



# Guidance Document

## Biomass issues in the EU ETS

**MRR Guidance document No. 3,  
Updated Version, 17 October 2022**

This document is part of a series of documents provided by the Commission services for supporting the implementation of the “Monitoring and Reporting Regulation (the “MRR”) for the EU ETS (the European Union Emission Trading System). A new version of the MRR was adopted for the use in the 4<sup>th</sup> phase of the EU ETS, i.e. Commission Implementing Regulation (EU) 2018/2066 of 19 December 2018 in its current version at the time of updating this guidance<sup>1</sup>.

The guidance represents the views of the Commission services at the time of publication. It is not legally binding.

This guidance document takes into account the discussions within meetings of the informal Technical Working Group on MRVA (Monitoring, Reporting, Verification and Accreditation) under the WG III of the Climate Change Committee (CCC), as well as written comments received from stakeholders and experts from Member States. This guidance document was endorsed by the representatives of the Member States at the Climate Change Committee by written procedure ending on 14 October 2022.

All guidance documents and templates can be downloaded from the Commission’s website at the following address:

[https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets/monitoring-reporting-and-verification-eu-ets-emissions\\_en](https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets/monitoring-reporting-and-verification-eu-ets-emissions_en)

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<sup>1</sup> Updated by Commission Implementing Regulation (EU) 2020/2085 of 14 December 2020 amending and correcting Implementing Regulation (EU) 2018/2066 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council; the consolidated MRR can be found here:  
[http://data.europa.eu/eli/reg\\_impl/2018/2066/2022-08-28](http://data.europa.eu/eli/reg_impl/2018/2066/2022-08-28)

## Version History

Date	Version status	Remarks
17 October 2012	published	Endorsed by CCC on 17 October 2012
27 November 2017	re-published	Revised version: Chapter relevant for Aircraft operators moved to Guidance Document No. 2; Further minor updates taking into account general updates of the MRVA suite of guidance materials.  Hyperlinks updated.
17 October 2022	re-published	Major revision: <ul style="list-style-type: none"> <li>● Move from MRR 2012 to MRR 2018, including its revisions in 2020 and 2022, i.e. revision for use in the 4<sup>th</sup> phase of the EU ETS.</li> <li>● Take into account new requirements by RED II (recast of the Renewable Energies Directive).</li> <li>● Description of RED II certification schemes based on implementing act (Art. 30(8) RED II), including examples</li> <li>● Guidance on biogas in grids extended</li> <li>● Further FAQs added</li> </ul>

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# 1 INTRODUCTION

## 1.1 About this document

This document has been written to support the implementation of the EU ETS Monitoring and Reporting Regulation (MRR), by explaining its requirements in a non-legislative language. It focusses on biomass issues only. For more general guidance, see GD 1 (General guidance for installations) and GD 2 (General guidance for aircraft operators). This guidance does not add to the mandatory requirements of the MRR, but it is aimed at assisting in more correct interpretation and facilitated implementation.

This document interprets the Regulation regarding requirements for biomass (focus on stationary installations). It takes into account the valuable input from the task force on monitoring and reporting established under the EU ETS Compliance Forum, and from the informal Technical Working Group on Monitoring, Reporting, Verification and Accreditation (TWG MRVA) of Member State experts established under Working Group 3 (WG III) of the Climate Change Committee.

This guidance document represents the views of the Commission services at the time of publication. It is not legally binding.

## 1.2 How to use this document

Where article numbers are given in this document without further specification, they always refer to the MRR 2018 in its current version<sup>2</sup>. Where “MRR” is specified without publication year, the MRR 2018 is meant.

This document explains the biomass-related provisions of the MRR 2018. While the MRR 2018 applies in general to emissions from 2021 onwards, several biomass-related provisions of the MRR 2018 will apply in full only from 2023.<sup>3</sup> A “New!” symbol (such as the one in the margin here) indicates where changes to requirements compared to the MRR 2012<sup>4</sup> have taken place.

This symbol points to important hints for operators and competent authorities.

This indicator is used where significant simplifications to the general requirements of the MRR are promoted.

The light bulb is used where best practices or useful hints are presented.

The tools tell the reader that other documents, templates or electronic tools are available from other sources.

The book points to examples given for the topics discussed in the surrounding text.

New!



Simplified!



<sup>2</sup> Implementing Regulation (EU) 2018/2066; The consolidated MRR valid at the time of updating this guidance can be found here: [http://data.europa.eu/eli/reg\\_impl/2018/2066/2022-08-28](http://data.europa.eu/eli/reg_impl/2018/2066/2022-08-28)

<sup>3</sup> For details on timing, see section 3.1.1.

<sup>4</sup> MRR 2012: Commission Regulation (EU) No 601/2012, with several amendments.

### 1.3 Where to find further information

All guidance documents and templates provided by the Commission on the basis of the Monitoring and Reporting Regulation (MRR) and the Accreditation and Verification Regulation (AVR) can be downloaded from the Commission's website at the following address:



[https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets/monitoring-reporting-and-verification-eu-ets-emissions\\_en](https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets/monitoring-reporting-and-verification-eu-ets-emissions_en)

The following **guidance documents** are provided<sup>5</sup>:

- “Quick guides” as introduction to the guidance documents below. Separate documents are available for each audience:
  - Operators of stationary installations;
  - Aircraft operators;
  - Competent Authorities;
  - Verifiers;
  - National Accreditation Bodies.
- Guidance document No. 1: “The Monitoring and Reporting Regulation – General guidance for installations”. This document outlines the principles and monitoring approaches of the MRR relevant for stationary installations.
- Guidance document No. 2: “The Monitoring and Reporting Regulation – General guidance for aircraft operators”. This document outlines the principles and monitoring approaches of the MRR relevant for the aviation sector. It also includes guidance on the treatment of biomass in the aviation sector, making it a stand-alone guidance document for aircraft operators.
- Guidance document No. 3: “Biomass issues in the EU ETS”: This document. It discusses the application of sustainability criteria for biomass, as well as the requirements of Articles 38 and 39 of the MRR. It is relevant for operators of installations and useful as background information for aircraft operators.
- Guidance document No. 4: “Guidance on Uncertainty Assessment”. This document for installations gives information on assessing the uncertainty associated with the measurement equipment used, and thus helps the operator to determine whether he can comply with specific tier requirements.
  - Guidance document No. 4a: “Exemplar Uncertainty Assessment”. This document contains further guidance and provides examples for carrying out uncertainty assessments and how to demonstrate compliance with tier requirements.
- Guidance document No. 5: “Guidance on Sampling and Analysis” (only for installations). This document deals with the criteria for the use of non-accredited laboratories, development of a sampling plan, and various other related issues concerning the monitoring of emissions in the EU ETS.

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<sup>5</sup> This list reflects the status at the time of writing this updated guidance. Further documents may be added later.

- Guidance document No. 5a: “Exemplar Sampling Plan”. This document provides an example sampling plan for a stationary installation.
- Guidance document No. 6: “Data flow and control system”. This document discusses possibilities to describe data flow activities for monitoring in the EU ETS, the risk assessment as part of the control system, and examples of control activities.
- Guidance document No. 6a: “Risk Assessment and control activities – examples”. This document gives further guidance and an example for a risk assessment.
- Guidance document No. 7: “Continuous Emissions Monitoring Systems (CEMS)”. For stationary installations, this document gives information on the application of measurement-based approaches where GHG emissions are measured directly in the stack, and thus helps the operator to determine which type of equipment has to be used and whether he can comply with specific tier requirements.
- Guidance document No. 8: “EU ETS Inspections”: Targeted at competent authorities, this document outlines the role of the CA’s inspections for strengthening the MRVA system of the EU ETS.

The Commission furthermore provides the following **electronic templates**:

- Template No. 1: Monitoring plan for the emissions of stationary installations
- Template No. 2: Monitoring plan for the emissions of aircraft operators
- Template No. 3: Monitoring plan for the tonne-kilometre data of aircraft operators
- Template No. 4: Annual emissions report of stationary installations
- Template No. 5: Annual emissions report of aircraft operators
- Template No. 6: Tonne-kilometre data report of aircraft operators
- Template No. 7: Improvement report of stationary installations
- Template No. 8: Improvement report of aircraft operators

There are furthermore the following **tools** available for operators:

- Unreasonable costs determination tool;
- Tool for the assessment of uncertainties;
- Frequency of Analysis Tool;
- Tool for operator risk assessment.

The following MRR **training material** is available for operators:

- Roadmap through M&R Guidance
- Uncertainty assessment
- Unreasonable costs
- Sampling plans
- Data gaps
- Round Robin Test



Besides these documents dedicated to the MRR, a separate set of **guidance documents on the AVR** is available under the same address. Furthermore, the Commission has provided guidance on the scope of the EU ETS which should be consulted to decide whether an installation or part thereof should be included in the EU ETS. That guidance is available under

[https://ec.europa.eu/clima/system/files/2016-11/guidance\\_interpretation\\_en.pdf](https://ec.europa.eu/clima/system/files/2016-11/guidance_interpretation_en.pdf)

#### **Monitoring for free allocation purposes:**



For phase 4 of the EU ETS, the rules for determining the amount of allowances allocated for free pursuant to Article 10a of the EU ETS Directive also require the monitoring and reporting of installation data. Those rules build to some extent on the MRR, but other data sets are involved (sub-installation level activity data and “attributed emissions”), and the monitoring and reporting is dealt with separately<sup>6</sup>. Relevant guidance documents and templates are presented on the Commission’s website:

[https://ec.europa.eu/clima/policies/ets/allowances\\_en#tab-0-1](https://ec.europa.eu/clima/policies/ets/allowances_en#tab-0-1)

In terms of monitoring, “Guidance on Monitoring and Reporting in Relation to the Free Allocation Rules (GD5)” is the most relevant, and “Verification of FAR Baseline Data Reports and validation of Monitoring Methodology Plans (GD4)” for verification of the relevant reports.

**All EU legislation** is found on EUR-Lex: <http://eur-lex.europa.eu/>

The most important legislation is furthermore listed in the Annex II of this document.



Also competent authorities in the **Member States** may provide useful guidance on their own websites. Operators of installations and aircraft operators should in particular check if the competent authority provides workshops, FAQs, helpdesks etc.

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<sup>6</sup> In addition to the monitoring plan under the MRR, a so-called MMP (Monitoring Methodology Plan) is required. Several other types of reports are relevant: A “Baseline Data Report” (BDR) every 5 years for the calculation of the free allocation, an annual “ALC” (Allocation Level Change) Report, and in case of new entrants, a “New Entrant Data report” – all of them are to be verified in accordance with the AVR.



## 2 OVERVIEW

Whenever an operator or aircraft operator intends to use biomass within his installation or for his aviation activities, the following issues are relevant in addition to the generic monitoring methodology<sup>7</sup>:

- In principle, the emission factor of biomass is considered zero<sup>8</sup>. Thus, no allowances for emissions stemming from biomass have to be surrendered, and the associated costs are avoided. However, the MRR 2018 allows such “zero-rating” of biomass emissions only, where the sustainability and greenhouse gas savings criteria of the Renewable Energy Directive<sup>9</sup> (“RED II”) are met, in order not to incentivise environmentally undesirable use of biomass:
  - Sustainability and GHG savings criteria (the RED II criteria) have to be applied, where appropriate. This is discussed in section 3 of this document. For aircraft operators, a copy of this text is provided in Guidance Document No. 2, Annex I.
  - Where materials or fuels contain both, fossil and biomass fractions, the biomass fraction (a “calculation factor”) has to be determined (see chapters 4.3, 6.2 and 6.3 of GD 1). The MRR provides for special requirements for determining the biomass fraction in Article 39, as dealt with in section 4 of this document.
- Biomass often consists of rather heterogeneous materials. Monitoring may be difficult. The MRR (Article 38) allows some pragmatic approaches, which are described in section 5 of this document. That chapter furthermore discusses biomass in the context of measurement based methodologies and the use of estimation methodologies.
- Information focussing on aircraft operators is given briefly in section 6, and in more detail in guidance document 2.
- Annex I of this guidance contains a list of biomass materials, and Annex II gives a list of acronyms and legislative texts.
- FAQs have been included as Annex III to this guidance document.

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<sup>7</sup> The “generic methodology” in this context refers to all monitoring and reporting activities required under the MRR for purely fossil materials. Details can be found in the guidance document No. 1 for installations, and GD 2 for aircraft operators.

<sup>8</sup> EU ETS Directive, Annex IV.

<sup>9</sup> Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast).

## 3 REQUIREMENTS FOR THE ZERO-RATING OF BIOMASS

### 3.1 Alignment of EU ETS and RED II

An important element of the MRR for phase 4 of the EU ETS is the alignment of requirements for biomass with those of the Renewable Energy Directive<sup>9</sup> (RED II), which is subject of chapter 3.

New! 

**The most important change from RED I<sup>10</sup> to RED II is that sustainability and GHG savings criteria are relevant not only for liquid, but also for solid and gaseous biomass.**

The relevant provisions for applying **sustainability and GHG savings criteria** (together, this document refers to them as the “**RED II criteria**”) are found in Article 38(5) of the MRR. That Article requires that the RED II criteria have to be met in order to apply an emission factor of zero to biomass (This is referred to as “zero-rating” the biomass in this document). Article 38(5) clarifies that **if those criteria are not met, the material must be treated like a fossil fuel**, i.e. the preliminary emission factor has to be considered the final emission factor.



#### 3.1.1 Transition period

New! 

The requirement to meet RED II criteria (Article 38(5) of the MRR) has been deferred due to delays in the availability of required implementing legislation. While the MRR requires in principle that Article 38(5) is applied from 1 January 2022, another amendment<sup>11</sup> allows Member States or their competent authorities to deviate from this requirement as follows:

Article 38(6): “*By way of derogation from paragraph 5, first subparagraph, Member States, or competent authorities as appropriate, may consider as fulfilled the sustainability and greenhouse gas emissions saving criteria referred to in that paragraph for biofuels, bioliquids and biomass fuels used for combustion from 1 January 2022 to 31 December 2022.*”

This MRR amendment means that effectively in many (or even all) Member States **the RED II criteria have to be applied by operators only from 1 January 2023.**

However, Member States which have already implemented all other required measures under the RED II, may nevertheless require operators in their territory to provide evidence for meeting RED II criteria as required by Article 38(5) already from 1 January 2022, and as discussed in section 3.4 below.



**Therefore, operators should get confirmation from the competent authority (e.g. from their website) which approach has been chosen.**

<sup>10</sup> Directive 2009/28/EC

<sup>11</sup> Commission Implementing Regulation (EU) 2022/388 of 8 March 2022 amending Implementing Regulation (EU) 2018/2066 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council. Download: [http://data.europa.eu/eli/reg\\_impl/2022/388/oj](http://data.europa.eu/eli/reg_impl/2022/388/oj)

## 3.2 Definitions

Article 3 of the MRR copies the biomass-related definitions<sup>12</sup> from the RED II as follows:

*(21) 'biomass' means 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;*

*(21a) 'biomass fuels' means gaseous and solid fuels produced from biomass;*

*(21b) 'biogas' means gaseous fuels produced from biomass;*

*(21c) 'waste' means waste as defined in point (1) of Article 3 of Directive 2008/98/EC, excluding substances that have been intentionally modified or contaminated in order to meet this definition;*

*(21d) 'residue' means 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;*

*(21e) 'agricultural, aquaculture, fisheries and forestry residues' means residues that are directly generated by agriculture, aquaculture, fisheries and forestry and that do not include residues from related industries or processing;*

*(22) 'bioliquids' means liquid fuel for energy purposes other than for transport, including electricity and heating and cooling, produced from biomass;*

*(23) 'biofuels' means liquid fuels for transport produced from biomass;*

From these definitions, the following can be concluded:

- In the context of installations:
  - Gaseous biomass is referred to as **biogas**, but it is also included in the term **biomass fuel** is used;
  - Liquid biomass is referred to as **bioliquid**. The term "biofuel" is relevant only for transport purposes (in the EU ETS this is important for aviation).
  - Solid biomass is included in the term **biomass fuel**.
- In the context of aircraft operators:
  - Only liquid fuels are currently used for aviation. Liquid biomass is referred to as "**biofuel**", as it is relevant for transport purposes.

**For better readability of this document, the term "biomass" is used in this document where more exactly it would have to refer to "biofuels, bioliquids or biomass fuels, or biogenic fractions of mixed fuels that fall into these categories".**

<sup>12</sup> Definitions here are not mutually exclusive. For example, wastes and residues can be at the same time biomass fuels or bioliquids, if they are used as fuels without further processing.

It is furthermore to be borne in mind that the Renewable Energy Directive – in accordance with its name – only regulates **energetic use** of biomass. Consequently, the RED II criteria apply, as worded in Article 29 of that Directive to *production of electricity, heating and cooling from biofuels, bioliquids or biomass fuels*. For the purpose of the EU ETS, “heating” should be interpreted in a wide manner, including all types of heat production (measurable and non-measurable heat). Consequently, where biomass is used as **process input** in installations (e.g. where a biomass material is used for chemical syntheses), and where no energy purpose can be identified, this biomass does not fall within the scope of the RED II, and consequently neither sustainability criteria nor GHG savings criteria apply. Such material may be zero-rated under the EU ETS if it complies with the definition of “biomass” without further restriction.

The above-mentioned link to energetic use is reflected in Article 38(5) of the MRR by restricting the RED II criteria to *combustion* of biofuels, bioliquids and biomass fuels. Competent authorities should ensure<sup>13</sup> that only those biomass quantities not used for combustion are exempted from the sustainability criteria.

Annex I of this guidance (section 7.1) contains an informative list of materials which can be considered as biomass (without prejudice to application of sustainability or GHG savings criteria).

### 3.3 Implications of the RED II criteria

A source stream<sup>14</sup> can be either fossil, biomass or a mixture of both. The application of RED II criteria leads to the need to distinguish furthermore the following types of source streams (some may appear as theoretical cases):

1. Fossil source streams;
2. Biomass where sustainability and/or GHG savings criteria apply:
  - (a) Criteria are satisfied: Biomass is zero-rated;
  - (b) Criteria are not satisfied: Biomass is treated like a fossil source stream, i.e. allowances have to be surrendered for these emissions. In the Commission’s annual emissions report template, emissions from fossil fractions and from “non-sustainable biomass” are reported separately.
3. Biomass where RED II criteria do not apply: Always zero-rated.
4. Mixed source streams:
  - (a) Fossil / biomass mix, where either RED II criteria do not apply, or where they apply and are satisfied: The emission factor is the preliminary emission factor<sup>15</sup> multiplied by the fossil fraction.
  - (b) Fossil / biomass mix, where RED II criteria apply and are not satisfied: The whole source stream is treated as fossil.

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<sup>13</sup> Point 8 of MRR Annex I, section 1, requires that the operator has in its monitoring plan “a description of the procedure used to assess if biomass source streams comply with Article 38(5)”. Competent authorities will assess this when they approve the monitoring plan of installations or aircraft operators.

<sup>14</sup> Source stream means either fuel or process material leading to emissions. For details see Guidance document No. 1 (general guidance for installations).

<sup>15</sup> Article 3(36) of the MRR defines: ‘preliminary emission factor’ means the assumed total emission factor of a fuel or material based on the carbon content of its biomass fraction and its fossil fraction before multiplying it by the fossil fraction to produce the emission factor.

- (c) Biomass mix or fossil / biomass mix, where RED II criteria apply and only a part of the biomass satisfies the applicable RED II criteria: These source streams are to be treated like those under point 4(a), with the non-sustainable part considered as part of the fossil fraction.

Examples:

- Point (a): This could be fibre wood panels, where biomass (wood, for which the RED II criteria are satisfied by certification under a voluntary scheme (see section 3.4)) is mixed with resins which are usually made from fossil raw materials.
- Point (b): This could be a liquid fuel where the supplier claims that x% biofuel has been added, but does not provide evidence for meeting the RED II criteria in accordance with section 3.4 of this guidance for that amount.
- Point (c): An example would be rape seed methyl ester (“biodiesel”), where the rape seed oil satisfies the sustainability criteria and respective evidence is provided, while the methanol is either stemming from fossil sources, or where it is claimed to be biomass, but no evidence for meeting the RED II criteria is available.



Note that the above classification assumes that the whole source stream has the same composition, or is analysed using the same methodology where calculation factors are not based on default values<sup>16</sup>. However, the situation may occur that a certain biofuel, bioliquid or biomass fuel is used, where some batches delivered do satisfy the relevant RED II criteria, while other batches do not. In such a case the operator may in its monitoring plan and emissions report either consider this material as one source stream with different biomass fraction values, or as two distinct source streams, one being biomass without meeting RED II criteria, and one biomass with RED II criteria met. The same approaches apply to mixed source streams where the biomass fraction only sometimes complies with the relevant sustainability criteria. Note, however, that the selection of either approach has implications on the selection of appropriate tiers. If separate source streams are chosen, the sustainable biomass source stream is always a *de-minimis* source stream, while a source stream with fossil or non-sustainable biomass fractions may have to comply with higher tiers, depending on its associated emissions (see section 5.2 of GD 1).



The above considerations lead to practical consequences when setting up the monitoring plan in relation to biomass: The simplest way forward would be to establish a written procedure<sup>17</sup> which requires the operator to attribute each batch of biomass used in the installation to either a “RED II compliant biomass” source stream<sup>18</sup> or to a “non-RED II compliant biomass” source stream, depending on whether a proof is available for meeting the applicable sustainability and/or GHG savings criteria or not. The ways of obtaining such proof are discussed in section 3.4 below.



<sup>16</sup> Similar to e.g. different batches of coal which are analysed separately, but all reported under the same source stream “coal”.

<sup>17</sup> See guidance document no. 1 on the topic of “written procedures” as supplement to the monitoring plan.

<sup>18</sup> Note that the MP and AER templates use also the simpler terminology “sustainable biomass” and “non-sustainable biomass”, where “RED II compliant / non compliant” is more precise.

### 3.4 Practical approach for RED II criteria



The Commission's website dedicated to renewable energy is:

<http://ec.europa.eu/energy/en/topics/renewable-energy>.

Information on voluntary schemes for certification of biofuels and biomass fuels can be found at [https://ec.europa.eu/energy/topics/renewable-energy/biofuels/voluntary-schemes\\_en](https://ec.europa.eu/energy/topics/renewable-energy/biofuels/voluntary-schemes_en)

These websites should be useful for looking for guidance on all issues regarding the assessment of RED II criteria which is not covered by guidance on the EU ETS websites.

According to the RED II, there are three ways in which economic operators can demonstrate compliance with the sustainability and GHG savings criteria for biofuels, bioliquids and biomass fuels:

- by means of a 'national scheme';
- by using a 'voluntary national or international scheme' that the Member State accepts. If the Commission has formally recognised the scheme, the certificates and proofs of sustainability of the scheme must be accepted by all Member States. Therefore, using a recognised scheme gives legal certainty to operators, ensures harmonised implementation of the RED II requirements and reduces the need for additional documentation;
- by providing all relevant evidence and GHG calculations themselves, having the information appropriately audited<sup>19</sup> (if this approach is accepted by national authorities in the Member State).

**For zero-rating biomass under the EU ETS MRV rules, the burden of proof concerning a biofuel, bioliquid or biomass fuel meeting the requisite sustainability and/or GHG savings criteria remains with the EU ETS operator or aircraft operator.** Possible proof can be provided from applicable documentation ensuring compliance with a national system or the availability of certificates containing evidence of sustainability issued under a voluntary scheme recognised by the Commission or the installation's (or aircraft operator's administering) Member State under the RED II (see sections 3.4.3 to 3.4.4). The evidence provided should furthermore indicate the amount of delivered biomass and identify the batch to which they relate. If the biomass has not already been certified (or where the certification does not cover all steps in the supply chain), the operators or aircraft operators would have to perform the necessary assessment themselves and have it audited accordingly by an auditor accepted by the Member State's legislation. Note, however, that the national legislation of the Member State may contain other provisions. Some Member States may e.g. accept only biomass that has been certified by a scheme recognised by the Commission.

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<sup>19</sup> Such audit is mandatory according to Article 30(3) of the RED II: "[...] Member States shall require economic operators to arrange for an adequate standard of independent auditing of the information submitted, and to provide evidence that this has been done. [...]". This audit can be performed by an EU ETS verifier only if the latter has the proven competence (i.e. accreditation) for that task (see section 3.4.6.5).

**Where compliance with the applicable RED II criteria cannot be confirmed to the satisfaction of the competent authority<sup>20</sup>, the biofuel, bioliquid or biomass fuel will have to be treated like a fossil source stream and not zero-rated.**

### 3.4.1 General responsibilities

The Member State where the installation is situated, or the administering Member State in case of aircraft operators, is responsible for defining the rules under which compliance with the RED II criteria must be demonstrated for the biofuels, bioliquids and biomass fuels used within the Member State. Biomass certification schemes under the RED II can cover different parts of the supply chain, and “economic operators” are often certified for only part of the supply chain. For the purpose of the EU ETS the burden of proof for compliance with the RED II criteria is on the user of the biomass, i.e. the operator of the installation or the aircraft operator, as these are the persons who have the obligation of reporting emissions. However, for practical reasons, the operator or aircraft operator will often have to rely on data and information<sup>21</sup> provided by third parties, i.e. either the supplier or producer of the biomass.



### 3.4.2 Which criteria apply?

Note: This section is a copy of section 6.3.6 of Guidance Document No. 1 (General guidance for installations). Because the Commission’s guidance may be updated from time to time, operators should regularly check whether new versions of either GD 1 or this document are available. In case of contradictions, the more recently published document should be consulted.



In most cases where “biomass” is mentioned in the MRR, it is added that “Article 38(5) applies”<sup>22</sup>. That article<sup>23</sup> clarifies the relationship between the MRR requirements and the RED II, and in particular how the sustainability and GHG saving

**New!**

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<sup>20</sup> Not only the competent authority, but also the verifier during verification will assess if the evidence for meeting the sustainability criteria is sufficient.

<sup>21</sup> See section 3.4.5 on the functioning of RED II certification schemes.

<sup>22</sup> An exception is Article 18(2) on unreasonable costs. In that context, Article 38(5) applies only “*provided that the relevant information ... is available to the operator*”. This condition is relevant because at the point in time when unreasonable costs are determined, it is often not clear yet whether the biomass intended to be used will comply with Article 38(5) or not. In practice this means that the operator has to apply Article 18(2) assuming that the biomass complies with the applicable RED II criteria, if more information is not available.

<sup>23</sup> Article 38(5) of the MRR:

*„Where reference is made to this paragraph, biofuels, bioliquids and biomass fuels used for combustion shall fulfil the sustainability and the greenhouse gas emissions saving criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001.*

*However, biofuels, bioliquids and biomass fuels produced from waste and residues, other than agricultural, aquaculture, fisheries and forestry residues are required to fulfil only the criteria laid down in Article 29(10) of Directive (EU) 2018/2001. This subparagraph shall also apply to waste and residues that are first processed into a product before being further processed into biofuels, bioliquids and biomass fuels.*

*Electricity, heating and cooling produced from municipal solid waste shall not be subject to the criteria laid down in Article 29(10) of Directive (EU) 2018/2001.*

*The criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001 shall apply irrespective of the geographical origin of the biomass.*

criteria of the RED II are to be applied in order to allow the emissions from biomass to be zero-rated. The following points are worth noting:

- As the RED II applies to renewable energy, the RED II criteria apply only to energy uses of biomass in the EU ETS, i.e. to combustion emissions within the meaning of the MRR<sup>24</sup>. This is clarified in the MRR itself, as Article 38(5) states “... *biofuels, bioliquids and biomass fuels used for combustion shall fulfil the sustainability and the greenhouse gas emissions saving criteria...*”
- As the RED II itself does not contain a definition of the term “installation”, the MRR clarifies that the definition of “installation” of the EU ETS Directive applies<sup>25</sup>.
- Not all the criteria given in Article 29 of the RED II apply. In particular:
  - The “land related” sustainability criteria of Article 29(2) to (7) of the RED II apply;
  - The GHG saving criteria of Article 29(10) of the RED II apply;
  - The additional efficiency criteria for electricity production (Article 29(11) of the RED II) do *not* apply;
  - Some provisions contained in Article 29(1) of the RED II are copied into the MRR in order to clarify their applicability. In particular, this includes the simplification that for municipal solid waste the GHG saving criteria do not apply. Furthermore the RED II criteria apply irrespective of the geographical origin of the biomass.

Figure 1 presents a “decision tree” to which an operator may adhere in order to determine which written procedures have to be included in the monitoring plan, and to determine the emission factor of biomass. The numbered steps in this picture mean the following:

1. The first step is to determine if the source stream consists exclusively of biomass, or whether it is mixed with a fossil fraction. In the latter case, the relevant analyses of the biomass fraction or the application of a reasonable default value is necessary (see section 4). The possibility to apply an emission factor of zero applies only to the biomass fraction of the source stream. If the biomass fraction should be determined based on proofs of sustainability from a certification scheme, please see section 4.3.2.

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*Article 29(10) of Directive (EU) 2018/2001 shall apply to an installation as defined in Article 3(e) of Directive 2003/87/EC.*

*The compliance with the criteria laid down in paragraphs 2 to 7 and 10 of Article 29 of Directive (EU) 2018/2001 shall be assessed in accordance with Articles 30 and 31(1) of that Directive.*

*Where the biomass used for combustion does not comply with this paragraph, its carbon content shall be considered as fossil carbon.”*

<sup>24</sup> Some borderline cases exist where it may not be clear if a material is a fuel or a process input, such as pore-forming agents in the ceramic industry. In this case, may be used as guidance: “Where the CO<sub>2</sub> emissions stem from a process which has a primary purpose other than the generation of heat, the competent authority may agree that the source stream is not acting as a fuel. Hence, such source streams serve non-energetic purposes and the sustainability criteria do therefore not apply.” (see also section 3.5 of GD2 on free allocation rules).

<sup>25</sup> Article 3(e) of the EU ETS Directive: ‘installation’ means a stationary technical unit where one or more activities listed in Annex I are carried out and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions and pollution;



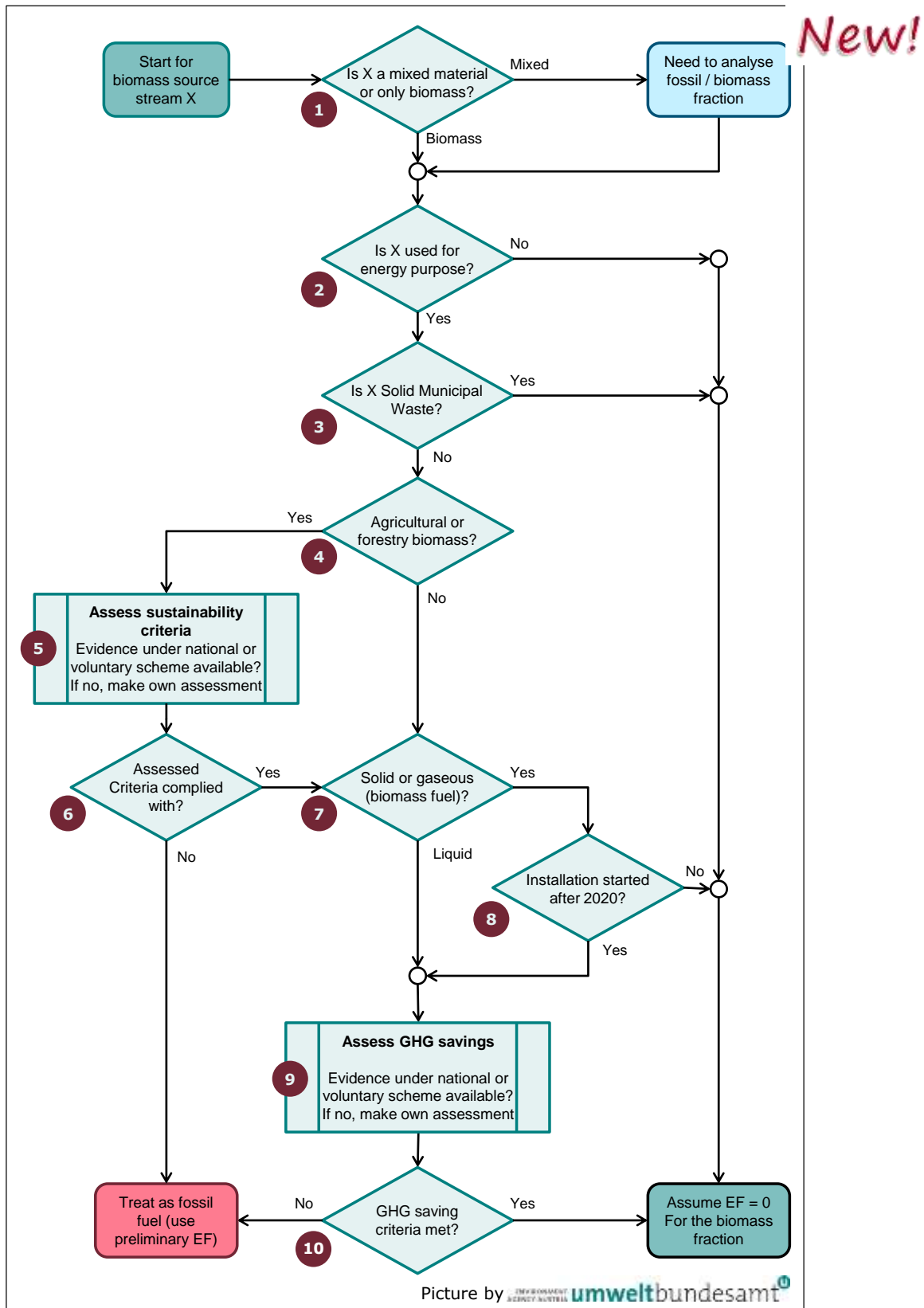


Figure 1: Decision tree for applying sustainability and GHG saving criteria of the RED II to the monitoring of EU ETS source streams.

If only a part of the source stream is biomass, the following steps apply only to that biomass fraction. However, if the necessary evidence for meeting the RED II criteria is available only for a part of that biomass fraction, the case mentioned in section 3.3 applies, where there are three fractions (one fossil, one biomass part that is treated like being fossil, and a biomass part which is zero-rated because it fulfils the RED II criteria).

2. Determine if the source stream is used for energy purposes. Only if this is the case, the following steps are needed.
3. If the source stream is municipal solid waste, no further criteria need to be taken into account. The biomass fraction may be zero-rated.
4. Determine if the source stream is any type of forest or agricultural biomass, or (produced from) “residues from agriculture, aquaculture, fisheries or forestry”, as for such source streams the “land-related” sustainability criteria (Article 29(2) to (7) of RED II) apply<sup>26</sup>. For other residues or waste (including all kinds of industrial wastes, if containing biomass), only GHG savings criteria need to be complied with. For further discussion of the definition of “waste”, please see section 3.4.6.4.

Note, however, that for biomass stemming from residues from animals, aquaculture and fisheries, Article 29 of the RED II does not list specific land-related sustainability criteria. There are also no default values found in Annexes V and VI of the RED II. Therefore, for such materials operators will have to determine only GHG savings based in the calculation methodologies outlined in those Annexes. Therefore, go to step 7.

5. Depending on step 4, the (land-related) sustainability criteria for the production of biofuels, bioliquids or biomass fuel are to be assessed. In short, the operator can rely on the certification of the used material/fuel under a national system or an (international) voluntary scheme recognised by the Commission or the installation’s (or aircraft operator’s administering) Member State. Competent authorities may require the operator to use a recognised scheme, where one is available. If no proof of sustainability under a certification scheme is available to the operator, the operator would have to perform the assessment of the relevant criteria himself, and get the verifier’s<sup>27</sup> confirmation, provided the national legislation and the competent authority allow this in the Member State where the biomass is used (in case of aircraft operators, the administering Member State). More details on steps 4 and 5 are given in sections 3.4.5 and 3.4.6.
6. If the previous step shows that the relevant sustainability criteria are not complied with, then the operator has to treat the material as if it were fossil, i.e. the preliminary emission factor becomes the emission factor.
7. If the source stream is liquid, the assessment of GHG savings is mandatory (i.e. the situation is like in the third phase of the EU ETS). Go to step 9.

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<sup>26</sup> Second subparagraph of Art. 38(5) MRR: “However, biofuels, bioliquids and biomass fuels produced from waste and residues, other than agricultural, aquaculture, fisheries and forestry residues are required to fulfil only the criteria laid down in Article 29(10) of Directive (EU) 2018/2001. This subparagraph shall also apply to waste and residues that are first processed into a product before being further processed into biofuels, bioliquids and biomass fuels.”

<sup>27</sup> See section 3.4.6.5 for more details.

8. As the additional requirement for “biomass fuels”, i.e. solid or gaseous biomass, applies only to installations starting operation<sup>28</sup> from 1 January 2021, older installations (more exactly: installations which used biomass already before 2021) do not have to carry out further assessment<sup>29</sup>.
9. According to Article 29(10) of the RED II, required GHG savings have to be calculated in accordance with Article 31(1) of the RED II). For details, please see section 3.4.6.2.
10. If the GHG savings are above the applicable threshold, the biomass can be zero-rated, otherwise it has to be treated as if it were fossil. With this step, the assessment is finished.

Note that when this “decision tree” results in no need to provide evidence with sustainability or GHG savings criteria, some Member States will still require a confirmation of the source stream’s nature providing of the fact that no RED II criteria apply. Member States may require such evidence to be issued by a certification scheme recognised by the Commission or the installation’s (or aircraft operator’s) Member State. Other Member States may require e.g. a formal declaration by the operator confirming the material type and that no RED II criteria apply to it.

### 3.4.3 National systems

Member States’ implementations of the RED II are currently partly still under development. They use diverse approaches. There is no complete overview available of Member States’ national systems on providing evidence of biomass sustainability and GHG savings. Operators and aircraft operators should obtain information on national systems from the relevant competent authority.

The RED II does not explicitly require a Member State to publish dedicated information. However, it is considered best practice to provide transparent information to operators. For the purpose of the EU ETS, Member States are therefore encouraged to consider practical ways of making information available to the public regarding the sustainability of biomass (by producer, brand, generic type or other suitable grouping), suppliers or producers thereof, or similar information, which allow the user of these biofuels, bioliquids or biomass fuels (and any EU ETS verifier) to gather assurance that a material complies with the applicable sustainability criteria.

Under the RED II, Member States may use the possibility of Article 30(6) to notify a national scheme to the Commission for recognition. If such recognition is granted, the relevant information will be published on the Commission website<sup>30</sup>, and all other Member States are required to accept the resulting certificates, like it is the case of voluntary international schemes recognised by the Commission. However, the use of international voluntary systems may be desirable in many cases where the biofuel, bioliquid or biomass fuel is not used in the Member State where it is produced (e.g. in the aviation sector).



<sup>28</sup> Article 29(10) of the RED is to be applied: "*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.*"

<sup>29</sup> See section 3.4.6.2 for further information on the starting date.

<sup>30</sup> See footnote 31.

### 3.4.4 Voluntary schemes

Details on all voluntary schemes recognised by the Commission can be found on the Commission's website<sup>31</sup>. Regarding schemes not [yet] recognised by the Commission, Member States may accept those schemes, if they come to their own conclusion that the scheme ensures compliance of the biomass with RED II criteria. Under the same conditions, the Member States may continue the acceptance of certificates issued by schemes approved under the RED I. However, Member States may have also other specific provisions in their legislation, e.g. allowing only schemes that have been recognised by the Commission. Hence, except when using schemes recognised by the Commission, operators will always have to check with their competent authority or national legislation how to provide evidence that the biomass used complies with the RED II criteria.

The most important aspect of the schemes recognised by the Commission is their applicability across the EU in a harmonised manner. This means that a biofuel, bioliquid or biomass fuel certified under such a recognised scheme will have to be recognised as sustainable in all Member States.

An operator who purchases a biofuel, bioliquid or biomass fuel which has received a proof of sustainability from a recognised voluntary scheme (i.e. a certificate of compliance with that scheme's rules), may in any case assume that it can be considered sustainable under the RED II, and can be used with an emission factor of zero in the EU ETS<sup>32</sup>. However, there are important limitations:

- The operator has to be aware that some voluntary schemes are approved only for some fuels types, some of the required criteria (e.g. only the sustainability criteria or only the GHG savings criteria), or only regarding some steps of the value chain (e.g. only collecting and trading, or only the actual biofuel production or processing stage, etc.). If applicable, another proof must be obtained for the remaining criteria or missing parts of the value chain.
- In particular the GHG savings criteria are highly dependent on the distance of transport to the EU ETS installation (see default values in Annex VI of RED II). Hence, if the economic operator under the certification scheme does not carry out the verification of the GHG savings criterion specifically for each site where the biomass is used, the operator will have to provide his own evidence for this purpose and ensure appropriate verification, or request an economic operator under the certification scheme to provide the missing certification. The latter may often be preferred by operators due to its simplicity, and may be required by the installation's Member State.
- Some sustainability schemes cover a wider scope than just RED II criteria. Many have an international background. Some have set up a specific version of the same overarching scheme for the purpose of demonstrating RED II compliance. Only the latter is recognised by the Commission. Operators, verifiers and competent authorities should be aware of these differences (where applicable), and use only certificates which explicitly refer to those "RED II compliant versions" of the voluntary schemes as eligible for zero-rating in the EU ETS.

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<sup>31</sup> [https://energy.ec.europa.eu/topics/renewable-energy/biofuels/voluntary-schemes\\_en](https://energy.ec.europa.eu/topics/renewable-energy/biofuels/voluntary-schemes_en). Approvals are valid for 5 years. It is therefore necessary to check the validity period of the approval in the relevant Commission Decision.

<sup>32</sup> In case of mixed materials or fuels, obviously the zero-rating applies only to the biomass fraction.

- Some schemes are recognised with limited geographical scope (e.g. if auditing services are available only in specific countries).
- The Commission's recognition of voluntary schemes are usually valid for five years. Furthermore, economic operators' certification can be suspended by the certification scheme. Only biofuels, bioliquids or biomass fuels covered by a valid recognition are eligible for zero-rating in the EU ETS.

Since all voluntary schemes are required to publish their rules, their certification bodies and the certificates issued on their website, operators of EU ETS installations can obtain all the required information. In case of doubt, direct contact to the certification scheme operator should be sought.

### 3.4.5 How do RED II certification schemes work?

Note: This section may apply to both, national or international schemes, which may be voluntary or required by Member States. Therefore the general term "certification scheme" is used. The description follows what is required for recognition of a scheme by the Commission. There may be some deviations in schemes not recognised.

Figure 2 provides an overview of the governance structure of certification schemes including the recognition by the Commission. First, certification scheme operators set up their certification scheme's rules (e.g. which scope they cover, which competence criteria they apply for their certification bodies and their auditors, which templates economic operators have to use, etc.). These rules have to be published by the certification scheme and must comply with the Implementing Regulation<sup>33</sup> pursuant to Article 30(8) of the RED II. That Regulation is also the basis against which the Commission checks the scheme before recognising it. Once a certification scheme is recognised by the Commission, the certificates issued to economic operators under the certification scheme have to be accepted in all Member States, as well as by all other recognised schemes (e.g. for parts of value chains). Recognition by the Commission is valid for a maximum of five years.

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<sup>33</sup> 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, available from [http://data.europa.eu/eli/reg\\_impl/2022/996/oj](http://data.europa.eu/eli/reg_impl/2022/996/oj)

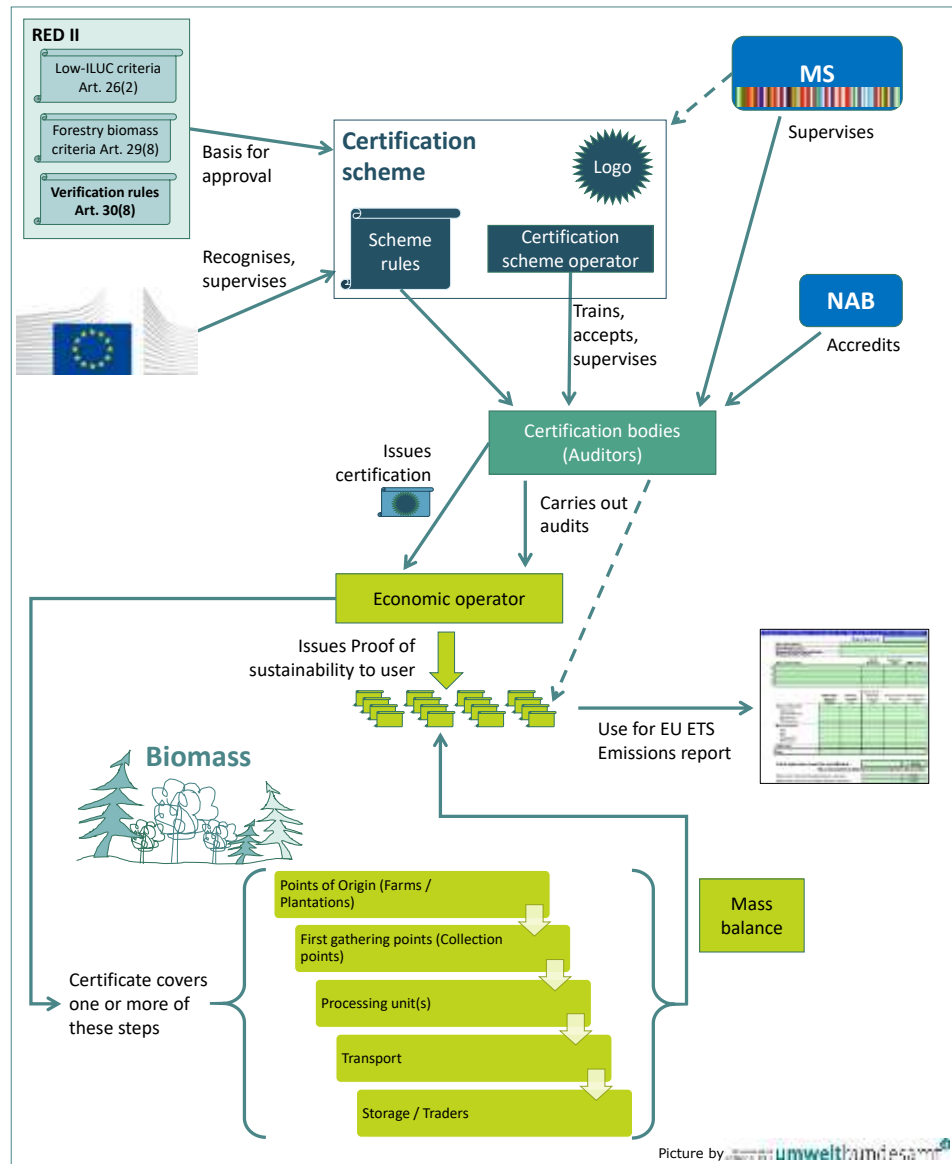


Figure 2: Overview of the functioning of voluntary schemes recognised by the Commission under the RED II.

The term “economic operator”<sup>34</sup> used in the context of the RED II covers several different cases, and the scope of their certification can vary accordingly. As shown in Figure 2, the biomass value chain can be complex, starting from the farm or forest (point of origin) over a “first gathering point”<sup>35</sup> (e.g. a trader’s warehouse or a train loading station), various transport and storage stages, and the

<sup>34</sup> Defined by Article 2(11) of the implementing act: “economic operator” means 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 greenhouse gas emissions saving characteristics of those raw materials or fuels;”

<sup>35</sup> Defined by Article 2(12) of the implementing act: “first gathering point” means a storage or processing facility managed directly by an economic operator or other counterpart under contractual

processing into biofuels. All these steps must be covered by the mass balance system under Article 30(1) for ensuring that there are neither data gaps nor double counting of biomass quantities. Biomass certification schemes usually offer different scopes of certification, so that economic operators can get certificates for the steps of the value chain which the operators cover. If e.g. an economic operator only carries out the “first gathering point” activity, or only production of biofuels from certain raw materials, the certificate will be issued only for these operations.

Furthermore, some certification schemes do not cover all the elements of the RED II. For example, it is not a given that all certification schemes also cover assessing the mass balances, some do not cover forest materials. Also the specific certification as “low-ILUC<sup>36</sup> biomass” is not always offered by certification schemes (not relevant in EU ETS context).

The consequence for the operator of an EU ETS installation or for an aircraft operator is:

- First, the operator has to determine which RED II criteria (sustainability and/or GHG savings) are relevant for the biomass used – this is discussed in section 3.4.2 of this document (“decision tree”).
- When using a certain type of biomass, the operator has to determine if the complete value chain from the point of origin to the combustion in the EU ETS installation is covered by proofs of sustainability, or whether additional proof is needed.
- The operator should determine whether it wants or has to act as an “economic operator” on its own, which obtains certification from a recognised scheme. This might e.g. be useful if the installation uses its own (waste) materials or has to cover only the last part of the value chain. Using a certification scheme gives a good level of legal certainty that compliance with the sustainability and GHG savings criteria can be proven. The alternative is to completely rely on another economic operator certified by an applicable certification scheme.
- When biomass has been processed, confirmation is needed that the information from the relevant<sup>37</sup> mass balance is complete, and proof that the biomass is marked<sup>38</sup> as “removed from the mass balance” when the biomass is consumed (e.g. if it is combusted in the installation).



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*agreement that is sourcing raw material directly from producers of agricultural biomass, forest biomass, wastes and residues [...]”.*

<sup>36</sup> ILUC = Indirect land-use change; Art. 2(37) RED II: “*low indirect land-use change-risk biofuels, bioliquids and biomass fuels*’ means biofuels, bioliquids and biomass fuels, the feedstock of which was produced within schemes which avoid displacement effects of food and feed-crop based biofuels, bioliquids and biomass fuels through improved agricultural practices as well as through the cultivation of crops on areas which were previously not used for cultivation of crops, and which were produced in accordance with the sustainability criteria for biofuels, bioliquids and biomass fuels laid down in Article 29”.

<sup>37</sup> Depending on the situation, this will usually be the operator’s own mass balance. In specific cases it might be a mass balance operated by an economic operator elsewhere in the value chain, provided that all necessary data are collected there and can be audited.

<sup>38</sup> How such marking can be done in practice depends strongly on how the mass balance is set up, in particular what IT system is used for it. If there is a sophisticated registry system which tracks each tonne or TJ of biomass with an individual certificate, the “removed from the mass balance” will be done by cancellation of the certificates associated with this amount of biomass. If a simple system (such as an Excel spreadsheet) is used, there may be a row stating “x tonnes removed”.

An important part of the certification scheme's rules is the framework for auditing<sup>39</sup>. The implementing act pursuant to Article 30(8) requires:

- The certification body acting on behalf of the certification scheme shall be accredited<sup>40</sup> to ISO 17065 (“Conformity assessment – Requirements for bodies certifying products, processes and services”).
- Audits of economic operators are to be carried out using ISO 19011 (“Guidelines for auditing management systems”).
- If the certification scheme performs audits on actual GHG values, it shall be accredited to ISO 14065 (“General principles and requirements for bodies validating and verifying environmental information”).
- Voluntary schemes shall set up training courses for their auditors covering the schemes' specific rules, and shall carry out supervision on them.



For EU ETS operators, this means that certification bodies carrying out audits regarding RED II criteria do not have the same requirements as EU ETS verifiers. If their verifiers have the relevant competence and accreditation, and if they are working under a biomass certification scheme which the operator of the EU ETS installation intends to use, it may be possible to combine some audit activities (e.g. during the same site visit) and make use of synergies accordingly. However, formally, auditing under a RED II scheme and verification under the EU ETS are separate activities. For example, formally there will be a need for two separate verification/audit reports.

### RED II “Certificate” vs. “Proof of Sustainability”



A *certificate*<sup>41</sup> is what certifies that an economic operator complies with the rules of the certification scheme. The *Proof of Sustainability*<sup>42</sup> is issued by the economic operator for confirming that a certain consignment of biomass material, biofuel, biogas or biomass fuel fulfils the sustainability or GHG savings criteria.

<sup>39</sup> In order to clarify the difference from EU ETS verification, this document uses here the term “certification body” for the (accredited) legal person / company, and “auditor” for the person doing the audits.

<sup>40</sup> Article 11(1) of the implementing act allows a deviation from accreditation as follows: “*Certification bodies shall also be accredited by a national accreditation body and in accordance with Regulation (EC) 765/2008 [the general framework Regulation on accreditation], or recognised by a competent authority to cover the scope of Directive (EU) 2018/2001 [the RED II] or the specific scope of the voluntary scheme. Where no use of such accreditation or recognition is made, Member States may allow voluntary schemes to use a system of independent oversight that covers the scope of Directive (EU) 2018/2001 or the specific scope of the voluntary scheme, for the territory of that Member State. The Commission shall review the effectiveness of the systems described in this paragraph with regard to their suitability to ensure adequate surveillance and issue guidance if appropriate.*” This means that Member States may deviate from accreditation only for their own Member State, except in cases covered by Regulation (EC) 765/2008.

<sup>41</sup> Article 2(4) of the implementing act defines “*certificate*” means a conformity statement by a certification body within the framework of a voluntary scheme, certifying that an economic operator complies with the requirements of Directive (EU) 2018/2001 [the RED II]”;

<sup>42</sup> Article 2(23) of the implementing act defines “*proof of sustainability*” means a declaration by an economic operator, made on the basis of a certificate issued by a certification body within the framework of a voluntary scheme certifying the compliance of a specific quantity of feedstock or fuels with the sustainability and greenhouse gas emissions savings criteria set out in Articles 25(2) and 29 of Directive (EU) 2018/2001 [the RED II]”.



The role of a certification body is therefore different from the EU ETS verifier in that not specific environmental data are verified, but the certification means that the **economic operator is certified as being capable** of managing the sustainability information, GHG savings data or the relevant mass balance system, depending on the certification scope. Depending on the certification scheme's rules, such certificate is valid for one year from the certification<sup>43</sup> (i.e. forward-looking, while EU ETS verification confirms data from the past). This does not mean that the auditor will not check data from specific consignments (batches) of biomass, but still the certificate proves that the economic operator is capable of issuing "proofs of sustainability" for the biomass material, biofuel, biogas or biomass fuel.

For the EU ETS operators, this means that **the evidence required is the "proof of sustainability"** for each of the consignments (batches) of biomass used so that emissions from biomass can be zero-rated in the annual emissions report. The evidence can be obtained by one of the following methods:



- The supplier of the biomass provides a proof of sustainability for the biomass delivered to the installation. The operator (and EU ETS verifier) would only have to check if the full value chain<sup>44</sup> and all required RED II criteria are covered. For the GHG savings criteria, emissions from transport to the installation need to be included.
- If the operator of the EU ETS installation has obtained a certificate from a certification scheme, the operator can apply the processes it has established for obtaining the certification, and issue proofs of sustainability for the biomass in question, and manage its own mass balance system for this purpose.
- Alternatively, and if applicable, the operator can apply other processes or certification rules, e.g. rules provided by a national scheme or directly by the Member State's legislation, taking into account any specific rules for auditing provided by the Member State.

#### **Note on the mass balance (Article 30(1) of the RED II):**

The certified economic operators must operate their mass balance systems and carry out the relevant determination of GHG emissions / savings as relevant. Depending on their activities' scope of certification, they issue proofs of sustainability, or pass the information on to the next user in the value chain of the fuel or material under consideration.

The different steps in the value chain do not necessarily have to be assessed under the same certification scheme. Articles 8 and 9 of the implementing act<sup>45</sup> requires that each scheme recognised by the Commission must also itself recognise certificates and proofs of sustainability from other recognised voluntary or national schemes.

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<sup>43</sup> The certificate has to give the validity period.

<sup>44</sup> "Full value chain" means from cultivation/first gathering point to the gate of the installation, including applicable processing steps (e.g. production of a biofuel). The steps covered should be indicated on the proofs of sustainability provided by the fuel supplier in this case.

<sup>45</sup> See footnote 33.

### Further notes on Figure 2:

Although the voluntary schemes are recognised by the Commission, it is still the responsibility of Member States to supervise the certification bodies active in the Member State, or active for certification schemes that are used by economic operators (including EU ETS installations) in the Member State. Therefore, certification bodies, even if accredited in another Member State, must make information on their audits available to any concerned Member State (i.e. to a competent authority which is not necessarily the same as for the EU ETS)<sup>46</sup>. If the competent authority finds non-compliance or other justified reasons, it shall inform the certification system operator and the Commission thereof.

In principle, Figure 2 also applies to national schemes. Therefore, a dashed arrow indicates that the MS can have a direct influence on a certification scheme. Furthermore, the arrow indicating audits on the proofs of sustainability is dashed because that audit may apply only limited assurance, while the audit of the economic operator's systems has to be done with reasonable assurance (at least for the initial audit). Later audits may choose an appropriate level of assurance based on a risk assessment.

Finally, the question may arise whether an installation using its own waste materials would be required to establish a mass balance system, despite the simple assumption of "everything in, everything out". Article 30(1) of the RED II seems clear in that regard that a mass balance is always required, since it is the main instrument for demonstrating that the applicable RED II criteria are applied to specifically those biomass consignments that are reported for emissions. This would be needed as evidence that, for example, no biomass from other sources (or even fossil materials) is added. However, for simple cases, also simple means will be sufficient, such as a simple spreadsheet or other documentation which lists inputs and outputs on a regular (daily, weekly, etc.) basis, as found proportionate to the situation. Some more information is given in section 3.4.6.3.

### 3.4.6 How to provide evidence for RED II criteria

This section explains how compliance against RED II criteria is checked. While these checks are usually performed under a certification scheme, the same considerations are relevant for operators who want to demonstrate compliance with RED II criteria without use of a certification scheme, if the Member State allows such approach.

Depending on the needs identified using the "decision tree" (section 3.4.2), either sustainability criteria, GHG savings criteria, or both or none of these apply. It is therefore possible to discuss sustainability criteria (section 3.4.6.1) and GHG savings criteria (section 3.4.6.2) separately. Furthermore the operator will have to

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<sup>46</sup> Article 30(9) 2<sup>nd</sup> subparagraph: „Competent authorities of the Member States shall supervise the operation of certification bodies that are conducting independent auditing under a voluntary scheme. Certification bodies shall submit, upon the request of competent authorities, all relevant information necessary to supervise the operation, including the exact date, time and location of audits. Where Member States find issues of non-conformity, they shall inform the voluntary scheme without delay.”

ensure completeness of information by using a mass balance as required by Article 30(1) of the RED II, as discussed in section 3.4.6.3. Guidance on specific issues is given thereafter:

- Application of RED II criteria to waste (section 3.4.6.4);
- Verification / RED II audit topics (section 3.4.6.5);
- Whether guarantees of origin can be used instead of proofs of sustainability is discussed in section 3.4.6.6.

**For more details, please refer to the legal text of the RED II.** The aim of the following sections is meant only as a short overview for orientation in the RED II. Furthermore, an implementing act on “*rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria*” gives detailed guidance<sup>47</sup>. This implementing act also gives the framework with which voluntary certification schemes have to comply.



### 3.4.6.1 Sustainability criteria

The sustainability criteria are defined in Articles 29(2) to (7) of RED II. They can be summarised as follows:

- Biofuels, bioliquids and biomass fuels produced from **residues**<sup>48</sup> **derived from agricultural land** (not from forestry) must comply with the conditions laid down in Article 29(2) of the RED II:  
“Operators or national authorities [must] have monitoring or management plans in place in order to address the impacts on soil quality and soil carbon.”
- Biofuels, bioliquids and biomass fuels produced **from agricultural biomass** (this includes the main product of that land, as well as residues) must comply with all of the following paragraphs of Article 29 of the RED II:
  - Article 29(3) excludes raw material obtained from *land with a high biodiversity value*, namely land that had a specified status in or after January 2008, whether or not the land continues to have that status. Relevant statuses listed are (a) primary forest and similar, (b) highly biodiverse forest and similar, (c) areas that are nature protected, and (d) highly biodiverse grassland. For Point (d), further criteria are given in an implementing act<sup>49</sup>.
  - Article 29(4) prevents the use of land which was *converted from land with high carbon stocks*, namely land that had a specified status in or after January 2008 and no longer has that status, in particular wetland and continuously forested areas.
  - Article 29(5) excludes biomass from *former peatland*, except if evidence is provided that no drainage of previously undrained soil is involved.
- Biofuels, bioliquids and biomass fuels produced **from forest biomass** (including residues from forestry) must meet certain criteria to minimise the risk of using forest biomass derived from unsustainable production (RED II Article

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<sup>47</sup> See footnote 33.

<sup>48</sup> Note that Article 30(3) of the RED II requires that materials are “*not intentionally modified or discarded so that the consignment or part thereof could become a waste or residue*”.

<sup>49</sup> Commission Regulation (EU) No 1307/2014 of 8 December 2014 on defining the criteria and geographic ranges of highly biodiverse grassland has been adopted under the RED I but still applies. See <http://data.europa.eu/eii/reg/2014/1307/oj>

29(6)), and must meet specified land-use, land-use change and forestry (LULUCF) criteria given by Article 29(7).

An implementing act<sup>50</sup> provides further guidance.

- For **other biomass** (e.g. animal waste or by-products; products, wastes or residues from aquaculture and fisheries; biomass from microorganisms, e.g. from industrial fermentation, etc.), no sustainability criteria are defined in the RED II. Therefore, no further assessments for these types of biomass are relevant. However, it will be useful for an operator to have evidence available that the source stream under discussion indeed falls within this category, i.e. it is a waste and not a material intentionally modified or contaminated in order to become waste<sup>51</sup>. Some certification schemes might provide the classification as part of their services, but this should only be necessary for borderline cases.

### 3.4.6.2 GHG savings

When the RED II requires GHG savings to be demonstrated, it means that the energy produced from biomass must lead to lower **life cycle emissions** than the use of comparable fossil fuels. The methodology for calculating GHG savings from biofuels and bioliquids is given in section C of Annex V to the RED II. For biomass fuels (biogas and solid biomass), the methodology is given in section B of Annex VI to the RED II. A short summary of the methodology is given here:

First, the emissions from the biomass use is calculated using the formula:

$$E = e_{ec} + e_l + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{ccr}$$

Where

$e_{ec}$  = emissions from the extraction or cultivation of raw materials<sup>52</sup>;

$e_l$  = annualised emissions from carbon stock changes caused by land-use change;

$e_p$  = emissions from processing;

$e_{td}$  = emissions from transport and distribution;

$e_u$  = emissions from the fuel in use<sup>53</sup>;

$e_{sca}$  = emission savings from soil carbon accumulation via improved agricultural management;

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<sup>50</sup> At the time of writing this guidance, the finalised text (pending publication in the official journal of the EU) is available at <https://ec.europa.eu/transparency/comitology-register/core/api/integration/ers/294191/083454/2/attachment>

<sup>51</sup> In line with the RED II definition of waste (Article 3(23) of RED II): “waste’ means waste as defined in point (1) of Article 3 of Directive 2008/98/EC, excluding substances that have been intentionally modified or contaminated in order to meet this definition.”

<sup>52</sup> Default emission factors at regional (NUTS2) level are available from the Commission’s website [https://energy.ec.europa.eu/topics/renewable-energy/biofuels/biofuels\\_en](https://energy.ec.europa.eu/topics/renewable-energy/biofuels/biofuels_en) and [https://energy.ec.europa.eu/system/files/2018-07/pre-iluc\\_directive\\_nuts2\\_report\\_val-ues\\_mj\\_kg\\_july\\_2018\\_0.pdf](https://energy.ec.europa.eu/system/files/2018-07/pre-iluc_directive_nuts2_report_val-ues_mj_kg_july_2018_0.pdf)

<sup>53</sup> Annexes V and VI of the RED II clarify: “Emissions of the fuel in use,  $e_u$ , shall be taken to be zero for **biofuels and bioliquids**. Emissions of non-CO<sub>2</sub> greenhouse gases (N<sub>2</sub>O and CH<sub>4</sub>) of the fuel in use shall be included in the  $e_u$  factor for bioliquids. Emissions of CO<sub>2</sub> from fuel in use,  $e_u$ , shall be taken to be zero for **biomass fuels**. Emissions of non-CO<sub>2</sub> greenhouse gases (CH<sub>4</sub> and N<sub>2</sub>O) from the fuel in use shall be included in the  $e_u$  factor.”

$e_{ccs}$  = emission savings from CO<sub>2</sub> capture and geological storage;

$e_{ccr}$  = emission savings from CO<sub>2</sub> capture and replacement.

For  $e_{ec}$ ,  $e_p$  and  $e_{td}$ , Annexes V and VI provide typical and default values for many feedstock types and processes for biofuel and biomass fuel production. In the case of solid biomass, transport emissions are given dependent of transport distance.

EU ETS installations often consume several types of waste materials or residues for which no default values can be found in the RED II. As a simplifying assumption, life cycle emissions of waste at the place and time when the material starts to comply with the definition of waste<sup>54</sup> may be considered zero, if the emissions of sourcing (cultivation, transport to upstream processing, and that processing itself) can be reasonably attributed to the main products instead of the waste. Therefore, for such wastes, only the transport emissions up to the EU ETS installation (if any) as well as potential emissions from processing before combustion (if any) in the EU ETS installation would have to be taken into account for determining their life cycle emissions. Section 3.4.6.4 gives more details on treating waste regarding RED II criteria.



For  $e_u$  the methodology in the RED II also gives instructions how the production of heat and electricity is to be handled if produced separately or by CHP<sup>55</sup>. Note that the approach to taking into account CHP is different from the approach used by the FAR (Free Allocation Rules for the EU ETS)<sup>56</sup>.

$e_{sca}$  may only be taken into account if solid and verifiable evidence is provided.  $e_{ccs}$  and  $e_{ccr}$  are only relevant if CCS/CCU are applied.

Greenhouse gases to be taken into account and their GWP<sup>57</sup> values are CO<sub>2</sub>, N<sub>2</sub>O (GWP=298), CH<sub>4</sub> (GWP=25).

Where a proof of sustainability from a certification scheme is available (section 3.4.5) at least for some parts of the value chain, the relevant  $e$  values for the formula above should be available from that proof. Also the GHG savings as calculated below should be given.



As a second step, the GHG savings are calculated as follows:

For the use of (transport) biofuels:

$$SAVING = (E_{F(t)} - E_{B(t)})/E_{F(t)}$$

Where:

$E_B$  = total emissions from the biofuel;

$E_F$  = total emissions from the fossil fuel comparator

<sup>54</sup> For more guidance see section 3.4.6.4.

<sup>55</sup> Combined Heat and Power (Cogeneration)

<sup>56</sup> The FAR (Regulation (EU) 2019/331) use the method provided by the Energy Efficiency Directive (2012/27/EU) and its reference values (Commission Delegated Regulation (EU) 2015/2402), while the RED II uses a method based on the Carnot efficiency.

<sup>57</sup> GWP means the Global Warming Potential. Unfortunately, the GWP values given in the RED II have not yet been updated to those of the IPCC's 5<sup>th</sup> Assessment Report, which are used by the MRR. However, an update of these values by the Commission at a later stage is possible.

For the production of heating (and cooling) and electricity:

$$SAVING = (EC_{F(h\&c,e)} - EC_{B(h\&c,e)}) / EC_{F(h\&c,e)}$$

Where:

$EC_{B(h\&c,e)}$  = total emissions from the biomass fuel or bioliquid;

$EC_{F(h\&c,e)}$  = total emissions from the fossil fuel comparator for heating, cooling or electricity, as applicable

The generation efficiency  $\eta$  for heating, cooling or electricity has to be taken into account as follows:

$$EC = E / \eta$$

The following fossil fuel comparators apply<sup>58</sup>:

Purpose	Value of the fossil fuel comparator
Transport fuels (liquid): $E_{F(l)}$	94 g CO <sub>2</sub> eq/MJ
Production of electricity: $EC_{F(e)}$	183 g CO <sub>2</sub> eq/MJ ( <sup>59</sup> )
Production of useful heat, and heating and/or cooling: $EC_{F(h\&c)}$	80 g CO <sub>2</sub> eq/MJ ( <sup>60</sup> )

In EU ETS installations, “useful heat” can mean both, measurable and non-measurable heat (as defined by the “FAR”<sup>61</sup>). When measurable heat is generated, an efficiency for heat generation from the fuel is known (or can be at least determined in principle). The fossil fuel comparator takes such efficiency into account. For non-measurable heat, however, a fictitious heat generation efficiency of  $\eta = 90\%$  needs to be applied for making the amount of fuel used compatible with the comparator.

Secondly, if both, heat and electricity are produced in the installation, the respective fuel quantities have to be checked against the respective fossil fuel comparators separately. If a certification scheme is used, the economic operator (which may be the EU ETS operator) doing the calculation must take the information on the efficiency of heat and electricity generation into account appropriately.

Finally, the GHG savings must be compared to the criteria given in Article 29(10) of the RED II:

- For **biofuels, biogas consumed in the transport sector and bioliquids**, savings must be at least 50% if *produced*<sup>62</sup> in installations in operation before 5 October 2015, at least 60% for installations starting operation until 31 De-

<sup>58</sup> For liquid transport fuels, the comparator refers to the energy content of the fuel (NCV), while for the production of heat and electricity, the comparator refers to the amount of heat / electricity produced (taking into account the CHP calculation, where relevant).

<sup>59</sup> For outermost regions, the comparator for biomass fuels is 212 g CO<sub>2</sub>eq/MJ.

<sup>60</sup> For biomass fuels used for the production of useful heat, in which a direct physical substitution of coal can be demonstrated, the comparator is 124 g CO<sub>2</sub>eq/MJ.

<sup>61</sup> Free Allocation Rules, Commission Delegated Regulation (EU) 2019/331.

<sup>62</sup> This criterion is relevant if the EU ETS installation produces these fuels and delivers them to other users who have to provide proof for RED II compliance, but also if the installation consumes these fuels itself. Regarding biogas, the “for transport” purpose would then not be given. Instead, the criterion for biomass fuels in the next bullet point would apply.

ember 2020, and at least 65% for installations starting operation from 1 January 2021. However, this calculation is usually performed by the *producer* of the biofuel, not by installations (or aircraft operators) in the EU ETS *consuming* such bioliquid or biogas. However, if an EU ETS installation also *uses* diverse liquid biomass wastes or biogas<sup>62</sup>, it may consider itself to be the producer of the bioliquid or biogas. In such case, the GHG savings calculation may have to be performed by the operator of the EU ETS installation, or by a certification scheme on his behalf.

- For **biomass fuels** (i.e. solid and gaseous biomass) *consumed* in EU ETS installations, GHG savings must be
  - at least 70% in installations starting operation from 1 January 2021 until 31 December 2025,
  - 80% for installations starting operation from 1 January 2026.

For the purpose of the above, the starting date definition of RED II Article 29(10) applies: “*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.*” In line with Article 38(5) of the MRR, for the purpose of the EU ETS the ‘installation’ means the whole EU ETS installation<sup>63</sup>.

For a practical approach to define “start of operation” of an EU ETS installation, it appears appropriate to use the first day of operation when at least one biofuel, bioliquid or biomass fuel has been used for regular operation, i.e. when there were permanent physical means to use such biomass for production of heating, cooling or electricity. “*Parts of installations used for research, development and testing of new products and processes*” (point 1 of Annex I EU ETS Directive) would not be taken into account.

In case of installations previously excluded from the EU ETS (Article 27 and 27a of the Directive), or installations exceeding the threshold (e.g. 20 MW thermal rated input) for inclusion in the EU ETS for the first time, it seems appropriate to apply the above-mentioned criterion of first use of biomass irrespective of the date of inclusion in the EU ETS.

Note: A potentially useful tool which supports the calculation of GHG savings has been published by a European project: [https://www.biograce.net/biograce2/content/ghgcalculationtool\\_electricityheatingcooling/overview](https://www.biograce.net/biograce2/content/ghgcalculationtool_electricityheatingcooling/overview). However, there is no obligation to use such tool.



### 3.4.6.3 Setting up a mass balance

The mass balance in accordance with Article 30(1) of the RED II is basically a database tracking quantities (physical consignments) over time. Each addition or withdrawal of a quantity must be entered, where processing and mixing steps may be treated as withdrawal from one consignment and adding it to another one. For each consignment the information on already proven sustainability needs to be stored, as well as lifecycle GHG emissions already caused by that biomass. If

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<sup>63</sup> However, outside the EU ETS, for other purposes of the RED II, e.g. for granting financial support for electricity production from biomass, other definitions of ‘installation’ may apply, e.g. individual boilers or power plant blocks. Furthermore, Art. 29(11) with further criteria for electricity production may apply as well.

a quantity is withdrawn and passed on to another economic operator, the information on sustainability and GHG emissions is passed on, too.

When setting up such a mass balance, operators have to keep in mind that it must be complete and transparent (auditable), and that data is protected against unintended change or loss. Hence, a simple spreadsheet will only be sufficient in very simple cases.

### Co-processing

Co-processing means the use of fossil and biomass materials in the same process, e.g. where fuels are produced in a refinery from a feedstock mixed of crude (mineral) oil and vegetable oil. In such cases, a measurement of <sup>14</sup>C in the product could obtain the percentage of biomass (i.e. the biomass fraction in EU ETS terminology). However, when just using a mass balance approach, it is an open question how the biomass fraction in the final products should be determined and which share of the emissions from the refining process should be attributed to biomass. In the example, it would be theoretically possible to consider the whole biomass being emitted during the refining process. Alternatively, the biomass could be equally assigned as percentage to all refinery products, or only to one specific product, e.g. kerosene.

At the time of writing this document, the Commission is preparing a delegated act under Article 28(5) of the RED II which will provide rules on treatment of co-processing<sup>64</sup>. Based on that draft delegated act, operators of EU ETS installations should ensure that any calculation approach for the production or consumption of mixed fuels should be as close as possible to the physical/chemical reality (“trace the atom” approach). The draft act allows several methods for providing evidence on the biomass fraction contained in the products (mass balance, energy balance, yield method and <sup>14</sup>C analyses). However, all methods are to be calibrated against <sup>14</sup>C analyses.

#### 3.4.6.4 Application of RED II criteria to waste

Specific provisions apply for waste with respect to the sustainability and GHG savings criteria (see also section 3.4.2):

- In line with the methodology given in the Annexes<sup>65</sup> of the RED II, “*no emissions shall be allocated to wastes and residues*” [at the first point of collection] when calculating life cycle emissions and GHG savings. This means effectively that for waste of biological origin which is generated directly at the EU ETS installation, the GHG savings criteria will usually be fulfilled, and this will be easily demonstrated.
- For “*biofuels, bioliquids and biomass fuels produced from waste and residues, other than agricultural, aquaculture, fisheries and forestry residues*”, no compliance with sustainability criteria has to be demonstrated.

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<sup>64</sup> [https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12711-Renewable-energy-method-for-calculating-the-share-of-renewables-in-the-case-of-co-processing\\_en](https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12711-Renewable-energy-method-for-calculating-the-share-of-renewables-in-the-case-of-co-processing_en)

<sup>65</sup> Point 18 of section C of Annex V regarding biofuels and bioliquids, and point 18 of section B of Annex VI regarding biomass fuels (biogas and solid biomass).



The first tricky point here is **to determine if a material is indeed waste**, or whether it is a product, by-product<sup>66</sup> or residue from a production process. However, this is not the task for an EU ETS guidance document. It is considered more reliable to consult guidance documents which the Commission has provided in the context of the Waste Framework Directive (WFD<sup>67</sup>). The WFD defines “*waste*’ means any substance or object which the holder discards or intends or is required to discard” and the RED II definition adds (see also section 3.2) that the waste excludes “*substances that have been intentionally modified or contaminated in order to meet this definition*”. The Commission guidance on the interpretation of key provisions of the Waste Directive<sup>68</sup> clarifies that a case-by-case assessment by the competent authority may be required. It says for example that the mere fact that a substance fits into a category of the European waste catalogue<sup>69</sup> is not sufficient for making a material a waste. Furthermore, some RED II certification schemes may give support by providing confirmation if a material is to be considered waste.



With respect to whether a material is considered “*agricultural, aquaculture, fisheries and forestry residues*”, the RED II and MRR help by providing the definitions



- *‘residue’ means 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;*
- *‘agricultural, aquaculture, fisheries and forestry residues’ means residues that are directly generated by agriculture, aquaculture, fisheries and forestry and that do not include residues from related industries or processing.*

However, again it will require a case-by-case decision by the competent authority if a material meets those definitions in the concrete context of the EU ETS installation.

If an installation uses biomass for combustion and the biomass is a waste (or residue other than agricultural, aquaculture, fisheries and forestry residue) generated by the installation itself, the operator only has to perform the task of classifying the material. If it is found that the category waste (or residue other than agricultural, aquaculture, fisheries and forestry residue) applies, no further RED II criteria apply. However, whether in this case the proof of sustainability from a certification scheme is required or not depends on the Member State’s way of transposing the RED II into national legislation. The operator of such installation will have to take the national legislation into account when setting up its monitoring plan. If a certification scheme recognised by the Commission is used (in particular if required by the Member State), Article 21 of the Implementing Act on



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<sup>66</sup> Unlike waste, a by-product is a material that has some commercial value. Article 5(1) of the Waste Framework Directive lists conditions for something being a by-product:

“*(a) further use of the substance or object is certain;*

*(b) the substance or object can be used directly without any further processing other than normal industrial practice;*

*(c) the substance or object is produced as an integral part of a production process; and*

*(d) further use is lawful, i.e. the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.”*

<sup>67</sup> Directive 2008/98/EC

<sup>68</sup> [https://ec.europa.eu/environment/pdf/waste/framework/guidance\\_doc.pdf](https://ec.europa.eu/environment/pdf/waste/framework/guidance_doc.pdf)

<sup>69</sup> Commission Decision (2000/532/EC). For guidance, see Commission notice on technical guidance on the classification of waste (C/2018/1447): [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C\\_.2018.124.01.0001.01.ENG](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.C_.2018.124.01.0001.01.ENG)

certification schemes<sup>33</sup> applies. It requires that the certification scheme ensures (by inclusion in the auditing activities) that only materials are considered wastes or residues if they are not deliberately modified to fall into these categories.

FAQ No. 5 in the Annex of this document (section 9.5) deals with some specific waste-related questions.

#### **3.4.6.5 Verification / audits**

In section 3.4.5 it was discussed that operators of EU ETS installations or aircraft operators can provide evidence on complying with RED II criteria by one of the following approaches:

- All evidence (i.e. the “proof of sustainability”) is provided by means of voluntary or national schemes by economic operators other than the EU ETS installation which consumes the biomass;
- The operator becomes an “economic operator” certified by a recognised voluntary or a national scheme; or
- The operator assesses the applicable sustainability and/or GHG savings criteria itself, if the (administering) Member State’s legislation allows this approach.

For the last two options, RED II Article 30(3) – which is relevant pursuant to the 6<sup>th</sup> subparagraph of MRR Article 38(5) – requires that economic operators have to “*arrange for an adequate standard of independent auditing of the information submitted, and to provide evidence [to the competent authority] that this has been done.*” The auditors engaged in this step are not necessarily the EU ETS verifiers. However, if the EU ETS verifier has the relevant competence and accreditation, the EU ETS verifier could carry out the relevant audit. In any case, the result of RED II audits should be made available to the EU ETS verifier.

Under the second option, the implementing act<sup>70</sup> pursuant to Article 30(8) of the RED II requires the operator to use a certification body which is trained and accepted by the relevant voluntary or national scheme recognised by the Commission. This will ensure that the auditors of the certification body have the relevant competence<sup>71</sup>. For the third option, however, the operator has to take into account any applicable national legislation for determining which certification bodies can carry out the required verification.

#### **3.4.6.6 Can Guarantees of Origin be used for demonstrating RED II criteria?**

Article 19 of the RED II regulates Guarantees of Origin (GoO). GoO “*means an electronic document which has the sole function of providing evidence to a final customer that a given share or quantity of energy was produced from renewable sources*” (Article 2(12) of the RED II). GoO are exclusively used for the sake of information to final consumers of electricity, heating or cooling, or gases (biogas or hydrogen) on the source of supply. They are issued at the request of producers of renewable energy and are traded on the market, whereby they can provide an additional revenue stream to supplement other means of financial support to the

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<sup>70</sup> See footnote 33.

<sup>71</sup> See section 3.4.5, How do RED II certification schemes work?

production of renewable energy. They can neither be used by Member States as proof for meeting their renewable targets, nor for demonstrating that sustainability or GHG savings criteria are met. GoO do not contain sufficient information to certify sustainability<sup>72</sup>.

Because GoO can be traded independently from physical quantities of biomass, they do not ensure by themselves that double counting is prevented. RED II Article 19(2) requires MS to ensure that double counting is avoided<sup>73</sup>. Section 0 discusses the special case of GoO in the context of biogas being added to natural gas grids.

### 3.4.7 Examples

Annex I of the MRR requires the operator, if applicable, to include in the monitoring plan a description of a written procedure to assess whether biomass source streams comply with the requirements of MRR Article 38(5), i.e. whether the RED II criteria are complied with. Such written procedure will be highly dependent of several factors, in particular if the operator has identified a recognised certification scheme which provides proof of sustainability for the biomass under consideration, and on national legislation in the MS, as has been discussed in sections 3.4.1 to 3.4.6 above.

#### Example 1:

An installation started operation in May 2021 and combusts elephant grass (*Miscanthus × giganteus*) for the production of district heating and electricity in a CHP plant. Using the decision tree in section 3.4.2, the operator identifies the following relevant RED II criteria:

- The land-related sustainability criteria are relevant, since the elephant grass is no waste or residue, but the main product of the agricultural activity;
- The biomass is solid, but the installation started its operation after the beginning of 2021. Therefore, GHG savings criteria need to be complied with. After discussion with a consultant familiar with RED biomass certifications, the operator concludes that the following information is required:
  - Emissions from cultivation and harvesting ( $e_{ec}$ );
  - Emissions from carbon stock changes caused by land-use change ( $e_l$ );
  - (There are no emissions from processing);
  - Emissions from transport (including from first collection point to a warehouse operator, and then from the warehouse to the EU ETS installation) ( $e_{td}$ );
  - Emissions from use (for this purpose, operational data from the CHP plant are needed) ( $e_u$ ).
- The calculated emissions have to be compared against the fossil comparators for heat and electricity production (see section 3.4.6.2).



<sup>72</sup> GoOs have to comply with EN 16325. That (draft) standard allows to include optional information on e.g. CO<sub>2</sub> emissions, but not sufficient to certify the sustainability requirements.

<sup>73</sup> "Member States shall ensure that the same unit of energy from renewable sources is taken into account only once." (Red II Article 19(2) 2<sup>nd</sup> sub-paragraph).

The operator wants to cover the operation in full by a certification scheme. The operator carries out some research. Basically, this requires checking the system description on the websites of schemes recognised by the Commission whether they cover all steps of the required value chain. The operator selects the (fictitious) UBACert system, which has received the Commission's recognition in early 2022.

Under UBACert, the warehouse as economic operator is certified by the fictitious certification body HFverif Ltd. HFverif agrees with the warehouse operator that the warehouse may issue proofs of sustainability that provide evidence of compliance with all relevant sustainability and GHG savings criteria. In particular, this also includes in the scope the transport and use emissions information, provided that the transport mode (train or truck) is always confirmed on the delivery notes, and that the EU ETS operator provides operational data on the CHP plant. HFverif's auditor carries out a site visit at the EU ETS installation and at the warehouse for the initial audit. Based on a risk assessment<sup>74</sup>, HFverif requires further audits every two years.

Procedure:

1. The shift personnel at the entrance gate is instructed to report every delivery of a batch of elephant grass to the RSM (ETS Responsible Shift Manager)<sup>75</sup>.
2. RSM collects delivery notes, which in particular contain the mass of the delivery, the mode of transportation and a unique consignment reference number which allows checking the warehouse's mass balance.
3. Every 2<sup>nd</sup> working day of a month, department ENV requests the proofs of sustainability (PoS) from the warehouse. Upon receipt, the PoS are checked for completeness against the unique consignment reference numbers. In case of missing proofs, the mass of that consignment is noted as "non RED II compliant", and its emissions are reported in the annual emissions report as fossil (using the default emission factor stated in the monitoring plan).
4. Each year, three weeks before the end of the validity of the warehouse's certificate under UBACert, ENV department contacts the warehouse requesting a copy of the latest/new certificate. A reminder is set for the next such event in ENV's calendar.
5. Each year, six months before the end of the validity of the warehouse's certificate under UBACert, ENV department contacts the warehouse asking for the planning of the next audit, i.e. whether it will be again HFverif to carry out the audit, and if and when a site visit at the EU ETS installation is planned. Reminders are set in ENV's calendar accordingly.
6. Each year in November, the ENV department contacts UBACert, checking whether the Commission's recognition is still valid. If this is not the case, ENV will contact the competent EU ETS authority asking if it would still consider UBACert's certificates. If not, ENV will report to CEO asking for a mandate to look for a new certification scheme.

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<sup>74</sup> Based on the implementing act referred to in footnote 33.

<sup>75</sup> Note that not the name of responsible staff, but the name of the post is to be used, in order to avoid necessary updates whenever staff changes.

7. Each year during the second week of January, ENV department compiles information on all steps above and prepares to hand the information over to the EU ETS verifier who verifies the annual emission report. ENV department stores all related information for a minimum period of 10 years<sup>76</sup>.

### Example 2:

An EU ETS installation burns glycerol which is a by-product from various biodiesel production sites. The result of the combustion process is medium pressure steam (i.e. heat). The glycerol comes by train from (currently) 5 different plants at a distance of up to 300 km. The operator wants to save the costs for getting certification as economic operator by a certification system. National legislation allows that the operator provides the relevant evidence to a competent authority without using a voluntary scheme, and that accredited EU ETS verifiers, after a dedicated 5-day training on the Member State's national RED II legislation, can obtain an additional accreditation scope for this purpose.

Using the decision tree in section 3.4.2, the operator identifies the following relevant RED II criteria:

- The land-related sustainability criteria are NOT relevant, since the glycerol is a residue<sup>77</sup> from biodiesel production;
- The GHG savings criteria apply. The following information is required:
  - Because glycerol is a residue of a process in which the emissions are attributed to the main product (biodiesel), emissions from cultivation and collection ( $e_{ec}$ ), from carbon stock changes caused by land-use change ( $e_l$ ) as well as from processing ( $e_p$ ) are zero;
  - Emissions from transport from the biodiesel plants to the EU ETS installation are relevant ( $e_{td}$ );
  - Emissions from use are relevant (i.e. the emissions from glycerol combustion in the EU ETS installation ( $e_u$ ) – This means total greenhouse gas emissions from combustion. The CO<sub>2</sub> emissions of biomass are zero, but emissions of non-CO<sub>2</sub> greenhouse gases (CH<sub>4</sub> and N<sub>2</sub>O) from the fuel use shall be included in  $e_u$  for bioliquids and biomass fuels<sup>78</sup>;
  - The calculated emissions have to be compared against the fossil comparator for heat production (see section 3.4.6.2).

In principle, the above points result in one calculation for each of the plants from which the glycerol is sourced. If there are no variables changing over time (e.g. change of transport mode), the operator has to carry out the calculations only once instead of annually, and have it verified only once (if this is in line with the Member State's legislation and/or accepted by the competent authority).



<sup>76</sup> Requirement of Article 67 MRR.

<sup>77</sup> Glycerol is used as input in chemical and other industries, i.e. it has – at least if sufficiently pure – a market value. It will therefore usually not qualify as waste.

<sup>78</sup> RED II, Annex VI contains default values for “non-CO<sub>2</sub> emissions from the fuel in use” for some biomass fuels.

The quantity of glycerol delivered by each of the five glycerol providers needs to be monitored throughout the year. The operator collects the delivery notes and/or invoices which provide evidence that no glycerol from other plants than the initial five is delivered. Should a new source of glycerol be used, the calculation will have to be carried out for the new source.

In case that at least one of the source plants is so far away from the EU ETS installation that the transport emissions cause the GHG savings criterion not to be fulfilled, the procedure must furthermore ensure that any quantity of glycerol sourced from that plant is treated as if it were from a fossil source.

The annual verification under the EU ETS would focus on the operator's data on attributing the glycerol to the correct source plant. If new sources are added, verification of the RED II criteria by a verifier satisfying the Member State's RED II competence criteria would be required.

## 4 DETERMINING THE BIOMASS FRACTION

This chapter is applicable only for stationary installations.



### 4.1 General approach

As discussed in more detail in guidance document No. 1 (General guidance for installations<sup>79</sup>), the EU ETS Directive allows that the emission factor of biomass is set to zero if RED II criteria are complied with (see section 3.4). This applies for accounting purposes only, while physically, still CO<sub>2</sub> is emitted from the installation. Therefore, and for transparency purposes, where biomass is involved, the emission factor must be determined from the preliminary emission factor and the biomass fraction of the fuel:

$$EF = EF_{pre} \cdot (1 - BF)$$

Where:

*EF* ..... Emission factor;

*EF<sub>pre</sub>* ..... Preliminary emission factor (i.e. according to Article 3(36), the “assumed total emission factor of a fuel or material based on the carbon content of its biomass fraction and its fossil fraction before multiplying it by the fossil fraction to produce the emission factor”);

*BF* ..... biomass fraction that complies with the RED II criteria [dimensionless].

**Note: This equation is valid because the emission factor of biomass (if it complies with the “RED II criteria”) is zero.** For a mixed material this formula requires that the *EF<sub>pre</sub>* is the weighted average value for the whole mixture. In that case, “determining the biomass fraction” means “determining the fraction of carbon in the mixture which is from biomass that complies with the RED II criteria”. The part of biomass which does not comply with those criteria has to be reported separately, but for emission calculation the above formula is correct. For reporting purposes,  $FF + BF_{non-REDII} + BF = 1$ , where *FF* is the fossil fraction, *BF<sub>non-REDII</sub>* the fraction of biomass carbon which is not complying with the RED II criteria, and *BF* the biomass fraction of carbon which is zero-rated. Section 10.17 of GD 1 contains an FAQ on how to report emissions from mixed fuels.



As GD 1 furthermore explains, for the purpose of emission monitoring using a calculation method, calculation factors can be determined either by using default values, or by laboratory analyses. The determination of the biomass or fossil<sup>80</sup> fraction of mixed fuels or materials is different from the determination of other calculation factors in three ways:

<sup>79</sup> For reference see section 1.3.

<sup>80</sup> Because Biomass fraction = 1 – fossil fraction, it is not important which fraction is determined by analysis. The operator can choose the simpler and more reliable methodology.

1. The biomass/fossil fraction is to be determined only if a source stream is not purely biomass or purely fossil<sup>81</sup>. In case of doubt or very small biomass fractions, the operator may apply a conservative approach and set the fossil fraction to 100% without further analysis (MRR Article 39(1)).
2. There is no list of default values in Annex VI of the MRR.
3. Laboratory analyses may be difficult due to sampling issues for heterogeneous materials, or may lack reliability due to technical issues of available analytical methods.

*New!*

Despite these differences, the MRR 2018 introduced tier definitions for the determination of the biomass fraction in Annex II, section 2.4, as follows:

Tier 1: Values published by the competent authority or the Commission, or values in accordance with Article 31(1), i.e. “Type I and Type II default values”<sup>82</sup>.

Tier 2: Estimation method approved by the competent authority<sup>83</sup>.

Tier 3: Laboratory analyses<sup>84</sup>.

Beyond these tier definitions, the MRR contains some special rules for determining the biomass fraction:

- The highest tier requirement is bespoke analyses as is the case for other calculation factors. However, a specific requirement is added here that the competent authority must explicitly approve the determination methodology, which must be based on relevant standards. See section 4.2 below.
- Where the highest tier is technically not feasible or would incur unreasonable costs (see GD 1, section 4.6), the operator shall use one of the following:
  - Use an estimation method published by the Commission, if available (at the time of writing this guidance, the Commission has not published any estimation methods), or
  - Propose an estimation method for the approval by the competent authority. In particular such estimation method may be a suitable mass balance where the material is originating from a known production process (such as e.g. wood-based panel wastes, where the amount of (fossil) resins added is a known process parameter). A mass balance as used under Article 30(1) of the RED II will also serve this purpose. Such mass balance information should be available from the supplier of the biomass together with evidence on sustainability and GHG savings criteria (see section 3.4). If the mass balance expresses biomass quantities in terms of energy instead of mass, section 4.3.2 should be consulted.
- The lowest tier (tier 1) is as usual the use of default values.
- However, it is always possible to use the conservative assumption that the fossil fraction is 100%, for which no tier applies (select “n.a.” in annual emissions report).

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<sup>81</sup> New subparagraph in MRR Article 30(2): “*The operator shall be required to determine the biomass fraction only for mixed fuels or materials. For other fuels or materials the default value of 0% for the biomass fraction of fossil fuels or materials shall be used, and a default value of 100% biomass fraction for biomass fuels or materials consisting exclusively of biomass.*”

<sup>82</sup> See section 6.2.1 of Guidance document 1.

<sup>83</sup> In accordance with the second subparagraph of Article 39(2).

<sup>84</sup> In accordance with the first sub-paragraph of Article 39(2), and in accordance with Articles 32 to 35.



More details on estimation methods are given in section 4.3.

## 4.2 Laboratory analyses for biomass fraction

For general requirements for laboratory analyses, please see Guidance document No. 5 (Guidance on Sampling and Analysis)<sup>85</sup>.



For the determination of the fossil and biomass carbon fraction in materials and fuels, Article 39(2) requires in particular: “Where subject to the tier level required, the operator has to carry out analyses to determine the biomass fraction, it shall do so on the basis of a relevant standard and the analytical methods therein, provided that the use of that standard and analytical method are approved by the competent authority.” This special highlighting of the competent authority’s approval will be discussed here.

For solid materials (usually waste), the relevant standard<sup>86</sup> according to the MRR is EN 15440 (“Solid recovered fuels – Methods for the determination of biomass content”). Where more specific national or international standards are available, they may be applied as well.

EN 15440 offers three methods for determining the biomass fraction of a mixed material:

1. The selective dissolution method;
2. The manual sorting method;
3. The <sup>14</sup>C method.

The informative Annex D of that standard shows that method 1 gives inappropriate and wrong results for several materials (i.e. fossil materials appearing to be biomass, or biomass identified as fossil). Method 2 is only applicable where optically and physically distinguishable fractions can be separated and quantified. The standard states that particle size should be >10mm. Under the standard, method 3 is applicable to all material types.

Therefore, the standard clarifies in section 6.3, that for determining biomass for the purpose of emission trading, “the <sup>14</sup>C method or the selective dissolution may be used.” The dissolution method must not be applied, if materials listed in Table 1 are contained at levels above 5% (for rubber residues the threshold is 10%).



EN 15440 acknowledges that the manual sorting and selective dissolution methods will usually be less expensive and simpler to apply than the <sup>14</sup>C method. Therefore the standard proposes that for routine checks for RES Directive purposes the two simpler methods may be applied (if materials listed in Table 1 are present below the mentioned thresholds only), with the <sup>14</sup>C method as reference method. The standard also points out that the sample preparation for the <sup>14</sup>C method should be simple enough for application in a reasonably equipped laboratory with normal skilled laboratory staff.

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<sup>85</sup> Please see section 1.3 for where to find other guidance documents.

<sup>86</sup> That standard has been replaced by EN ISO 21644:2021 (“Solid recovered fuels – Methods for the determination of biomass content”). However, this guidance document refers still to the old standard because it is explicitly mentioned in the MRR.

Table 1: *Materials for which the selective dissolution method is considered inappropriate according to EN 15440:2011.*

Solid fuels like hard coal, coke, brown coal, lignite and peat
Charcoal
Biodegradable plastics of fossil origin
Non-biodegradable plastics of biogenic origin
Oil or fat present as a constituent of biomass
Natural and/or synthetic rubber residues
Wool
Viscose
Nylon, polyurethane or other polymers containing molecular amino groups
Silicon rubber

Taking into account both the standard's requirements and Article 39(2) of the MRR, the following approach is proposed:

- Operators should strive for using the  $^{14}\text{C}$  method, at least for validation of the other methods used. The best cost/benefit balance may be found if the operator ensures correct sampling and sample preparation, which allows sending the sample to an accredited laboratory for the purpose of the  $^{14}\text{C}$  analyses.
- If the operator can show to the satisfaction of the competent authority that  $^{14}\text{C}$  analyses lead to unreasonable costs or are technically not feasible, the operator may use one of the two other methods of EN 15440, and provides evidence to the competent authority that
  - based on several representative samples the selected method has been validated using the  $^{14}\text{C}$  method, and
  - materials listed in Table 1 are found at levels below 5% (10% for rubber residues)..
- If such validation is not possible, but the  $^{14}\text{C}$  method would lead to unreasonable costs, the operator may use one of the lower tier approaches as discussed in section 4.1.



Note that due to the usual heterogeneous character of solid wastes, special care must be taken for sampling and sample preparation. Several standards of the EN 15000 series are referenced for this purpose in EN 15440, and therefore must be applied as appropriate.

For liquid fuels and materials, currently no European standard is available. However, it seems that the  $^{14}\text{C}$  method as given in EN 15440 should be applicable without great difficulties. Furthermore EN 16640 ("Bio-based products – Bio-based carbon content – Determination of the bio-based carbon content using the radiocarbon method") may be useful.



Furthermore, it should be noted that sampling of  $\text{CO}_2$  from the flue gas for the purpose of a  $^{14}\text{C}$  analysis can be a useful approach. In this case the biomass fraction determined would represent an average for the whole fuel mix. This approach would be in particular beneficial where highly heterogeneous materials

such as municipal waste are combusted. The MRR 2018 explicitly allows sampling based on EN ISO 13833 (Stationary source emissions — Determination of the ratio of biomass (biogenic) and fossil-derived carbon dioxide — Radiocarbon sampling and determination) in combination with Continuous Emission Measurement Systems (CEMS, see section 5.2).

## 4.3 Estimation methods

### 4.3.1 General approach

Regarding estimation methods which an operator may propose as tier 2 for the biomass fraction, there is a high degree of flexibility. In addition to estimating the biomass fraction as a separate factor for a single source stream, estimation methods for the overall biomass load of an emission source or source stream should be explored, such as the “balance method”<sup>87</sup>. However, where the reliability of the method is not certain, the operator should also provide for a method for corroborating the results.

FAQ No. 3 (see Annex III, section 9.3) gives some examples of estimation methods allowable pursuant to Article 39 MRR. Further methods may be approved by competent authorities, if they are based on scientifically proven methods. Preference should be given to methods at least partly referring to EN, ISO or national standards as well as to peer-reviewed publications.

### 4.3.2 Using RED II proofs of sustainability expressed as energy content

Under the EU ETS MRV rules, the activity data / quantity of materials is usually expressed in terms of mass, or for gases in volumes. However, the proof of sustainability by a certification scheme may be expressed in terms of energy content, in particular where it is linked to guarantees of origin, which are always issued in units of MWh. Where it relates to homogenous materials or fuels, this is no problem for the EU ETS operator. The linking element is the net calorific value (NCV, also known as lower heating value) which allows conversion from one unit to another<sup>88</sup>:

$$\text{Mass} = \text{Energy} / \text{NCV}$$

Furthermore, under the EU ETS, the biomass fraction of a mixed material relates to the fraction of carbon atoms in the material being from biomass. If a proof of sustainability expressed based on the energy content gives a certain “biomass fraction”, this is not directly usable under the EU ETS. Since the chemical bonds of the atoms in a substance have different bond energies, an exact treatment would give different values for the biomass fraction if it is calculated as energy content fraction instead of carbon mass fraction.

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<sup>87</sup> The balance method is based on five mass balances and one energy balance. Each balance describes a certain waste characteristic (e.g. content of organic carbon, heating value). The waste characteristics are derived from routinely measured operating data at the co-incineration plant.

<sup>88</sup> NCV values will usually be based on dry mass. However, the operator will have to ensure consistency of the state how data is given, and the state of a material in actual use.

There is no simple solution to this problem, unless the operator obtains sufficient information on the biomass material from the certification process. The mass balance approach under Article 30(1) of the RED II should keep track both of the mass as well as the energy content of the materials under consideration. However, where this is not possible, the operator would have to agree with the competent authority on another estimation method (using the information from the certification scheme), as allowed by Article 39(2) of the MRR.



In cases where the biomass and the fossil materials in a mixture have the same chemical composition (e.g. in a mixture of natural gas and biogas, where both are mainly composed of methane, or mixed liquid transport fuels consisting of a similar mixture of hydrocarbons from fossil and biomass sources), it is justified to use energy fraction values to determine the biomass fraction for the EU ETS.

## 5 OTHER SPECIFIC MRR RULES ON BIOMASS

This chapter is applicable only for stationary installations.



### 5.1 Simplifications by Article 38

Note: “Biomass” in this chapter means “*biomass for which compliance with sustainability and/or GHG savings criteria (the “RED II criteria”, see chapter 3) has been demonstrated, as relevant*”, since in accordance with Article 38(5) of the MRR, other biomass must be treated as if it were fossil.



In principle all source streams in an installation have to be monitored using the same system of tiers which are defined for the calculation based methodology. However, where biomass is contained in a source stream, the emissions stemming from this biomass are reported as zero, no matter how big the total emissions are. Adherence to reporting activity data and calculation factors to high accuracy in such cases could be counter to cost effectiveness.

The MRR therefore allows in Article 38 several simplifications:

- Where the whole source stream consists exclusively of biomass (i.e. 100% biomass and an absence of fossil contamination can be ensured, if applicable taking into account sustainability criteria), the operator may
  - take the biomass fraction to be 100% without carrying out further analyses (or estimation methods); and
  - determine the activity data without using tiers. This means that again an estimation method is allowed, similar to de-minimis source streams<sup>89</sup>. Although it is not explicitly mentioned in the MRR, the NCV and oxidation factor may also be determined using lower tiers or no-tier approaches.

Simplified!

However, it is clear that the operator has to provide some evidence about the biomass nature of the source stream to the competent authority when submitting the monitoring plan. Furthermore, the evidence for meeting any applicable RED II criteria (see chapter 3) has to be provided. If at the time of submitting the monitoring plan not all relevant information is available on the biomass or the sustainability scheme to be used, the operator will agree with the competent authority an appropriate way forward (such as updating the monitoring plan as soon as more information (e.g. after first delivery of the material) is available, or by using written procedures which can be updated with less effort than the monitoring plan. See GD 1 for more guidance on how to best set up monitoring plans).

- Where the fossil fraction of the emissions allows the source stream to qualify as a de-minimis source stream<sup>90</sup>, or where 97% or more of the carbon stems

<sup>89</sup> As the emissions of such a source stream are zero, the biomass source stream qualifies automatically as de-minimis source stream.

<sup>90</sup> The operator may select as de-minimis source streams: source streams which jointly correspond to less than 1 000 tonnes of fossil CO<sub>2</sub> per year or to less than 2% of the “total of all monitored items”, up to a total maximum contribution of 20 000 tonnes of fossil CO<sub>2</sub> per year, whichever is the highest in terms of absolute value. The “total of all monitored items” means the sum of source stream emissions including where outputs of mass balances are taken into account, absolute values, plus any emissions determined by CEMS. For more details see GD 1 (General guidance for installations). Note that the MRR 2018 requires that biomass must comply with the applicable RED II criteria to be zero-rated when classifying source streams.

from biomass (taking into account RED II criteria, where applicable), the same approach regarding use of no-tier methodologies including estimations may be applied. However, evidence must be provided regarding the fossil fraction in this case (see section 4 of this document).

The energy balance method is explicitly mentioned in the MRR as a possible no-tier estimation method, but other methods may be proposed by operators as well.

## 5.2 Biomass and CEMS

*New!*

The MRR 2012 assumed that it is not possible to continuously measure the biomass fraction of the emitted CO<sub>2</sub> with sufficient reliability. Therefore the MRR 2012 required as default approach that emissions from biomass should be determined by a calculation based approach, for subtracting them from the total emissions determined by measurement. However, Article 43(4) of the MRR 2018 allows not only calculation based approaches, but also

- Methods that use radiocarbon analyses of samples taken from the flue gas by continuous sampling. Note that formally this is a calculation based approach in MRR terminology, as it does not rely on continuous measurement. For this purpose, EN ISO 13833 “Stationary source emissions – Determination of the ratio of biomass (biogenic) and fossil-derived carbon dioxide – Radiocarbon sampling and determination” is to be applied;
- The “balance method”, which is an estimation method in MRR terminology (based on ISO 18466 “Stationary source emissions – Determination of the biogenic fraction in CO<sub>2</sub> in stack gas using the balance method”).
- Other estimation methods published by the Commission<sup>91</sup>.

Note that Article 43 clarifies that for the biomass monitored by such methods, Article 38(5) also applies. In other words, the RED II criteria (if applicable, see section 3.4.2) have to be met for allowing the zero-rating of the relevant biomass emissions. This may appear relatively burdensome at first sight. However, as long as all used biomass meets the RED II criteria, no quantification of individual source streams will be required (except for the corroborating calculation that must be done anyway). Where waste (in particular municipal solid waste) is used in an EU ETS installation, the demonstration of compliance with the relevant RED II criteria is relatively simple, as has been discussed in section 3.4.2. Therefore, only where a source stream is identified as not complying with the applicable RED II criteria, the use of a calculation based approach for determining the zero-rated amounts of biomass emissions will have to be indispensable.

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<sup>91</sup> At the time of updating this guidance, no such methods have been published.

## 5.3 Biogas in natural gas grids

When biogas (biomethane) is fed into a natural gas grid, it is physically mixed with and diluted by the natural gas and transported across the grid. It is uncertain, at which point of the grid it will be delivered to a consumer. However, specific EU ETS installations may want to make use of such biogas, which they may have purchased from a specified biogas producer or from a gas supplier. For handling this situation, the MRR provides a solution in Article 39(3) and (4):

- In principle, a monitoring approach using purchase records is allowed. However, in order to avoid double counting, it is not allowed to determine by laboratory analyses whether any biogas is physically delivered via the gas grid to the EU ETS installation.
- For the purchase based approach, Article 39(4) requires that the following conditions are met:
  - there is no double counting of the same biogas quantity, in particular that the biogas purchased is not claimed to be used by anyone else, including through a disclosure of a guarantee of origin as defined in Article 2(12) of Directive (EU) 2018/2001;
  - the operator and the producer of the biogas are connected to the same gas grid.

*New!*

It goes without saying that the applicable sustainability and GHG savings criteria have to be fulfilled for the biogas in question.

The MRR furthermore states that for demonstrating compliance with these criteria, the operator may use the data recorded in a database set up by one or more Member States which enables tracing of transfers of biogas, which means a “biogas registry” which ensures that every consignment of biogas is used only once. Theoretically, such databases could be made sufficiently compatible so that data exchange between Member States could ensure that biogas can be traded across country borders. Currently there is no single information system at the EU level for this purpose. However, the Union database being developed under the mandate of Article 28 of RED II will take the role of mass-balancing of liquid and gaseous fuels once fully operational.

In the following sub-sections, the most important aspects of the MRR’s provisions are discussed.

### 5.3.1 Member States’ approaches and biogas registries

The first thing to observe on biogas (biomethane) is that Member States have chosen different approaches to regulate its use. Because Member States are responsible for ensuring compliance with the RED II, operators of EU ETS installations who want to use biogas in line with Article 39(4) must ensure they have knowledge of the Member State’s approach and legislation. Knowledge to be obtained includes:

- Is there a biogas registry which can ensure that biogas is not double counted? If not, which other measures can be taken to track the use of biogas?

- Does the Member State allow the accounting of biogas produced in another Member State<sup>92</sup>?
- Does the Member State or its Registry issue biogas certificates which include information on sustainability, or guarantees of origin, or does it apply both systems?
- If there is a biogas registry, does it act like a mass balance system under Article 30(1) of the RED II, or does it issue certificates or GoOs that are traded independently from the physical gas quantities?

### 5.3.2 What are purchase records

For the purpose of Article 39(4), it is necessary that actual quantities of biogas can be traded between parties (producers, traders, consumers), and not only GoOs. Where the biogas registry acts as a mass balance within the meaning of the RED II, a certificate in the registry can be considered a purchase record. The proof of sustainability of a (recognised) certification scheme should be included in such certificate, or traded inseparably from the mass balance certificate.

In the absence of such a biogas registry, the operator of an EU ETS installation will have to use a supply contract for providing evidence of the purchase. In order to prove the quantity of purchased biogas, invoices will have to be demonstrated to the verifier, and upon request, to the competent authority. Furthermore the operator will have to receive the necessary evidence on sustainability and GHG savings from the supplier of the biogas, taking into account the full supply chain of biogas production.

### 5.3.3 Meaning of “the same grid”

The major part of the EU Member States’ natural gas grids are connected, and can therefore be considered to be under one single mass balance for the purpose of the RED II. However, when Article 39(4) is to be applied, it must be ensured that the purchase is actually reflected in the mass balance (as represented by biogas registries): Every MWh biogas purchased and claimed as used (either by an EU ETS installation or by any other consumer) must be removed/cancelled immediately from the mass balance, and for every MWh biogas produced, only one certificate must be generated.

For smaller natural gas grids which are not connected to the overall EU grid, it is still possible to use Article 39(4) of the MRR, but only if both the biogas producer and the biogas consumer are connected to the same grid, and if one mass balance is operated for this grid.

A special situation occurs where natural gas is transported by means other than pipelines (e.g. as liquefied gas) from the EU grid to a smaller, isolated grid. As long as that gas quantity can still be traced using a mass balance (e.g. by using a biogas registry), the condition of connection to the same grid may still be con-

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<sup>92</sup> That a Member State does not allow the accounting can happen e.g. if there is insufficient evidence that the biogas production is safeguarded against double counting, or if there is no system for statistical transfer in place, etc.



sidered fulfilled. Note, however, that emissions from the additional energy consumption (liquefaction and transport of the gas) will have to be taken into account in calculation of the GHG savings.

#### 5.3.4 Avoiding double counting

As mentioned in section 3.4.6.6, guarantees of origin can be traded independently from physical gas quantities. Therefore, if GoOs were accepted independently of purchase records, there is a risk that the same physical quantity of biogas could be claimed twice: once through GoOs and a second time through purchase records. For being sure that no such double counting can happen, one of the following approaches can be chosen:

- The Member State in which the biogas is produced, does not issue any GoO for biogas at all.
- The Member State requires immediate cancellation of GoOs at the time the biogas is sold to the end user, i.e. the EU ETS installation.
- The Member State that allows the use of MRR Article 39(4) requires the operator of an EU ETS installation to always cancel without undue delay biogas GoOs of the same quantity and consignment that the actual purchase record of biogas relate to.

These approaches are mutually exclusive, as otherwise more GoOs would be cancelled than biogas used. If the biogas producer and consumer are situated in the same Member State, this will likely not occur.

For the special case of an EU ETS installation consuming biogas that was produced in the same installation, double counting can be avoided by not generating any certificates or GoOs at all. However, if the Member State allows their generation, the Member State must also ensure that they are immediately cancelled again, as in all other cases of biogas use<sup>93</sup>.

#### 5.3.5 Biogas trading across MS borders

If cross-border biogas transfers should happen, it is important that all participating Member States agree to the same approach regarding certificates in their registries (see previous sub-section). Furthermore, the biogas registries of all participating Member States must be technically compatible (otherwise the transfers would require human intervention, which is intrinsically prone to error). All participating registries must ensure that the certificate for biogas transferred out of the Member State is immediately cancelled, and that for each imported biogas quantity, the correct number of new certificates is generated. The information on the certificates (such as biogas producer, raw materials, proofs of sustainability, etc.) must be passed on to the next registry without modification.

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<sup>93</sup> RED II Article 19(2): "To that end, Member States shall ensure that a guarantee of origin is issued in response to a request from a producer of energy from renewable sources, unless Member States decide, for the purposes of accounting for the market value of the guarantee of origin, not to issue such a guarantee of origin to a producer that receives financial support from a support scheme. [...]"

*In order to take into account the market value of the guarantee of origin, Member States may, inter alia, decide to issue a guarantee of origin to the producer and immediately cancel it."*

At the time of writing this guidance, not all Member States have registries that fulfil these requirements. However, there are two initiatives which may help EU ETS operators to make use of biogas:

- The European Renewable Gas Registry (ERGaR<sup>94</sup>) is working on the promotion of standards which serve the purpose of transferring biogas mass balance certificates and GoOs between connected Member States' biogas registries. ERGaR applied for recognition by the Commission as a voluntary scheme (with the scope focussed on the transfer between registries only). As recognised schemes have to accept certificates and proof of sustainability on other parts of the value chain from other recognised schemes, this would complement other voluntary schemes in this one missing link in the supply chain.
- Pursuant to Article 28(2), the Commission is to set up a Union database for tracing liquid and gaseous transport fuels. This is currently under development, and little is known yet on its functioning. Furthermore, it would currently not cover the trade of biogas with an EU ETS installation as consumer, since it is meant only for transport fuels. However, according to the "Fit for 55" proposal by the Commission for revision of the RED II, this database would be extended to cover all biogas fed to the natural gas grid.

**Note:** The above considerations relate to the trade of biogas between companies. If trade is done across Member State borders, this will mean that EU ETS emissions are reduced in the Member State of the consuming installations compared to if natural gas were used, and the physical consumption of the biogas in the producing Member State will not lead to the intended emission reduction. On the other hand, if this trade is not reflected in energy statistics, the biogas could still count towards the renewable energy target of the producing Member State. Therefore, a "statistical transfer" pursuant to Article 8 of the RED II would have to be made between Member States. This could use information created by the biogas registries. However, it will not happen automatically<sup>95</sup>. However, as it is not an EU ETS issue, this is outside the scope of this guidance document.

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<sup>94</sup> <https://www.ergar.org/>

<sup>95</sup> Based on current knowledge at the time of writing this document.

## 6 AVIATION SPECIFIC ASPECTS

This chapter has now been transferred to Guidance document No. 2 (“General guidance for Aircraft Operators”<sup>96</sup>). It applied only to aircraft operators’ activities covered by the EU ETS.



In the context of aviation and the EU ETS, two issues are of relevance:

1. How to apply sustainability and GHG savings criteria? (see section 6.1)
2. How to account for biofuel purchases in a pragmatic way? (see section 6.2)

### 6.1 Sustainability and GHG savings criteria

Regarding the sustainability criteria, in principle everything discussed in section 3.4 is applicable. Because of the international character of the aviation sector, aircraft operators should in particular strive for receiving evidence based on voluntary schemes recognised by the Commission. Section 3.4 is now contained in GD 2 as an annex.

### 6.2 Biofuel determination based on purchase records

Article 54(3) of the MRR allows that aircraft operators determine the quantity of biofuels used based on purchase records, provided the aircraft operator provides evidence to the competent authority that there is no double counting of those biofuels. For that purpose, the aircraft operator may make use of the Union database set up in accordance with Article 28(2) of the RED II. More information is provided in Guidance Document No. 2.

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<sup>96</sup> For where to find this document on the Commission’s website please see section 1.3.

## 7 ANNEX I

### 7.1 List of biomass materials

This informative Annex has been added as guidance for interpretation of the MRR's definition of biomass. The lists below are non-exhaustive. Thus, if a material or fuel is not found on the list, the individual case must be assessed based on the definitions of the MRR (see section 3.2).

#### 7.1.1 Clarification for some non-biomass materials

Peat, xylite<sup>97</sup> and fossil fractions or contaminations of the materials below are not biomass (see Article 38(3)).

#### 7.1.2 Biomass materials



**Note:** For all materials listed below it must be taken into account if sustainability criteria and GHG savings criteria of the RED II are applicable. (see section 3.4.2).

If RED II criteria apply, the material only qualifies as biomass within the meaning of the MRR (i.e. with an emission factor of zero) if evidence for meeting the applicable sustainability and GHG savings criteria is provided.

Note: If the materials listed contain fossil materials (such as in the case of waste wood containing varnishes, colours, resins, etc), these materials have to be treated as mixed materials.

#### Group 1: Plants and parts of plants:

- straw;
- hay and grass;
- leaves, wood, roots, stumps, bark;
- crops, e.g. maize and triticale.

#### Group 2: Biomass wastes, products and residues:

- industrial waste wood (waste wood from woodworking and wood processing operations and waste wood from operations in the wood materials industry);
- used wood (used products made from wood, wood materials) and products and by-products from wood processing operations;
- wood-based waste from the pulp and paper industries, e.g. black liquor (with only biomass carbon);
- crude tall oil, tall oil and pitch oil from the production of pulp;
- forestry residues;
- lignin from the processing of plants containing ligno-cellulose;

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<sup>97</sup> This is a by-product of lignite coal production.

- animal, fish and food meal, fat, oil and tallow;
- primary residues from the food and beverage production;
- plant oils and fats;
- manure;
- agricultural plant residues;
- sewage sludge;
- biogas produced by digestion, fermentation or gasification of biomass;
- harbour sludge and other waterbody sludges and sediments;
- landfill gas;
- charcoal;
- natural rubber or latex.

**Group 3: Biomass fractions of mixed materials:**

- the biomass fraction of flotsam from waterbody management;
- the biomass fraction of mixed residues from food and beverage production;
- the biomass fraction of composites containing wood;
- the biomass fraction of textile wastes;
- the biomass fraction of paper, cardboard, pasteboard;
- the biomass fraction of municipal and industrial waste;
- the biomass fraction of black liquor containing fossil carbon;
- the biomass fraction of processed municipal and industrial wastes;
- the biomass fraction of ethyl-tertiary-butyl-ether (ETBE);
- the biomass fraction of butanol;
- the biomass fraction of waste tyres resulting from natural rubber and fibres.

**Group 4: Fuels whose components and intermediate products have all been produced from biomass<sup>98</sup>:**

- bioethanol;
- biodiesel;
- etherised bioethanol;
- biomethanol;
- biodimethylether;
- bio-oil (a pyrolysis oil fuel) and bio-gas;
- hydro-treated vegetable oil (HVO).

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<sup>98</sup> Where a fraction of the carbon contained in these substances stems from fossil sources, such as e.g. when biodiesel is produced using methanol produced from fossil sources, these substances must be treated as mixed materials.

## 7.2 List of default values for calculation factors for some biomass materials

### 7.2.1 Preliminary emission factors

Article 38(2) of the MRR makes reference to the use of the preliminary emission factor<sup>99</sup> for mixed materials and fuels. However, the MRR does not contain default values for the preliminary emission factors. Therefore, operators may find it difficult to report these values<sup>100</sup>. Furthermore such default values might be needed for biomass materials where evidence for meeting sustainability criteria (if applicable) cannot be provided. The following values taken from the IPCC 2006 guidelines (lowest tier approach) may be useful for this purpose<sup>101</sup>. However, the IPCC guidelines also give ranges for those values which may be broad in particular for biomass. Competent authorities should therefore request operators to validate the appropriateness of default values by laboratory analyses, taking into account the total amount of emissions from this source stream such that unreasonable costs are avoided. For higher tiers, there may be better values available from the relevant competent authority.

Note that for the application of the preliminary emission factor a FAQ is provided<sup>102</sup>. The Commission's template for the Annual Emission Report further clarifies the issue.

Biomass material	Preliminary EF [t CO <sub>2</sub> / TJ]	NCV [GJ/t]
Wood / Wood waste (air dry <sup>103</sup> )	112	15.6
Sulphite lyes (black liquor)	95.3	11.8
Other primary solid biomass	100	11.6
Charcoal	112	29.5
Biogasoline	70.8	27.0

<sup>99</sup> According to Article 3(36) of the MRR, the preliminary emission factor is “the assumed total emission factor of a fuel or material based on the carbon content of its biomass fraction and its fossil fraction before multiplying it by the fossil fraction to produce the emission factor”. This is to be distinguished from the [final] emission factor, which by definition is zero for biomass. For further details see section 4.3.1 of Guidance Document No. 1, and the FAQ No.1 in this document (section 9.1).

<sup>100</sup> According to point 8(b) of Annex X of the MRR, operators are required to report CO<sub>2</sub> emissions from biomass as memo item where a measurement based methodology is used to determine emissions. This is achieved in a simple way if the preliminary emission factor is reported together with the biomass fraction (the latter being a reporting requirement given by point 6(f) of the same Annex).

Note: This approach of reporting is inter alia necessary for supporting the accurate determination of biomass emissions in the national GHG inventory.

<sup>101</sup> The full guidelines, including inter alia definitions for these fuels, can be found at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>

<sup>102</sup> See FAQ 1 in section 9.1.

<sup>103</sup> The given emission factor assumes around 15% water content of the wood. Fresh wood can have water content of up to 50%. For determining the NCV of completely dry wood, the following equation should be used:

$$NCV = NCV_{dry} \cdot (1 - w) - \Delta H_v \cdot w$$

Where  $NCV_{dry}$  is the NCV of the absolute dry material,  $w$  is the water content (mass fraction) and  $\Delta H_v = 2.4 \text{ GJ/t } H_2O$  is the evaporation enthalpy of water. Using the same equation, the NCV for a given water content can be back-calculated from the dry NCV.

Biomass material	Preliminary EF [t CO <sub>2</sub> / TJ]	NCV [GJ/t]
Biodiesels <sup>104</sup>	70.8	37.0
Other liquid biofuels	79.6	27.4
Landfill gas <sup>105</sup>	54.6	50.4
Sludge gas <sup>105</sup>	54.6	50.4
Other biogas <sup>105</sup>	54.6	50.4
Municipal waste (biomass fraction) <sup>106</sup>	100	11.6

## 7.2.2 Mixed materials

An information exchange between Member States and the Commission has not yet resulted in a further need to provide default values for specific mixed materials. As an exception, default values for waste tyres are discussed in FAQ No. 2 (see section 9.2).

<sup>104</sup> The NCV value is taken from Annex III of the RED II.

<sup>105</sup> For landfill gas, sludge gas and other biogas: Standard values refer to pure Biomethane. For arriving at the correct default values, a correction is required for the methane content of the gas.

<sup>106</sup> The IPCC guidelines also give values for the fossil fraction of municipal waste:  
EF = 91.7 t CO<sub>2</sub>/TJ; NCV = 10 GJ/t

## 8 ANNEX II – ACRONYMS AND LEGISLATION

### 8.1 Acronyms

AER	.....Annual Emissions Report
AVR	.....Accreditation and Verification Regulation
CA	.....Competent Authority
CEMS	.....Continuous Emission Measurement System
EU ETS	.....EU Emission Trading System
MP	.....Monitoring Plan
MPE	.....Maximum Permissible Error (term usually used in national legal metrological control)
MRR	.....Monitoring and Reporting Regulation
MRV	.....Monitoring, Reporting and Verification
MRVA	.....Monitoring, Reporting, Verification and Accreditation
Permit	.....GHG emissions permit
RED I	.....(first) RES Directive (2009/28/EC)
RED II	.....Recast RES Directive: Directive (EU) 2018/2001 If RED without number is mentioned, this document usually refers to RED II
RES	.....Renewable Energy Sources (Directive)

### 8.2 Legislative texts

**EU ETS Directive:** Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC, amended several times. Download of the consolidated version: <https://eur-lex.europa.eu/eli/dir/2003/87/2020-01-01>

**MRR:** Commission Implementing Regulation 2018/2066 of 19 December 2018 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council and amending Commission Regulation (EU) No. 601/2012. Download the consolidated version under [https://eur-lex.europa.eu/eli/reg\\_impl/2018/2066](https://eur-lex.europa.eu/eli/reg_impl/2018/2066)

**AVR:** Commission Implementing Regulation (EU) 2018/2067 of 19 December 2018 on the verification of data and the accreditation of verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council. Download of consolidated version: [https://eur-lex.europa.eu/eli/reg\\_impl/2018/2067/2021-01-01](https://eur-lex.europa.eu/eli/reg_impl/2018/2067/2021-01-01)



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

Download: <http://eur-lex.europa.eu/eli/dir/2009/28/> (Repealed)

**RED II:** Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast). Download under:

<https://eur-lex.europa.eu/eli/dir/2018/2001/oj>

**Implementing acts** under RED II:

- 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,  
[http://data.europa.eu/eli/reg\\_impl/2022/996/oj](http://data.europa.eu/eli/reg_impl/2022/996/oj)
- Commission Implementing Regulation (EU) .../... of XXX 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;  
At the time of writing this guidance, the finalised text (pending publication in the official journal of the EU) is available at <https://ec.europa.eu/transparency/comitology-register/core/api/integration/ers/294191/083454/2/attachment>

## 9 ANNEX III: FREQUENTLY ASKED QUESTIONS

### 9.1 What is the “preliminary” emission factor and how is it determined?

Article 3(36) of the MRR defines: ‘preliminary emission factor’ means the assumed total emission factor of a fuel or material based on the carbon content of its biomass fraction and fossil fraction before multiplying it by the fossil fraction to produce the emission factor.

This means that the *preliminary emission factor* is the factor, expressed as t CO<sub>2</sub> / TJ or t CO<sub>2</sub> / t, which reflects the total CO<sub>2</sub> released into the atmosphere by the combustion of the fuel or conversion of the material, regardless of whether the CO<sub>2</sub> is stemming from fossil or biomass carbon. Where the preliminary emission factor is determined by analyses in accordance with Articles 32 to 35 (tier 3), this emission factor is determined the same way as for purely fossil fuels or materials by determining the total carbon content. Where default values are used for the determination of the preliminary emission factor, relevant sources are *inter alia* MRR Annex VI (tier 1), section 7.2.1 of this document or other values used in the IPCC Guidelines or in the National Inventory (tier 2a).

#### Example:

An installation is burning wood-based panels waste. The carbon content of the waste wood panels is analysed: Carbon Content (CC) = 0.5 t C/t waste. 95% of the carbon contained in this source stream is stemming from biomass (the fossil carbon is contained in the resins used for gluing the wood fibres). The net calorific value (NCV) is determined to be 15 GJ/t waste.

To determine the preliminary emission factor ( $EF_{pre}$ ) expressed as t CO<sub>2</sub>/TJ, the following equation is used (see section 6.3.1 of Guidance Document 1):

$$EF_{pre} = CC_{total} \cdot f / NCV$$

With factor  $f$  being 3.664 t CO<sub>2</sub>/t C, the preliminary emission factor ( $EF_{pre}$ ) is 122 t CO<sub>2</sub>/TJ. It corresponds to the total CO<sub>2</sub> emitted from this source stream regardless whether it is stemming from fossil or biomass sources.

The EU ETS reportable emissions are calculated by (for detailed description see section 4.3.1 of Guidance Document 1):

$$Em = FQ \cdot NCV \cdot EF_{pre} \cdot (1 - BF) \cdot OF$$

The fact that 95% of this CO<sub>2</sub> is stemming from biomass is taken into account by the term “1 minus biomass fraction” (1-BF). The biomass fraction is defined as the ratio of carbon stemming from biomass to the total carbon content of a fuel or material. Hence, this is also the ratio of CO<sub>2</sub> emitted stemming from biomass to the total CO<sub>2</sub> emitted.

Note that sustainability and GHG savings criteria apply (see section 3.4). If those criteria are not satisfied, the biomass fraction shall be assumed to be zero, i.e. all carbon is treated as if it were fossil. In that case, BF=0 and the preliminary emission factor is equal to the final emission factor.

## 9.2 Biomass fraction for waste tyres

Tyres are composed in principle of:

1. Steel carcasses,
2. Textiles (often viscose filament fibres, i.e. biomass),
3. Natural latex,
4. Synthetic latex,
5. Carbon black,
6. Other filler materials (often inorganic).

Only point 3 and (part of) point 2 qualify as biomass. However, composition of tyres varies widely across manufacturers and tyre type (car, truck, tractor). Manufacturers are keeping composition data strictly confidential, and analyses are very demanding due to the virtual impossibility of representative sampling.

Thus, it is advisable to develop default values at the national level, or even EU level, if sufficient data can be collected from Member States. Typical values informally reported are in the range of

- Carbon content = [60...75]%
- NCV = [25...35] GJ/t
- Preliminary emission factor = [80...90] t CO<sub>2</sub>/TJ
- Biomass fraction = [20...30]%

***[Note: More data is required for substantiating any proposal for default values or at least for narrowing the intervals]***

In the absence of more reliable data, the most conservative values have to be used, i.e. high preliminary EF and low biomass fraction, unless evidence for more representative values can be provided by the operator. It is recalled that Article 24(1) requires the corresponding NCV to be consistent with this EF<sup>107</sup>.

## 9.3 What are suitable estimation methods to determine the biomass fraction?

According to Article 39 an estimation method may be proposed to the competent authority for approval, if:

- Analysing the biomass fraction by using appropriate standards<sup>108</sup> is technically not feasible or would incur unreasonable costs, provided that tier 3 for the biomass fraction is required for the specific source stream by the MRR, and

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<sup>107</sup> Please note that Annex VI(1) is providing a default value for the preliminary emission factor of waste tyres (85.0 t CO<sub>2</sub>/TJ). This means that if an operator wants to use this EF he has to provide evidence that the proposed default value for the NCV for waste tyres is consistent with this EF. For details on this consistency criterion see guidance document No.1 section 6.2.

<sup>108</sup> The MRR does not mention specific standards. Appropriate standards may be EN 15440, EN 16640, EN ISO 13833, etc.

- There are neither suitable default values for emission factor and biomass fraction for mixed fuels and materials nor estimation methods published by the Commission.

Allowed estimation methods must be based on scientifically proven methods. Therefore, a literature research should be carried out giving preference to methods at least partly referring to EN, ISO or national standards as well as to peer-reviewed publications.

A peer-reviewed paper providing a suitable estimation method for determining the biomass fraction has been published for waste-to-energy processes<sup>109,110</sup>. This so-called “balance method” is based on a mass balance (distinguishing between biogenic, fossil, inert fractions and moisture content), including an ash and carbon balance and an energy balance. Furthermore, the O<sub>2</sub> consumption as well as the difference between O<sub>2</sub> consumption and CO<sub>2</sub> emission is relevant. Where different fossil sources are used, determining the correct difference between O<sub>2</sub> consumption and CO<sub>2</sub> emission needs to be adjusted by the correct stoichiometric relations, since this method focuses on wastes and assumes that polyethylene is the main fossil source. The advantage of the described method is that it is based on parameters which need monitoring for process control reasons anyway, even if the installation is not covered by the EU ETS.

For fuels or materials originating from a production process with defined and traceable input streams, e.g. waste wood panels or biodiesel, Article 39(2) allows the operator to base such estimation on a mass balance of fossil and biomass carbon entering and leaving the process<sup>111,112,113</sup>.

Please note that the abovementioned estimation method is different from the “energy balance method” which Article 38(4) allows for estimating emissions for mixed fuels or materials with a biomass content equal to or higher than 97%. Article 3(39) defines the “*energy balance method means a method to estimate the amount of energy used as fuel in a boiler, calculated as sum of utilisable heat and all relevant losses of energy by radiation, transmission and via the flue gas.*” This method in principle is based on a complete energy balance of a boiler allowing emissions to be related directly to individual input materials. A suitable basis for such an approach is EN 12952-15 “Water-tube boilers and auxiliary installations – Part 15: Acceptance tests.” This standard describes principles for calculating the boiler efficiency as well as formulae for calculating relevant flue gas parameters. This “energy balance method” gives the mass and heat flow of the fuel consumed as the result, allowing the determination of emissions from analysis of the fuel. It is only suitable for estimating emissions for mixed fuels or materials with a biomass content equal to or higher than 97%. It is not applicable for

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<sup>109</sup> [Fellner J, Cencic O, Rechberger H](#). “A new method to determine the ratio of electricity production from fossil and biogenic sources in waste-to-Energy plants.” [Environ Sci Technol](#). 2007; 41(7); p. 2579-2586.

<sup>110</sup> [Obermoser M, Fellner J, Rechberger H](#). “Determination of reliable CO<sub>2</sub> emission factors for waste-to-energy plants.” [Waste Manag Res](#). 2009; 27(9); p. 907-913.

<sup>111</sup> <https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-template-methodology-measuring-fossil-derived-contamination-within-waste-wood>

<sup>112</sup> <https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-fuel-measurement-and-sampling-guidance-may-2013>

<sup>113</sup> <https://www.ofgem.gov.uk/publications-and-updates/renewables-obligation-biodiesel-and-fossil-derived-bioliquids-guidance-may-2013>

mixed fuels with a biomass content lower than 97% or for determination of the biomass fraction of such a fuel.

Furthermore there have been attempts to use <sup>14</sup>C analyses on samples continuously collected from exhaust stacks. Such sampling and related analyses can be performed based on EN ISO 13833 (“Stationary source emissions – Determination of the ratio of biomass (biogenic) and fossil-derived carbon dioxide – Radiocarbon sampling and determination”). If a competent authority considers approval of such methodology under Article 39 MRR, it must take into account that such approach is difficult (it requires e.g. sampling proportional to the gas flow) and will therefore require a laboratory experienced and accredited for this specific approach. Furthermore it must not be confused with CEMS, since there are few data points generated over a longer period of time. Finally, due to the difficulty of this approach, a reliable method for determining biomass and fossil emissions must be available as backup for avoiding data gaps.

## 9.4 How to report emissions from mixed (fossil-biomass) materials?

How should the fossil and biomass-related emissions of the following (hypothetical) mixed fuel be determined and reported? An installation produces mixed pellets before using them in a boiler that was formerly fired by coal.

The Installation uses the following raw materials for producing the pellets:

- Plastic waste (mostly polyethylene) – 25% of the total input by weight, fossil.
- Imported forest residues (small cut branches from hard wood) – 40% of input by weight. The operator receives these residues from a source in a third country without evidence whether the land-related sustainability criteria are met. Therefore the operator has to consider them as non-sustainable biomass.
- Residues (bark) of locally harvested wood – 35% of input by weight; certified by a voluntary scheme, therefore counted as sustainable biomass and zero-rated.

The input materials have the following properties:

Raw material	Fossil or biomass?	Input to Mix	Moisture (water content) in t H <sub>2</sub> O/t fuel	C content in t C / t dry fuel	NCV in GJ / t dry fuel
Polyethylene	Fossil	25%	0%	86%	40.2
Hard wood residues	non-sust. biomass	40%	30%	50%	18
Wood wastes (bark)	sustainable biomass	35%	45%	46%	17

During processing to pellets, the mixture is partly dried such that the wood components contain only 8% water in the end (the polyethylene is assumed to remain completely dry). The operator calculates the properties of the components in the final pellets as follows:

Pellet Mixture	Content in mix	Moisture (water content in t H <sub>2</sub> O/t component)	C content in t C / t fuel	NCV GJ / t fuel	(prelim.) EF t CO <sub>2</sub> / TJ
Polyethylene	32.7%	0%	86.0%	40.2	78.4
Hard wood residues	39.9%	8%	46.0%	16.4	102.8
Wood wastes (bark)	27.4%	8%	42.3%	15.4	100.6

Note: For this calculation it is taken into account that the total mass decreases due to the drying. Therefore the relative quantities of the materials in the mix change. For calculating the NCV based on the moisture content, the following equation is used:

$$NCV = NCV_{dry} \cdot (1 - w) - \Delta H_v \cdot w$$

Where  $NCV_{dry}$  is the NCV of the absolute dry material,  $w$  is the water content (mass fraction) and  $\Delta H_v = 2.4GJ/t H_2O$  is the evaporation enthalpy of water.

Using the above individual components, the operator can calculate the emissions and energy input from combusting 1000 t of these pellets. The percentage in the total emissions can be used to calculate the carbon content percentage attributed to each component:

Pellet mixture (1000 t)	Fossil or biomass?	Emissions in t CO <sub>2</sub>	Energy in TJ	% of emissions = % of C content
Polyethylene	fossil	1030.4	13.1	48.4%
Hard wood residues	non-sustainable Biomass	672.5	6.5	31.6%
Wood wastes (bark)	Sustainable Biomass	424.7	4.2	20.0%
<b>Total</b>		<b>2127.6</b>	<b>23.8</b>	<b>100%</b>

In the annual emission report, the operator may choose to report these three components separately, which has the advantage of transparency and avoiding the need to calculate with different moisture contents. With the latter approach, the operator may use directly emission factor and NCV of the moist (as received) biomass.

Alternatively, there is also the possibility to calculate weighted carbon content / preliminary emission factor and NCV from the final pellets (in particular useful if e.g. the operator also sells part of the pellets and wants to inform the customers of their properties).

From the above, the operator may calculate (using  $f = 3.664$  t CO<sub>2</sub>/t C):

- The weighted NCV = 23.8 GJ/t pellets
- Carbon content:  $CC = 2127.6$  t / 1000 t /  $f = 58.1\%$
- Weighted (preliminary) emission factor  $EF = CC \times f / NCV = 89.39$  t CO<sub>2</sub> / TJ

Using these calculation factors and the percentages of the fossil and biomass fractions given in the previous table, the operator can fill the annual emissions report using one single source stream:

1	<b>F1. Solid - Other solid fuels; Mixed plastic/Wood pellets</b>			<b>Combustion</b>	CO2 fossil:	1.702,0	t CO2e
	Combustion: Solid fuels				CO2 bio:	425,5	t CO2e

	Tier	tier description	Unit	Value	error
iii. AD:	3	± 2,5%	t	1.000,00	
iv. (prelim) EF:	2a	Type II default values	tCO2/TJ	89,39	
v. NCV:	2a	Type II default values	GJ/t	23,8	
vi. OxF:	1	Default value OF=1	-	100,00%	
vii. ConvF:					
viii. CarbC:					
ix. BioC:	2	Type II biomass fraction	-	20,00%	
x. non-sust. BioC:	2	Type II biomass fraction	-	31,60%	

## 9.5 Waste-related FAQs

### 9.5.1 Is municipal sewage sludge a municipal solid waste?

The answer is no: The Waste Framework Directive<sup>114</sup> Article 3(2b) explicitly excludes sewage sludge in the definition of municipal waste:

*'municipal waste' means:*

(a) mixed waste and separately collected waste from households, including paper and cardboard, glass, metals, plastics, biowaste, wood, textiles, packaging, waste electrical and electronic equipment, waste batteries and accumulators, and bulky waste, including mattresses and furniture;

(b) mixed waste and separately collected waste from other sources, where such waste is similar in nature and composition to waste from households;

**Municipal waste does not include** waste from production, agriculture, forestry, fishing, septic tanks and sewage network and treatment, including **sewage sludge**, end-of-life vehicles or construction and demolition waste.

Note: Sewage sludge is not necessarily biomass. Where the carbon content of the waste water stems from fossil sources, also the sewage sludge will contain a fraction that can be identified as fossil when using <sup>14</sup>C analyses.

### 9.5.2 Which RED II criteria apply to landfill gas?

Like sewage sludge, landfill gas is not necessarily 100% biomass (see previous question). As the origin of landfill gas is clearly the anaerobic decomposition of waste, the general rule for waste applies that only GHG savings are to be demonstrated. As the gas is sourced from waste (life cycle emissions are zero) at the same site (the landfill, transport emissions to that point are zero), it is only a formality to demonstrate that the GHG savings for the biomass fraction of the landfill gas are fulfilled. However, if the waste is not generated at the same site as the landfill, the emissions from transport from the collection point to the landfill would have to be taken into account. Whether a certification system has to be used in such cases depends on national requirements.

<sup>114</sup> Directive 2008/98/EC as amended by Directive (EU) 2018/851.

### **9.5.3 Which RED II criteria apply to sewage sludge and biogas produced from it?**

As has been stated under 9.5.1, sewage sludge is only biomass if the carbon content in the waste water stems from biomass. This may e.g. be the case in food industries (slaughterhouses, breweries, etc.), but even there it is not excluded that chemicals based on fossil sources. A mass balance of all materials used at the industrial site would provide insight, where analyses are not technically feasible or lead to unreasonable costs.

Regarding RED II criteria applied to the gas from sewage sludge digestion, the situation will be similar as for landfill gas (see 9.5.2), i.e. no land-related sustainability criteria apply, and GHG savings can be easily demonstrated (except if the sewage sludge is transported over long distances from the collection point to the installation for anaerobic digestion). Whether a certification system has to be used in such cases depends on national requirements.

### **9.5.4 Which RED II criteria apply to fuels produced from municipal solid waste?**

According to MRR Article 38(5), “*electricity, heating and cooling produced from municipal solid waste shall not be subject to the criteria*” of the RED II. However, if municipal solid waste is used to produce biofuels, bioliquids or biomass fuels, the rule applies that only GHG savings criteria have to be fulfilled (in the case of solid or gaseous biomass fuels, this applies only if used in installations starting after 2020).

For the production of such fuels, life cycle emissions of the municipal solid waste itself are considered as zero. Only emissions from processing into the fuel, from transport from the collection point to the point of use, and emissions from its use need to be taken into account in the calculation as described in section 3.4.6.2.

Notably, it needs to be taken into account that this applies only to the biomass fraction of the municipal waste.

### **9.5.5 Which RED II criteria apply to waste tyres?**

Where waste tyres contain a biomass fraction, the RED II criteria in principle apply. As waste tyres are neither agricultural nor forestry biomass, only GHG saving criteria apply (only if the installation started operations after 1 January 2021, meaning that biomass was first used after that year, see section 3.4.6.2). Life cycle emissions of the waste tyres need to be calculated as described in section 3.4.6.2. The emissions up to the point of collection of the waste tyres are considered as zero. Only emissions from potential processing into the fuel (e.g. shredding), from transport from the collection point to the point of use, and emissions from their use need to be taken into account in the calculation.

### **9.5.6 Which criteria apply to impregnated sawdust?**

According to the definitions of the RED II (see section 3.2) and what has been discussed in section 3.4.6.4, a case-by-case decision may be required for whether saw dust is a residue or waste from forest-related industries. If a sawdust



does not comply with the definition of “residues from agriculture, aquaculture, fisheries or forestry” because it stems from an industrial activity, the land-related sustainability criteria do not have to be demonstrated. GHG savings are to be assessed as described in section 3.4.6.2).

Regarding the impregnation, it needs to be decided, if the impregnating substances have been added intentionally in order to make the material a waste. If that is the case, the impregnated sawdust would not qualify as waste under the MRR. If on the other hand the “impregnation” stems from fossil oil because the saw dust was used to absorb the oil for removing it from surfaces, the purpose of that oil is not to intentionally making the sawdust a waste.

If the material used for impregnation is of fossil origin, the biomass fraction must be determined in line with section 4.

### **9.5.7 Which criteria apply to agricultural products becoming wastes due to a contamination?**

A case-by-case decision by the competent authority may be required. If the contamination was done intentionally in order to make the material a waste, the same criteria apply as if the agricultural material without contamination were under assessment, since in this case it does not qualify as waste under the MRR (see definitions in section 3.2). However, if the contamination has happened unintentionally, only GHG savings have to be assessed.

If the contaminating material is of fossil origin, the biomass fraction of the mixture must be determined in line with section 4.

### **9.5.8 Can the European waste catalogue help in classifying materials?**

The Commission’s guidance on the Waste Framework Directive (see section 3.4.6.4) states that the fact that a material can be classified using the European waste catalogue is not sufficient to establish if the material is actually waste. Similarly, knowing that a material is waste is not sufficient for classifying it using the waste catalogue, as the source of the waste has to be known. It must furthermore be noted that there are waste categories which are from agriculture or forestry, but are not even biomass (e.g. pesticide wastes).

Therefore, the answer is: No, the waste catalogue is not a sufficient tool to identify certain wastes from forestry or agriculture.

### **9.5.9 How to classify agricultural wastes?**

Example: Biomass coming from olive pits and other olive waste.

Question 1: Does such material qualify as “agricultural, aquaculture, fisheries and forestry residues”? Answer: No. Olives are processed in (industrial) installations, i.e. the residues do not comply with the definition of article 3(21e) of the MRR (see section 3.2).

Question 2: Is such material a waste or a residue? Guidance on this question is given in section 3.4.6.4. A residue is usually something that still has some economic value, while for being waste, the criterion is that the holder discards or

intends or is required to discard it. Furthermore the RED II prohibits that a waste is generated by intentionally modifying a material for becoming waste.

In case of doubt the competent authority has to decide based on national legislation. Another option is that a RED certification scheme recognised by the Commission provides a proof of sustainability which confirms the material's status under RED II rules.

## 9.6 Oxidation and conversion factors of mixed materials

Question: In a (combustion) process using several biomass fuels and fossil fuels, or where mixed fuels are used, some carbon remains in ashes, slags, or e.g. in the cement clinker produced, this is usually taken into account by an oxidation factor (or in the case of cement clinker, by a conversion factor) of lower than 100%. How should this factor be determined considering that some of the not emitted carbon may stem from biomass?

Answer: MRR Article 37(2) reads:

*“Where several fuels are used within an installation and tier 3 is to be used for the specific oxidation factor, the operator may ask for the approval of the competent authority for one or both of the following:*

- (a) the determination of one aggregate oxidation factor for the whole combustion process and to apply it to all fuels;*
- (b) the attribution of the incomplete oxidation to one major source stream and use of a value of 1 for the oxidation factor of the other source streams.*

*Where biomass or mixed fuels are used, the operator shall provide evidence that application of points (a) or (b) of the first subparagraph does not lead to an under-estimation of emissions.”*

The last sub-paragraph makes clear that in any case the emissions reported must be conservative, i.e. not under-estimated. This means that – in the absence of a better methodology – the biomass fraction of the non-emitted carbon must be at least as high as the weighted average biomass fraction of the fuels used.

Note that if not all the biomass used as fuel complies with the RED II, “conservative” in this context means that the above-mentioned “weighted average biomass fraction” takes into account non RED II compliant fuels like fossil fuels.

## 9.7 How to decide if a material is solid or liquid?

When looking into the decision tree for RED II criteria (see section 3.4.2), it does make a difference whether a biomass material is liquid or solid. There are, however, cases where it is not clear if a substance is solid or liquid, unless further guidance is given:

- The Commission advocated a broad definition of bioliquids under RED I, and therefore suggested including in particular viscous liquids such as waste cooking oil, animal fats, palm oil, crude tall oil and tall oil pitch<sup>115</sup> as being liquid. It seems consistent to continue this approach under the RED II.
- In general, the state of a source stream when being used in a process should be considered, not the state in storage. E.g. if an oil is highly viscous or considered solid at the storage tank, but heated for becoming liquid before being combusted, it should be considered liquid for the purpose of applying the RED II criteria.
- Black liquor from the pulp and paper industry is generally considered solid biomass. This is confirmed e.g. in Commission Delegated Regulation (EU) 2015/2402 on harmonised efficiency reference values for CHP.
- Sewage sludge encompasses a wide range of states, from being clearly a liquid of only ca. 5% solids content, over de-watered stages (viscous liquid, ca. 50% solid content, to (almost) completely dry and solid stages (solid content 90% or more). Hence, it will need a case-by-case decision by the competent authority if the sewage sludge in question should be considered solid or liquid. As in the original state it is usually liquid, there will be more cases where it should be considered liquid, even if thereafter it is processed to become increasingly solid.

## 9.8 Examples for biomass not satisfying RED II criteria

The following fuels or materials are examples for biomass which does not satisfy the applicable RED II criteria, i.e. their emissions must be treated as if they were fossil fuels:

- Biofuels produced from agricultural biomass obtained from land that was converted from primary forest to agricultural land after January 2008;
- Wood harvested from an area designated by competent authorities for nature protection purposes (e.g. Natura 2000 areas);
- Several biofuels listed in Annex V part A of the RED II, where typical values for GHG savings are listed to be lower than the required thresholds (see section 3.4.6.2). Exceptions are possible where the economic operator can demonstrate that actual life-cycle emissions of the biofuel are lower than the typical value in the Annex, e.g. because there was less fertilization, more efficient production of the biofuel or shorter transport than typical.

Examples where the RED II typical values suggest that the requirements are usually not met:

- Installations that started biofuel production between 2016 and 2020 (60% savings required): corn (maize) ethanol (natural gas as process fuel in conventional boiler); rape seed, sunflower or soybean biodiesel, etc.
- Installations that started biofuel production from 2021 onwards (65% savings required): pure vegetable oil from soybean; pure vegetable oil from palm oil, etc.

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<sup>115</sup> See Commission Communication 2010/C160/02.