 %
		500 to 2500 km	73 %	60 %
		2500 to 10000 km	70 %	56 %
		Above 10000 km	64 %	46 %
	Case 3a	1 to 500 km	91 %	86 %
		500 to 2500 km	91 %	87 %
		2500 to 10000 km	88 %	83 %
		Above 10000 km	82 %	73 %
Wood briquettes or pellets from wood industry residues	Case 1	1 to 500 km	69 %	55 %
		500 to 2500 km	70 %	55 %
		2500 to 10000 km	67 %	51 %
		Above 10000 km	61 %	42 %
	Case 2a	1 to 500 km	84 %	76 %
		500 to 2500 km	84 %	77 %
		2500 to 10000 km	82 %	73 %
		Above 10000 km	75 %	63 %
	Case 3a	1 to 500 km	94 %	91 %
		500 to 2500 km	94 %	92 %
		2500 to 10000 km	92 %	88 %
		Above 10000 km	85 %	78 %

Source: REDII - Annex VI, Part A. Version: 21.12.2018.

Note 1: Case 1 refers to processes in which a natural gas boiler is used to provide the process heat to the pellet mill. Electricity for the pellet mill is supplied from the grid;

Case 2a refers to processes in which a woodchips boiler, fed with pre-dried chips, is used to provide process heat. Electricity for the pellet mill is supplied from the grid;

Case 3a refers to processes in which a CHP, fed with pre-dried woodchips, is used to provide electricity and heat to the pellet mill.

Note 2: If the later **organisation** uses a forest and tree based biomass fuel mix, it will need to calculate the consignment basis to complete the GHG emission savings of its **installation**, according to the requirements on chapter 4.

Appendix 3 (normative): Disaggregated default values for biomass fuels

Table 5: Disaggregated default values for biomass fuels – Woodchips

WOODCHIPS						
Biomass fuel production system	Transport distance	Greenhouse gas emissions – default value (g CO ₂ eq/MJ)				
		Cultivation	Cultivation	Processing	Transport	Non-CO ₂ emissions from the fuel in use
Wood chips from forest residues	1 to 500 km	0,0	0,0	1,9	3,6	0,5
	500 to 2500 km	0,0	0,0	1,9	6,2	0,5
	2500 to 10000 km	0,0	0,0	1,9	12,6	0,5
	Above 10000 km	0,0	0,0	1,9	24,6	0,5
Wood chips from SRC (Eucalyptus)	2500 to 10000 km	4,4	4,4	0,0	13,2	0,5
Wood chips from SRC (Poplar – fertilised)	1 to 500 km	3,9	3,9	0,0	4,2	0,5
	500 to 2500 km	3,9	3,9	0,0	6,8	0,5
	2500 to 10000 km	3,9	3,9	0,0	13,2	0,5
	Above 10000 km	3,9	3,9	0,0	25,2	0,5
Wood chips from SRC (Poplar – Not fertilised)	1 to 500 km	2,2	2,2	0,0	4,2	0,5
	500 to 2500 km	2,2	2,2	0,0	6,8	0,5
	2500 to 10000 km	2,2	2,2	0,0	13,2	0,5
	Above 10000 km	2,2	2,2	0,0	25,2	0,5
Wood chips from stemwood	1 to 500 km	1,1	1,1	0,4	3,6	0,5
	500 to 2500 km	1,1	1,1	0,4	6,2	0,5
	2500 to 10000 km	1,1	1,1	0,4	12,6	0,5
	Above 10000 km	1,1	1,1	0,4	24,6	0,5
Wood chips from wood industry residues	1 to 500 km	0,0	0,0	0,4	3,6	0,5
	500 to 2500 km	0,0	0,0	0,4	6,2	0,5
	2500 to 10000 km	0,0	0,0	0,4	12,6	0,5
	Above 10000 km	0,0	0,0	0,4	24,6	0,5

Table 6: Disaggregated default values for biomass fuels – Woods Pellets

WOODS PELLETS							
Biomass fuel production system	Transport distance	Greenhouse gas emissions – default value (g CO ₂ eq/MJ)					
		Cultivation	Processing	Cultivation	Processing	Transport & distribution	Non-CO ₂ emissions from the fuel in use
Wood briquettes or pellets from forest residues (case 1)	1 to 500 km	0,0	25,8	0,0	30,9	3,5	0,3
	500 to 2500 km	0,0	25,8	0,0	30,9	3,3	0,3
	2500 to 10000 km	0,0	25,8	0,0	30,9	5,2	0,3
	Above 10000 km	0,0	25,8	0,0	30,9	9,5	0,3
Wood briquettes or pellets from forest residues (case 2a)	1 to 500 km	0,0	12,5	0,0	15,0	3,6	0,3
	500 to 2500 km	0,0	12,5	0,0	15,0	3,5	0,3
	2500 to 10000 km	0,0	12,5	0,0	15,0	5,3	0,3
	Above 10000 km	0,0	12,5	0,0	15,0	9,8	0,3
Wood briquettes or pellets from forest residues (case 3a)	1 to 500 km	0,0	2,4	0,0	2,8	3,6	0,3
	500 to 2500 km	0,0	2,4	0,0	2,8	3,5	0,3
	2500 to 10000 km	0,0	2,4	0,0	2,8	5,3	0,3
	Above 10000 km	0,0	2,4	0,0	2,8	9,8	0,3
Wood briquettes from short rotation coppice (Eucalyptus – case 1)	2 500 to 10000 km	3,9	24,5	3,9	29,4	5,2	0,3

Wood briquettes from short rotation coppice (Eucalyptus – case 2a)	2500 to 10000 km	5,0	10,6	5,0	12,7	5,3	0,3
Wood briquettes from short rotation coppice (Eucalyptus – case 3a)	2500 to 10000 km	5,3	0,3	5,3	0,4	5,3	0,3
Wood briquettes from short rotation coppice (Poplar – Fertilised – case 1)	1 to 500 km	3,4	24,5	3,4	29,4	3,5	0,3
	500 to 10000 km	3,4	24,5	3,4	29,4	5,2	0,3
	Above 10000 km	3,4	24,5	3,4	29,4	9,5	0,3
Wood briquettes from short rotation coppice (Poplar – Fertilised – case 2a)	1 to 500 km	4,4	10,6	4,4	12,7	3,6	0,3
	500 to 10000 km	4,4	10,6	4,4	12,7	5,3	0,3
	Above 10000 km	4,4	10,6	4,4	12,7	9,8	0,3
Wood briquettes from short rotation coppice (Poplar – Fertilised – case 3a)	1 to 500 km	4,6	0,3	4,6	0,4	3,6	0,3
	500 to 10000 km	4,6	0,3	4,6	0,4	5,3	0,3
	Above 10000 km	4,6	0,3	4,6	0,4	9,8	0,3
Wood briquettes from short rotation coppice (Poplar – no fertilisation – case 1)	1 to 500 km	2,0	24,5	2,0	29,4	3,5	0,3
	500 to 2500 km	2,0	24,5	2,0	29,4	5,2	0,3
	2500 to 10000 km	2,0	24,5	2,0	29,4	9,5	0,3
Wood briquettes	1 to 500 km	2,5	10,6	2,5	12,7	3,6	0,3

from short rotation coppice (Poplar – no fertilisation – case 2a)	500 to 10000 km	2,5	10,6	2,5	12,7	5,3	0,3
	Above 10000 km	2,5	10,6	2,5	12,7	9,8	0,3
Wood briquettes from short rotation coppice (Poplar – no fertilisation– case 3a)	1 to 500 km	2,6	0,3	2,6	0,4	3,6	0,3
	500 to 10000 km	2,6	0,3	2,6	0,4	5,3	0,3
	Above 10000 km	2,6	0,3	2,6	0,4	9,8	0,3
Wood briquettes or pellets from stemwood (case 1)	1 to 500 km	1,1	24,8	1,1	29,8	3,5	0,3
	500 to 2500 km	1,1	24,8	1,1	29,8	3,3	0,3
	2500 to 10000 km	1,1	24,8	1,1	29,8	5,2	0,3
	Above 10000 km	1,1	24,8	1,1	29,8	9,5	0,3
Wood briquettes or pellets from stemwood (case 2a)	1 to 500 km	1,4	11,0	1,4	13,2	3,6	0,3
	500 to 2500 km	1,4	11,0	1,4	13,2	3,5	0,3
	2500 to 10000 km	1,4	11,0	1,4	13,2	5,3	0,3
	Above 10000 km	1,4	11,0	1,4	13,2	9,8	0,3
Wood briquettes or pellets from stemwood (case 3a)	1 to 500 km	1,4	0,8	1,4	0,9	3,6	0,3
	500 to 2500 km	1,4	0,8	1,4	0,9	3,5	0,3
	2500 to 10000 km	1,4	0,8	1,4	0,9	5,3	0,3
	Above 10000 km	1,4	0,8	1,4	0,9	9,8	0,3
Wood briquettes or pellets from wood	1 to 500 km	0,0	14,3	0,0	17,2	3,3	0,3
	500 to 2500 km	0,0	14,3	0,0	17,2	3,2	0,3

industry residues (case 1)	2500 to 10000 km	0,0	14,3	0,0	17,2	5,0	0,3
	Above 10000 km	0,0	14,3	0,0	17,2	9,2	0,3
Wood briquettes or pellets from wood industry residues (case 2a)	1 to 500 km	0,0	6,0	0,0	7,2	3,4	0,3
	500 to 2500 km	0,0	6,0	0,0	7,2	3,3	0,3
	2500 to 10000 km	0,0	6,0	0,0	7,2	5,1	0,3
	Above 10000 km	0,0	6,0	0,0	7,2	9,3	0,3
Wood briquettes or pellets from wood industry residues (case 3a)	1 to 500 km	0,0	0,2	0,0	0,3	3,4	0,3
	500 to 2500 km	0,0	0,2	0,0	0,3	3,3	0,3
	2500 to 10000 km	0,0	0,2	0,0	0,3	5,1	0,3
	Above 10000 km	0,0	0,2	0,0	0,3	9,3	0,3

Source: REDII - Annex VI, Part C. Version: 21.12.2018.

Appendix 4 (informative): Sources of information

This appendix is intended to provide an overview of the information for compliance with the harvesting criteria at the forest certified area level.

Table 7: Overview of the information and its sources for compliance with harvesting criteria at the forest sourcing area level

Criteria	Indicator	Sources of information
Forest regeneration	Certified area	Forest management plans
Forest regeneration	Type of harvesting operations from which forest biomass results (final felling, selective logging, thinnings, etc.) Quality and quantity of next generation forest resources	Forest management plans Records or reports on forest regeneration
Protected area	Presence of designated areas for nature protection, including wetlands and peatlands	IUCN maintains the World Database on Protected Areas (WDPA) Other international networks of designated areas e.g., the UNESCO Biosphere Reserves
Protected area	Permissions for biomass removal in the protected areas	Harvesting permission issued by the relevant competent authority Alternatively, proof of compliance with relevant legislation is provided through operational reports/harvest protocols
Protected area	Implementation of plans/measures in the protected areas	Operational reports describe compliance measures undertaken in the respective areas, obtained via field-inspections with an agent of the relevant competent authority, or The confirmations are implemented by second or third party and thereafter endorsed by the competent authority. Second party audits will require field-inspections whenever the evidence provided is not sufficient to ensure compliance with the RED II sustainability criteria. As part of the third party, the external auditor may conduct a field visit in a sample basis, and whenever the auditor considers that the evidence provided is not sufficient.

Soil quality and biodiversity	Biomass includes stumps or roots	Operational post-harvest reports confirm that stumps or roots were not harvested in the certified area
Soil quality and biodiversity	Existence of poor or vulnerable soils in the forest certified area	FAO/UNESCO Soil Map of the World Harmonized World Soil Database – FAO National or regional soil maps Identification of poor or vulnerable soils in forest management plans
Soil quality and biodiversity	Harvesting on poor or vulnerable soils is implemented according to requirements of logging permission	Post-harvest report issued or approved by the competent authority
Soil quality and biodiversity	Impacts on soil quality are minimised during and after harvesting	Forest management plans/operational reports/harvest protocols could include a "checklist" for the assessment of potential impacts as well as an assessment of measures to minimise such at operational level Operational reports created during or after harvest show proof that precautionary measures have been implemented regarding soil protection and include dated and geo-tagged pictures before-and after- the intervention or written description of impacts on logging trails and damages on the remaining stand Operational reports/harvest protocols confirm that local best practice guidelines or relevant legislation regarding soil protection during harvesting operations are complied with (i.e. chosen harvesting system is justified in respect of soil type and slope)
Soil quality and biodiversity	Biodiversity and habitat features are assessed and specified	Forest management plans Operational reports Pre-harvest inventory Regional biodiversity assessments
Soil quality and biodiversity	Required or recommended amounts of deadwood are known	Applicable legislation or regulation Regionally applicable best practices

		Scientific recommendations
Soil quality and biodiversity	Deadwood amounts are according requirements or best practice recommendation	Harvesting protocols Operational reports Pre-harvest inventory Post-harvest assessments
Soil quality and biodiversity	Preventive and protective measures are taken to protect biodiversity during harvesting operations	Harvesting protocols Operational reports Post-harvest assessments
Long-term production capacity	Sustainable harvest levels on forest available for wood supply	Regional data for net annual increment is published by national or regional forest inventories but can also be calculated on the basis of forest growth models specifically for the forest certified area Regional data for annual harvested timber amounts can be obtained from national or regional forest inventories, or from forest authorities
Long-term production capacity	Harvest amounts does not exceed net annual increments	Permits or documents including reports of the relevant competent forest authority Specific permits issued by the relevant competent authority allow these temporarily higher harvest levels, for one of the reasons as indicated in 6.2.5.2

Appendix 5 (informative): Gap analysis between the PEFC Benchmark standard PEFC ST 1003, Sustainable Forest Management, and the additional SFM requirements to be implemented for Level B evidence

The following table maps the requirements from the PEFC Benchmark Standard PEFC ST 1003, Sustainable Forest Management, with the interpretations issued to those requirements to align with RED II requirements, which **organisations** acting as the **first gathering point** shall require PEFC SFM certified forest biomass producers to implement and provide the required information, to assess compliance with RED II requirements at **Level B**. The additional SFM requirements are already specified under 6.2 and this table is just for information purposes. The following table is to be used together with Appendix 4 that outlines sources of information used in conformity evaluation.

Table 8: Gap analysis between the requirements from the PEFC Benchmark Standard PEFC ST 1003, Sustainable Forest Management, and the additional SFM requirements to be implemented for Level B evidence

Requirement of PEFC ST 1003:2018	Interpretation and add-on for RED II compliance	RED II requirement (as of IR 2022/996)
General requirements		
	6.2.1.1 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point accurate, up-to-date, and verifiable evidence of the spatial boundaries of the certified area by means of geographical coordinates or parcels.	(a) The spatial boundaries of the sourcing area for which compliance needs to be demonstrated, and on which management systems referred to in point (b) apply, including by means of geographical coordinates or parcels.
Legality of harvest operations <i>“(i) the legality of harvesting operations”</i>		
<p>6.3.1.1 The standard requires that the organisation shall identify and have access to the legislation applicable to its forest management and determine how these compliance obligations apply to the organisation.</p> <p>Note: For a country which has signed a FLEGT Voluntary Partnership Agreement (VPA) between the European Union and the producing country, the “legislation applicable to forest management” is defined by the VPA agreement.</p> <p>6.3.1.2 The standard requires that the organisation shall comply with applicable local, national and</p>	<p>6.2.2.1 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point any evidence as requested by the organisation certified against PEFC ST 5002 to prove compliance of harvesting with Regulation (EU) No 995/2010 of the European Parliament and of the Council (usually known as: EUTR)</p> <p>Note: Mainly, PEFC SFM certified organisations need to provide the organisation</p>	<p>Management systems applicable to the sourcing area ensuring:</p> <p>(i) the legality of harvesting operations, which shall be proven by providing evidence of the compliance of harvesting with the due diligence system defined in Article 6 of Regulation (EU) No 995/2010 of the European Parliament and of the Council.</p>

<p>international legislation on forest management, including but not limited to forest management practices; nature and environmental protection; protected and endangered species; property, tenure and land-use rights for indigenous peoples, local communities or other affected stakeholders; health, labour and safety issues; anti-corruption and the payment of applicable royalties and taxes.</p>	<p>with sufficient information to implement a due diligence system per Article 6 of the above referred legislation (EUTR).</p>	
<p>6.3.1.4 The standard requires that measures shall be implemented to address protection of the forest from unauthorised activities such as illegal logging, illegal land use, illegally initiated fires, and other illegal activities.</p>		
<p>Forest regeneration of harvested areas <i>“(ii) forest regeneration of harvested areas”</i></p>		
<p>8.4.4 The standard requires that successful regeneration shall be ensured through natural regeneration or planting that is adequate to ensure the quantity and quality of the forest resources.</p>	<p>6.2.3.1 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point evidence (e.g., forest management plans, operational protocols, environmental impact assessments, and results of relevant compliance audits and inspections) after harvesting operations to ensure that the harvested plots are regenerated in an appropriate manner after harvesting operations.</p> <p>6.2.3.2 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point evidence that regeneration is implemented within 10 years after harvesting activities, unless otherwise required by national legislation.</p>	<p>(ii) that forest regeneration is carried out in a manner that at least maintains the quality and quantity of the harvested forest areas, which may be proven by providing evidence of the establishment of a new forest in the same area within a maximum of ten years after the harvesting.</p>

Areas designated for nature conservation purposes are not negatively affected

“(iii) that areas designated by international or national law or by the relevant competent authority for nature protection purposes, including in wetlands and peatlands, are protected unless evidence is provided that the harvesting of that raw material does not interfere with those nature protection purposes”

8.4.2 The standard requires that inventory, mapping and planning of forest resources shall identify, protect, conserve or set aside ecologically important forest areas.

Note: This does not prohibit forest management activities that do not damage the important ecologic values of those biotopes.

6.2.4.1 PEFC SFM certified organisations shall provide the organisation acting as the first gathering point with evidence to ensure that inventory, mapping, and planning of forest resources and harvesting operations identify, protect, conserve, or set aside areas designated by international or national law, or by the relevant competent authority, for nature protection purposes, including in wetlands and peatlands.

Note: Harvesting in those areas is not generally prohibited. Where forestry operations have proven documentation on meeting all the requirements to maintain conservation purposes, harvesting could be legitimised.

6.2.4.2 PEFC SFM certified organisations shall, in the case of timber harvesting on these lands, provide to the organisation acting as the first gathering point the a harvesting permit issued by the relevant competent authority (e.g., in the management plan) and evidence of compliance with the relevant legislation described in operational reports or harvesting protocols (e.g., in the timber sale contract) and the result of relevant compliance audits and inspections (e.g., PEFC SFM audit report).

(iii) that forest biomass does not originate from areas designated by international or national law or by relevant competent authority for nature protection, including in wetlands and peatlands, unless there is evidence that the harvesting of the raw material does not interfere with the protection objectives of the designated areas. [...]

Maintenance of soil quality and of biodiversity

“(iv) that harvesting is carried out considering the maintenance of soil quality and biodiversity with the aim of minimising negative impacts”

<p>8.4.1 The standard requires that management planning shall aim to maintain, conserve or enhance biodiversity on landscape, ecosystem, species and genetic levels.</p> <p>8.4.10 The standard requires that tending and harvesting operations shall be conducted in a way that does not cause lasting damage to ecosystems. Wherever possible, practical measures shall be taken to maintain or improve biological diversity.</p> <p>8.5.3 The standard requires that special care shall be given to forestry operations on sensitive soils and erosion-prone areas as well as in areas where operations might lead to excessive erosion of soil into watercourses. Techniques applied and the machinery used shall be suitable for such areas. Special measures shall be taken to minimise the pressure of animal populations on these areas.</p> <p>8.3.3 The standard requires that management, harvesting and regeneration operations shall be carried out at a time, and in a way, that does not reduce the productive capacity of the site, for example by avoiding damage to soil and retained stands and trees.</p>	<p>6.2.5.1 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point evidence of soil types check, identification of sensitive areas in terms of soil quality and biodiversity and assessment of potential risks with forest biomass harvesting in advance.</p> <p>Note 1: This can be done, e.g., on the basis of soil maps, soil sensitivity maps, or through the provision of detailed field inventory data.</p> <p>Note 2: Biodiversity also includes habitat features.</p> <p>6.2.5.3 Large clear-cuts shall be minimised except in cases where it is temporarily justified due to documented forest pests, storms or other natural disturbances.</p>	<p>(iv) that forest harvesting is carried out in a way that aims at least at preventing negative impacts on soil quality and biodiversity. This may be proven by providing evidence that the relevant risks associated with the harvesting of forest biomass for energy production have been identified in advance; and that, appropriate mitigation actions have been implemented such as the following:</p>
<p>8.1.4 The standard requires that forest conversion shall not occur unless in justified circumstances where the conversion:</p> <ul style="list-style-type: none"> a) is in compliance with national and regional policy and legislation applicable for land use and forest management and is a result of national 	<p>6.2.5.2 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point evidence that no primary forest or areas designated by international or national law or relevant competent authority for nature protection, including wetlands and peatlands are</p>	<p>(1) primary forests and areas protected under 1 (b) (iii) are not degraded to or replaced by forest plantation;</p>

<p>or regional land-use planning governed by a governmental or other official authority including consultation with affected stakeholders; and</p> <p>b) entails a small proportion (no greater than 5 %) of forest type within the certified area; and</p> <p>c) does not have negative impacts on ecologically important forest areas, culturally and socially</p> <p>d) significant areas, or other protected areas; and</p> <p>e) does not destroy areas of significantly high carbon stock; and</p> <p>f) makes a contribution to long-term conservation, economic, and social benefits.</p>	<p>degraded to or replaced by forest plantations.</p> <p>Note: See also requirement 6.2.5.3, where it says that large clear-cuts shall be minimised except in cases where it is temporarily justified due to documented forest pests, storms, or other natural disturbances.</p>	
	<p>6.2.5.7 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point evidence that harvesting of stumps or roots is minimised.</p>	<p>(2) harvesting of stumps and roots is minimised;</p>
<p>8.5.3 The standard requires that special care shall be given to forestry operations on sensitive soils and erosion-prone areas as well as in areas where operations might lead to excessive erosion of soil into watercourses. Techniques applied and the machinery used shall be suitable for such areas. Special measures shall be taken to minimise the pressure of animal populations on these areas.</p>	<p>6.2.5.4 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point evidence that they do not conduct forest biomass harvesting in poor or vulnerable soils, unless in compliance with 6.2.5.5.</p> <p>Note: Vulnerable soils can be identified on FAO/UNESCO Soil Map of the World 34, Harmonized World Soil Database – FAO 35, and national or regional soil maps.</p> <p>6.2.5.5 Forest biomass may be exceptionally extracted from poor and vulnerable</p>	<p>(3) no harvesting is carried out on vulnerable soils;</p>

	soils under explicit permission from the competent authority. If biomass comes from poor or vulnerable sources, harvesting shall be implemented according to the requirements of logging permission provided by a competent authority.	
8.2.4 The standard requires that appropriate forest management practices such as reforestation and afforestation with tree species and provenances that are suited to the site conditions or the use of tending, harvesting and transport techniques that minimise tree and/or soil damages shall be applied.	<p>6.2.5.6 PEFC SFM certified organisations shall provide to the organisation acting as the first gathering point evidence that harvesting is carried out through logging systems to prevent degradation of soil quality and soil compensation.</p> <p>6.2.5.1 PEFC SFM certified organisations shall provide to the organisations acting as first gathering point evidence of soil types checks, identification of sensitive areas in terms of soil quality and biodiversity and assessment of potential risks with forest biomass harvesting in advance.</p> <p>Note 1: This can be done, e.g., on the basis of soil maps, soil sensitivity maps by the organisation or supplier, or through the provision of detailed field inventory data.</p> <p>Note 2: Biodiversity also includes habitat features.</p>	<p>(4) harvesting is carried out through logging systems that minimise impacts on soil quality, including soil compaction;</p> <p>(5) harvesting is carried out in a way that minimises impacts on biodiversity features and habitats, including plants and animals protected under international or national legislation;</p>
8.4.13 The standard requires that standing and fallen deadwood, hollow trees, old groves and rare tree species shall be left in quantities and distribution necessary to safeguard biological diversity, taking into account the potential effect on the health and stability of forests and on surrounding ecosystems.	6.2.5.8 PEFC SFM certified organisations shall provide to the first gathering point evidence that required or recommended amounts of deadwood are known and respected, and biodiversity is protected during harvesting operations.	(6) a locally-appropriate quantity and assortments of deadwood is left in the forest; and

	<p>6.2.5.3 Large clear-cuts shall be minimised except in cases where it is temporarily justified due to documented forest pests, storms or other natural disturbances.</p>	<p>(7) large clear-cuts are minimised except in cases where it is temporarily justified due to documented forest pests, storms or other natural disturbances.</p>
<p>Harvesting maintains or improves the long-term production capacity of forests</p> <p><i>“(v) that harvesting maintains or improves the long-term production capacity of the forest.”</i></p>		
<p>6.2.3 The standard requires that management plans shall include at least a description of the current forest management unit, long-term objectives, and the average annual allowable cut, including its justification.</p>	<p>6.2.6.1 PEFC SFM certified organisations shall provide to the organisation acting as first gathering point evidence that management plans include a description of the forest management unit, long-term objectives, and the average annual allowable cut, including its justification, and approximated annual increment to ensure sustainable harvest levels of the sourcing area covered by the certificate.</p> <p>6.2.6.2 PEFC SFM certified organisations shall provide to the organisation acting as first gathering point evidence that they do not exceed the annual allowable cut of timber, except there is proven evidence on:</p> <ul style="list-style-type: none"> - restructuring of the age structure - habitat management, e.g., for biodiversity - as a response to diseases, pests, storm or other officially accepted and well-justified reasons, e.g., natural disturbances 	<p>(v) the harvest maintains or improves the forest’s long-term production capacity. This may be proven by providing evidence that the annual fellings do not exceed the net annual increment in the relevant sourcing area on average within the ten year period prior to the harvesting intervention, unless different amounts are duly justified in order to enhance the future production capacity of the forest; or because of documented forest pests, storms or other natural disturbance. That may be proven by using public or private forest inventory data.</p>

Appendix 6 (informative): Sources of information and tools

This appendix is intended to provide an overview of sources of information and tools to demonstrate compliance with the LULUCF criteria at the forest certified area level.

Table 9: Checklist of possible tools to demonstrate LULUCF criteria compliance at forest sourcing area level

Name of tool	Description	Reference	URL
CO2FIX	Stand level simulation model, which quantifies the C stocks and fluxes in the aboveground biomass, belowground forest biomass, soil organic matter and the wood products chain	<ul style="list-style-type: none"> Masera et al. (2003)¹ Schelhaas et al. (2004)² 	http://dataservices.efi.int/casfor/models.htm
CBM-CFS3	Stand- and landscape-level modelling framework that simulates the dynamics of all forest carbon stocks required under the Kyoto Protocol (aboveground biomass, belowground biomass, litter, deadwood and soil organic carbon)	<ul style="list-style-type: none"> Kull et al. (2016)³ Kurz et al. (2009)⁴ 	https://www.nrcan.gc.ca/climate-change/climate-change-impacts-forests/carbon-accounting/carbon-budget-model/13107
YASSO soil carbon model	Dynamic model of the cycling of organic carbon in soil. Yasso calculates the amount of soil organic carbon, changes in the amount of soil organic carbon and heterotrophic soil respiration	<ul style="list-style-type: none"> Liski et al. (2005)⁵ 	https://en.ilmatieteenlaitos.fi/yasso
CASMOFOR	Tool to assess the amount of carbon sequestered in a forest system (aboveground biomass, belowground biomass, litter, deadwood and soil organic carbon)	<ul style="list-style-type: none"> Somogyi (2019)⁶ 	http://www.scientia.hu/casmoform/index.php
FORMIND	Individual tree-based vegetation model that simulates the growth of forests on the hectare scale. It allows to explore forest dynamics and forest structure	1.Köhler and Huth (1998) ⁷	http://formind.org/model/

Source: REDIBIO study, page 51

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Table 10: Potential data sources to demonstrate LULUCF criteria compliance at forest certified area level

Variable affecting carbon stock and sinks in forests	Potential source of information
Tree species composition	<ul style="list-style-type: none"> • Forest inventories • Forest management plan
Age structure	<ul style="list-style-type: none"> • Forest inventories • Forest management plan
Forest reproductive material used (provenance)	<ul style="list-style-type: none"> • Forest management plan
Growth rate of the selected tree species and forest reproductive material used	<ul style="list-style-type: none"> • Forest inventories • National or regional yield tables • Producer of seedlings or seeds used for regeneration
Basic wood density	<ul style="list-style-type: none"> • IPCC 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol
Carbon content	<ul style="list-style-type: none"> • IPCC 2013 Revised Supplementary Methods and Good Practice Arising from the Kyoto Protocol
Whole-tree biomass in relation growing stock volume	<ul style="list-style-type: none"> • IPCC 2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol

	<ul style="list-style-type: none"> • National GHG inventory report to UNFCCC • FAO method collection, see http://www.fao.org/3/w4095e/w4095e06.htm • Scientific literature
Thinning intensity and frequency	<ul style="list-style-type: none"> • Forest management plan • Forest management recommendations applicable to the forest certified level
Rotation length	<ul style="list-style-type: none"> • Forest management plan • Forest management recommendations • Empirical historic data for the certified area on rotation cycles applied
Cutting regime	<ul style="list-style-type: none"> • Forest management plan • Forest management recommendations
Other management decisions	<ul style="list-style-type: none"> • Forest management plan • Forest management recommendations

Source: REDIBIO study, page 52

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