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This is a public document, for any comments regarding the content of this document or the RTRS Standard please contact the:

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The RTRS official languages are English, Spanish and Portuguese, however in case of any inconsistency between different versions of the same document, please refer to the English version as the official one.

RTRS EU RED Compliance Requirements for the Supply Chain

Introduction

The RTRS EU RED Compliance Requirements for the Supply Chain has been developed on request of the RTRS Executive Board. It is part of the RTRS EU RED Scheme, which will allow soy producers and processors to meet the requirements for supplying soy-based biomass, biofuels and/or bioliquids to European Union member states. The *European Union Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources (recast)* (also known as the 'EU RED-II') sets out the land use and GHG savings requirements for eligible biomass, biofuels and bioliquids.

For biofuels and bioliquids produced in installations in operation on or before 5 October 2015, the greenhouse gas emission saving shall be at least 50% compared to the fossil fuel reference. For biofuel and bioliquids produced in installations starting operation from 6 October 2015 until 31 December 2020, the greenhouse gas emission saving shall be at least 60% compared to the fossil fuel reference. For biofuels and bioliquids produced in installations starting operation 1 January 2021, the greenhouse gas emission saving from the use of biofuels and bioliquids shall be at least 65% compared to the fossil fuel reference.

The EU has provided 'disaggregated default' values for most biofuel feedstocks which economic operators can use to calculate whether the fuel they are supplying meets the minimum savings threshold. However, for soy disaggregated default values do not meet the minimum GHG savings. In practice, this means that some supply chain operators will have to record actual values and calculations to show the minimum GHG savings is met.

Scope

This document sets out the requirements against which an economic operator in the soy supply chain will be assessed to demonstrate compliance with the Renewable Energy Directive (EU RED II). The soy supply chain includes the following operators: producers (growers), crush, refining, esterification and blending, and takes into account storage and transportation up until the point the product is delivered to the market. The RTRS EU RED Compliance Requirements for Producers applies to producers (growers) and the RTRS EU RED Compliance Requirements for the Supply Chain applies to all supply chain operators. The RTRS EU RED Compliance Requirements for the Supply are mandatory for all supply chain operators seeking to supply soy, as well as soy-based biomass, biofuels, and/or bioliquids to the EU biofuel market and wanting to communicate RTRS EU RED data, including claiming compliance with RTRS EU RED. Claims can only be made about compliance with the RTRS EU RED requirements if the operator has been successfully assessed against the RTRS EU RED requirements. The unit of certification is the organization's site.

It is anticipated that the RTRS will either develop a GHG calculator, or will assess and approve an existing GHG calculator for use with these RTRS EU RED Compliance Requirements for Producers. Any approval of a calculator will be undertaken using the methodology set out in Section VII of this document and be subject to independent verification prior to approval.

Date of implementation:

This standard becomes effective on

Date of revision:

This standard will be reviewed within five years from the date of implementation at the latest.

Changes from previous version of this document

Version 3.9

RTRS EU RED Compliance Procedure for the Supply Chain V3.12_ENG



Various updates in conformity with Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast) (RED II) and the Updated assessment protocol for voluntary schemes under RED II (July 2020 and June 2022).

Version 3.10

Various updates in conformity with the 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.

Version 3.11

Various updates in conformity with the 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.

Version 3.12

Various updates in conformity with the 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.

How to use this document

The RTRS EU RED Compliance Requirements for the Supply Chain includes the following sections:

- V Definitions
- VI Compliance Requirements for the Supply Chain
- VII Guidance for principles and criteria
- VIII Methodology for Calculating Greenhouse Gas Emissions for the soy supply chain under the European Commission – Renewable Energy Directive (EU-RED)

Supply chain operators and auditors using this document to assess compliance must also refer to the RTRS EU RED Scheme: System Description.

Definitions

Agricultural, aquaculture, fisheries and forestry residues	Residues that are directly generated by agriculture, aquaculture, fisheries and forestry and that do not include residues from related industries or processing.
Biofuel	liquid fuel for transport produced from biomass.
Bioliquid	Liquid fuel for energy purposes other than for transport, including electricity and heating and cooling, produced from biomass.
Biomass	Biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste.
Bulk	Where the soy product and non-soy product occupy the same physical space at the same time

Country of origin	The country where the soybeans were grown
Criteria	The 'content' level of a standard. Conditions that need to be met in order to achieve a Principle.
Economic operator	Organisation which is responsible for one or several steps in the chain of custody
Installation	Any processing installation used in the production process. It does not include production facilities that have been intentionally added to the production chain to qualify for the exemption set out in Directive 2018/2001 article 29. 2. An installation shall be considered to be in operation once the physical production of fuel, heat or cooling, or electricity has started (i.e. once the production of fuels including biofuels, biogas or bioliquids).
Legal ownership	An enforceable claim or title to an asset or property, and is recognized as such by law. This includes the right to possession, the privilege of use, and the power to convey those rights and privileges.
Ligno-cellulosic material	Material composed of lignin, cellulose and hemicellulose, such as biomass sourced from forests, woody energy crops and forest-based industries' residues and wastes
Non-food material	cellulosic Feedstock mainly composed of cellulose and hemicellulose, and having a lower lignin content than ligno-cellulosic material, including food and feed crop residues, such as straw, stover, husks and shells; grassy energy crops with a low starch content, such as ryegrass, switchgrass, miscanthus, giant cane; cover crops before and after main crops; ley crops; industrial residues, including from food and feed crops after vegetal oils, sugars, starches and protein have been extracted; and material from biowaste. Ley and cover crops are understood to be temporary, short-term sown pastures comprising grass-legume mixture with a low starch content to obtain fodder for livestock and improve soil fertility for obtaining higher yields of arable main crops
Organization	The entity which is implementing the EU RED Requirements for the Supply Chain and an RTRS Chain of Custody System.
Operation	An installation shall be considered to be in operation once the physical production of fuel, heat or cooling, or electricity has started (i.e. once the production of fuels including biofuels, biogas or bioliquids, or production of heat, cooling or electricity from biomass fuels has started).
Residue	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. Note: the term "processing residue" is no longer used in RED II; however, a distinction remains regarding agricultural, aquaculture, fisheries and forestry residues, which are "residues that are directly generated by agriculture, aquaculture, fisheries and forestry and that do not include residues from related industries or processing."

RTRS Material accounting system A requirement of the RTRS Chain of Custody Standard which requires operators to control input and output data about the RTRS material. For example, this could be a database.

Waste Any substance or object which the holder discards or intends or is required to discard. Raw materials that have been intentionally modified, or contaminated, to count as waste (e.g. by adding waste material to a material that was not waste) are not covered by this definition.

See also: Article 3(1) of Directive 2008/98/EC of the European Parliament and of the Council.

Compliance Requirements for the Supply Chain

1. Date of Operation

1.1. The organization shall clearly indicate the date of the beginning of operations in the installation, in which the production of soy-derived biofuels or bioliquids is taking place.

2. Calculation of GHG emissions for the supply chain

2.1. General requirements

2.1.1. The greenhouse gas emission savings from the use of soy-derived biofuels or bioliquids shall be calculated as follows:

2.1.1.1. By using the default value for soybean biodiesel, hydrotreated vegetable oil from soybean or pure vegetable oil from soybean laid down in the Renewable Energy Directive (EU RED II) recast Part A or B of Annex V for biofuels, whenever the e_l value (annualised emissions from carbon stock changes caused by land-use change;) calculated in accordance with point 7 of Part C of Annex V is equal to or less than zero;

2.1.1.2. By using an actual value calculated in accordance with the methodology laid down in Part C of Annex V for biofuels and bioliquids;

2.1.1.3. By using a value calculated as the sum of the factors of the formulas referred to in point 1 of Part C of Annex V, where disaggregated default values in Part D or E of Annex V may be used for some factors, and actual values, calculated in accordance with the methodology laid down in Part C of Annex V, are used for all other factors;

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

(a) Information on actual GHG emissions for all relevant elements of the GHG emission calculation formula. 'Relevant' refers in this context to elements for which reporting is obligatory (e.g. e_l in case of land use change), all elements for which actual values should be used instead of disaggregated default values and all elements related to emission savings (if applicable).

(b) Actual values of emissions from cultivation can only be determined at the origin of the chain of custody.

- (c) GHG emissions shall be reported in g CO₂eq/dry ton of soy.
- (d) Actual values of emissions from transport can only be determined if emissions of all transport steps are recorded and transmitted through the chain of custody.
- (e) Actual values of emissions from processing can only be determined if emissions of all processing steps are recorded and transmitted through the chain of custody.
- (f) For the purpose of actual GHG emission calculations, whenever available, the standard calculation values published in Annex IX of the Implementing Regulation shall be applied.

2.2. Greenhouse gas (GHG) emissions from soy processing shall be measured and recorded. The organization may use either a disaggregated default value (Option 1) or an actual value (Option 2).

Option 1 – Disaggregated default value

2.2.1. The organization may use a disaggregated default value for soy processing. In such case, no GHG value shall be reported in the product documentation. However, use of the disaggregated default value will prevent the use of actual values for processing in the supply chain and may preclude the end product from meeting the minimum GHG savings as required in the EU RED-II (see guidance).

2.2.2. Default values listed in RED recast Annexes V and VI can only be applied if the process and technology used for soy processing match their description and scope (FAME or HVO). In case specific technologies are set out, the default values can only be used if those technologies were actually applied.

Option 2 – Actual value

These requirements are applicable only if an organization is processing material.

- 2.2.3. Product yield data (including subsidiary products) shall be measured, monitored and recorded
- 2.2.4. Electricity consumption shall be measured, monitored and recorded.
- 2.2.5. Where the processing facility co-generates electricity (CHP), surplus electricity shall be measured, monitored and recorded.
- 2.2.6. Where the processing facility co-generates electricity (CHP), fuel type shall be recorded.
- 2.2.7. Where the processing facility co-generates electricity (CHP), type of CHP plant shall be recorded.
- 2.2.8. Heat generation for processing shall be measured, monitored and recorded.
- 2.2.9. Fuel used in processing shall be measured, monitored and recorded
- 2.2.10. Operating materials used in processing shall be measured, monitored and recorded.
- 2.2.11. Effluent quantities from processing shall be measured, monitored and recorded.
- 2.2.12. GHG emissions for the soy processing facility shall be calculated and expressed in g CO₂eq/dry ton of soy or intermediary products.

2.2.13. EC standard values for emission factors, as provided in the Implementing Regulation (Annex IX)¹ shall be used for the calculation of actual GHG emissions.

Note: These calculations can be made using an RTRS approved on-line GHG emissions calculator.

2.2.14. The organization shall make available to auditors all relevant information concerning the calculation of actual GHG emissions in advance of the planned audit. Documentation and records are kept for at least five (5) years, or longer if required by the relevant national authority.

2.3. Greenhouse gas (GHG) emissions from transport of soy products shall be measured and recorded.

This requirement is applicable to the organization that has control of the transport of soy products between the two economic operators (e.g. between production area and grain silo or crush, between crush and refinery, between refinery and manufacturer, etc).

Option 1 – Disaggregated default value

2.3.1. The organization may use a disaggregated default value for transportation. In such case, no GHG value shall be reported in the product documentation. However, use of the disaggregated default value will prevent the use of actual values for transportation in the supply chain and may preclude the end product from meeting the minimum GHG savings as required in the EU RED-II (see guidance).

2.3.2. Default values listed in RED recast Annexes V and VI can only be applied if the process and technology used for transport match their description and scope. In case specific technologies are set out, the default values can only be used if those technologies were actually applied.

Option 2 – Actual value

2.3.3. Where transportation to the next economic operator is under the control of the organization, the following shall be measured and recorded:

- a) The distance between the organization's site and the next economic operator,
- b) The type of transport used to transport the soy product,
- c) The quantity of soy product transported.
- d) For soy beans, the moisture content of the transported crop.

2.3.4. GHG emissions for transportation shall be calculated and expressed in g CO₂eq/dry ton of soy or intermediary product.

Note: These calculations can be made using an RTRS approved on-line GHG-emissions calculator.

2.3.5. The organization shall make available to auditors all relevant information concerning the calculation of actual GHG emissions in advance of the planned audit. Documentation and records are kept for a minimum of 5 years, or longer where it is required by the relevant national authority, as per Article 10(5c) of the Implementing Regulation .

¹ [Commission Implementing Regulation](#) on rules to verify sustainability and greenhouse gas emissions saving criteria and low indirect land-use change-risk criteria, European Commission, 2022

2.4. Supply chain greenhouse gas (GHG) emissions shall be calculated

2.4.1. Where the organization produces co-products, actual values for GHG emissions for the supply chain (up to and including the organization) shall be allocated to the soy products in proportion to the energy content of the co-products, including:

- a) actual processing values
- b) actual transportation values
- c) actual cultivation and land use change values

2.4.2. The organization shall calculate the total GHG emissions for processing up to and including their own processing facility, for each input recorded in the material accounting system for RTRS data. GHG emissions shall be expressed in g CO₂eq/ dry ton of soy or intermediary product.

Note: These calculations can be made using an RTRS approved on-line GHG-emissions calculator.

2.4.3. The organization shall calculate the total GHG emissions from transport up to and including transport (in g CO₂eq/ dry ton of soy or intermediary product) within their own control, for each input recorded in the material accounting system for RTRS data. At each step of the chain of custody it shall be verified whether the emission estimate needs to be adjusted:

2.4.3.1. At each step of the chain of custody it shall be verified whether the emission estimate needs to be adjusted:

- a) Additional emissions from transport and/or processing have to be added to e_p and or e_{td} respectively.
- b) Energy losses occurred during processing or if relevant transportation or storage have to be taken into account using a 'feedstock factor'.
- c) Whenever a processing step yields co-products, emissions need to be allocated using an 'allocation factor' following the rules set out in the GHG emission calculation methodology.
- d) At the last processing step the emission estimate needs to be converted into the unit gCO₂eq/MJ final fuel (See details in Annex VIII).

Note: These calculations can be made using an RTRS approved on-line GHG-emissions calculator.

2.4.4. The organization shall make available to auditors all relevant information concerning the calculation of actual GHG emissions in advance of the planned audit. Documentation and records are kept for at least five (5) years, or longer if required by the relevant national authority.

2.5. Total greenhouse gas (GHG) emissions shall be calculated

2.5.1. Economic operators may calculate the total greenhouse gas emissions of soybean vegetable oil, soybean biodiesel (FAME) or hydrotreated vegetable oil (HVO) through any of the three following options:

- a) As the sum of disaggregated default values for each term of the formula included in Section D of Annex V of Directive (EU) 2018/2001.
- b) As the sum of actual values for each term of the formula included in Section C of Annex V of the Renewable Energy Directive (EU RED II) recast¹; or
- c) As the sum of combined disaggregated default values (Sections D and E of Annex V) and actual values.

2.5.2. Disaggregated default values listed in Annex V can only be applied if the process technology and feedstock used for the production of vegetable oil, soybean biodiesel (FAME) or hydrotreated

vegetable oil (HVO) match their description and scope. In case specific technologies are set out the disaggregated default values can only be used if those technologies were actually applied.

2.5.3. When disaggregated default values are used, information on GHG emissions shall only be reported for final biofuels and can be reported as an aggregate. If relevant, both, the process technology and the raw material used need to be specified.

2.5.4. When using actual values, the producer of vegetable oil, soybean biodiesel (FAME) or hydrotreated vegetable oil (HVO) shall also add the following emissions:

- a) emissions at the filling station
- b) emissions at fuel storage depot(s) and transport to and from the depot(s)

2.5.5. For biofuels produced in installations, the emissions savings threshold depends on the data of start of production.

The greenhouse gas emission savings from the use of soybean vegetable oil, soybean biodiesel and hydrotreated vegetable oil shall be:

- (a) at least 50% for installations in operation on or before 5 October 2015;
- (b) at least 60% for installations starting operation from 6 October 2015 until 31 December 2020;
- (c) at least 65% for installations starting operation from 1 January 2021;

The fossil fuel reference for soybean vegetable oil, soybean biodiesel and hydrotreated vegetable oil is 94 g CO₂eq/MJ.

Note: These calculations can be made using an RTRS approved on-line GHG-emissions calculator.

2.5.6. The organization shall make available to auditors all relevant information concerning the calculation of actual GHG emissions in advance of the planned audit. Documentation and records shall be kept for at least five (5) years, or longer if required by the relevant national authority.

3. Communication of information

3.1. The organization shall identify consignments of RTRS material as EU RED II compliant only when they meet the land use requirements, as determined by information provided by economic operators supplying inputs into the organization's material accounting system for RTRS data, and

- a) Have been processed by an installation that was in operation on 5 October 2015
- Or
- b) When the total GHG emissions savings meet the minimum Renewable Energy Directive (EU RED II) threshold.

3.2. Whenever actual GHG emissions values are used, the organization shall communicate GHG emissions data about each RTRS consignment to the next economic operator in the supply chain, including:

- a) Total GHG emissions for cultivation (e_{ec} in g CO₂eq/dry ton of soy) and land use (e_l in g CO₂eq/dry ton of soy);

In order to establish whether the minimum GHG emissions savings have been achieved, GHG emissions from biofuel production are compared to the relevant fossil fuel comparator. GHG emissions are measured in this context in the unit CO₂eq/MJ of biofuel. Hence, for final biofuels GHG emissions have always to be reported in this unit. The situation is different for raw materials and interim products though. In case actual values are



calculated for raw materials and interim products, farmers for example, cannot report cultivation GHG emissions in the unit CO₂eq/MJ of biofuel because this would require knowing how efficiently these are converted into final biofuels. Instead, for raw materials and interim products, information on GHG emissions has to be provided in the unit g CO₂eq/dry-ton feedstock or g CO₂eq/dry-ton intermediary product, respectively.

To receive information on emissions per dry-ton feedstock the following formula has to be applied:

$$e_{ec} \text{ feedstock}_a [gCO_2eq / kgdry] = (e_{ec} \text{ feedstock}_a [gCO_2eq / kg_{moist}]) / (1 - \text{moisture content})$$

The moisture content should be the value measured after delivery, or, if this is not known, the maximum value allowed by the delivery contract.

- b) Total GHG emissions for transportation up to and including transport within their own control (e_{td} in g CO₂eq/dry ton of soy /intermediary product);
- c) Total GHG emissions for processing up to and including the processing facility (e_p in g CO₂eq/dry ton of soy /intermediary product);
- d) Information on actual GHG emissions (in g CO₂eq/dry ton of soy /intermediary product) for all other relevant elements of the GHG emission calculation formula.

All of the above elements of calculation (e_{ec} , e_i , e_{td} , e_p , etc.) shall be reported separately. If at any point of the chain of custody emissions have occurred and are not recorded, so that the calculation of an actual value is no longer feasible for operators downstream in the chain of custody, this must be clearly indicated in the delivery notes.

Whenever default values are used, no information on GHG emissions needs to be communicated to the next economic operator.

3.3. The organization shall communicate the following information about consignments to the next economic operator:

- a) Country of origin;
- b) Whether processing of soy products involved installations which started operations on or before 5 October 2015, from 6 October 2015 until 31 December 2020 or from 1 January 2021.
- c) The status of the land in January 2008 of the soy products supplied.

3.4. Where the soy products are supplied in bulk with non-soy products, the soy component (proportion or quantity) is communicated to the next economic operator in the supply chain.

3.5. The organization shall only communicate information about RTRS soy on GHG data, calculations, origin, date of installations and land use status where the information has been received from economic operators who have:

- a) A valid RTRS Chain of Custody certificate that includes the RTRS EU RED Compliance Requirements for the Supply Chain in its scope when the organization buys from soy traders or processors,, or
- b) A valid RTRS certificate, production and chain of custody for producers, that includes the RTRS EU RED Compliance Requirements for Producers within its scope when the organization buys directly from soy producers

3.6. The organization shall operate a mass balance system in line with the RTRS EU RED Chain of Custody Standard, which:

- 3.6.1.1. Allows consignments of soy or soy-derived products with differing sustainability and greenhouse gas emissions saving characteristics to be mixed for instance in a



- container, processing or logistical facility, transmission and distribution infrastructure or site;
- 3.6.1.2. Allows consignments of soy or soy-derived products with differing energy content to be mixed for the purposes of further processing, provided that the size of consignments is adjusted according to their energy content;
 - 3.6.1.3. Requires information about the sustainability characteristics and sizes of the consignments referred to in point (a) to remain assigned to the mixture;
 - 3.6.1.4. Provides for the sum of all consignments withdrawn from the mixture to be described as having the same sustainability characteristics, in the same quantities, as the sum of all consignments added to the mixture and requires that this balance be achieved over an appropriate period of time;
 - 3.6.1.5. Operates at a level where consignments could normally be in contact, such as in a container, processing or logistical facility or site (defined in RTRS EU RED Compliance Procedure for Producers).;
 - 3.6.1.6. If more than one legal entity operates on a site then each legal entity is required to operate its own mass balance.
- 3.7.** If a consignment of raw material or fuel has already been taken into account in the calculation of the share of renewable energy in any Member State, no further sustainability claims is issued for the same consignment in another Member State.
- 3.8.** Where a consignment is processed, information on the sustainability and greenhouse gas emissions saving characteristics of the consignment shall be in line with the requirements detailed in Module A.1.3 of the RTRS EU RED Chain of Custody Standard.
- 3.9.** The organization shall operate a documented management system, including an auditable system for the evidence related to compliance with the Renewable Energy Directive and Implementing Regulation, and to the claims they make or rely on. Documentation and records shall be kept for at least five (5) years, or longer where it is required by the relevant national authority.
- 3.10.** The organization shall prepare any information related to the auditing of evidence described in 3.7.
- 3.11.** Transparency on other voluntary scheme participation by certification applicants.
- 3.11.1.1. Certification applicants shall declare to auditors the names of all schemes they currently participate in or previously participated in.
 - 3.11.1.2. Certification applicants shall make available all relevant information, including the mass balance data and the auditing reports.
 - 3.11.1.3. The organization shall declare whether they had a different legal form or name in the past 12 months prior to application for certification.
- 3.12.** Auditors need to verify that the entries in the Union Database² of the certified economic operator correspond with the figures that are part of the economic operator's book keeping and net mass balance data or other encoded information on their entities or sites. Any deviations between data that has been registered in the Union Database and the respective data from the economic operator's documentation shall be immediately flagged in the audit report and to the voluntary scheme. Such discrepancies can lead to major non-conformities identified in the audit report and trigger a suspension of the certificate of the economic operator.

² [UNION Database Home](#)



- 3.13.** The organisation shall accept responsibility for preparing any information related to the auditing of evidence related to compliance with the Renewable Energy Directive and Implementing Regulation³, as well as making available to the European Commission and the competent authorities of the Member States all information needed to fulfil their tasks under Directive (EU) 2018/2001 in line with Article 17 of the Implementing Regulation; **Error! Marcador no definido..**

Note: This requirement applies to all voluntary schemes that the organization is participating in.

³ <https://op.europa.eu/en/publication-detail/-/publication/8793eb1c-ebc7-11ec-a534-01aa75ed71a1/language-en/format-PDF>

Guidance for Compliance Requirements

The guidance contained in this annex must be followed by:

- I. auditors, evaluating compliance against the RTRS EU RED Compliance Requirements for the Supply Chain
- II. organizations seeking to comply with the RTRS EU RED Compliance Requirements for the Supply Chain

Indicators	Guidance
2.1.1	<p>If the disaggregated default value is used for a consignment, it will prevent the use of actual values for processing in the entire supply chain of that consignment. This is because the disaggregated default value provided by the EU for processing includes the sum of all processing in the supply chain. It is therefore not possible to add actual values to the disaggregated default value later in the supply chain.</p> <p>A disaggregated default value for processing can only be used if actual values are used for cultivation and land use change, otherwise the minimum GHG savings will not be met. The greenhouse gas emission savings from the use of biofuels, bioliquids shall be:</p> <ol style="list-style-type: none"> (a) at least 50% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations in operation on or before 5 October 2015; (b) at least 60% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations starting operation from 6 October 2015 until 31 December 2020; (c) at least 65% for biofuels, biogas consumed in the transport sector, and bioliquids produced in installations starting operation from 1 January 2021; (d) at least 70% for electricity, heating and cooling production from used in installations starting operation from 1 January 2021 until 31 December 2025, and 80% for installations starting operation from 1 January 2026.
2.2.1	<p>The disaggregated default values for processing of soy are:</p> <ul style="list-style-type: none"> • 5.9 gCO₂eq/MJ for pure vegetable oil • 13.4 gCO₂eq/MJ for biodiesel (FAME). • 13.7 gCO₂eq/MJ for hydrotreated vegetable oil (HVO). <p>It must be made clear to the next economic operator that the disaggregated default value has been used for a consignment.</p>
2.2.3	<p>Yield main product [kg main product/a] is annual yield of main product e.g. kg soy oil/a and yield subsidiary product [kg subsidiary product/a]</p>
2.2.4	<p>Electricity consumption [kWh/a] is total annual consumption of electricity bought in, i.e. not produced in own CHP plant.</p>
2.2.5	<p>Surplus electricity [kWh/a] is electricity fed annually into an external network, which is manufactured in the business's own CHP plant in addition to its own consumption,</p>

Indicators	Guidance
2.2.6	Fuel type of the CHP plant is the type of fuel used in the CHP plant, e.g. fuel oil, gas, coal.
2.2.7	Type of CHP plant (e.g. block heat and power plant (BHPP), steam turbine plant (STP), gas turbine plant (G T/combined power plant).
2.2.8	Heat production – fuel type is type of fuel used to generate steam e.g. fuel oil, gas, crop residues
2.2.9	Fuel consumption [kg/a] is total annual consumption of fuel for heat generation, e.g. fuel oil [kg], gas [kg]
2.2.10	Operating materials [kg/a] is total annual consumption for processing. Standard emission factors found in Annex IX of the Implementing Regulation shall be used.
2.2.11	Effluent [l/a] is total annual production from processing.
2.2.12	See also 2.3.1 regarding allocation and Section VIII. The units used shall be gCO ₂ eq/dry ton intermediate product. Note that allocation is addressed below in 2.3.1.
2.3.1	<p>If the disaggregated default value for transport and distribution is used for a consignment, it will prevent the use of actual values for transportation in the entire supply chain of that consignment. This is because the disaggregated default value provided by the EU for transportation includes the sum of all transportation in the supply chain. It is therefore not possible to add actual values to the disaggregated default value later in the supply chain. However, because the EU disaggregated default value for transportation is the same as the typical value, there is a lower risk as compared to processing that using the disaggregated default value will cause the GHG emissions to fall below the 50%/60%/65% savings. -</p> <p>The disaggregated default values for transportation and distribution of soy and soy-derived biofuels and bioliquids are:</p> <ul style="list-style-type: none"> • 8.8 gCO₂eq/MJ for pure vegetable oil • 8.9 gCO₂eq/MJ for biodiesel (FAME). • 9.2 gCO₂eq/MJ for hydrotreated vegetable oil (HVO). <p>It must be made clear to the next economic operator that the disaggregated default value has been used for a consignment.</p>
2.3.2	<p>This includes cases where the organization seeking or holding certification outsources activities to independent third parties (e.g. subcontracts for storage, transport or other outsourced activities).</p> <p>a) The transport distance [in km] is the distance, over which the biomass was transported to the next business or the next business site e.g. distance between the grower and the oil mill, including the (empty) return run</p> <p>b) e.g. 40t diesel HGV</p> <p>c) The quantity of biomass transported in the particular type of transport (e.g. 40T)</p> <p>d) For soy beans, the mass of the dry crop shall be used for the calculation.</p>



Indicators	Guidance
2.2 and 2.3	<p>These options are available for GHG calculations:</p> <ul style="list-style-type: none"> • Using disaggregated default values (see 2.2.1 guidance) • Using an RTRS approved RED GHG calculator. This is a software tool where input data is entered and the computer calculates the GHG emissions. • Using actual calculations for transport, as set out in Annex VII. The units used shall be gCO₂eq/dry ton intermediate product.
2.4.1	<p>Energy allocation is as per the lower calorific value of the co-products. See Section VIII.</p> <p>The units shall be gCO₂eq/dry ton intermediate product.</p> <p>Where disaggregated default values are used, no allocation shall be applied to those values. Allocation shall be applied to actual cultivation and land use change values at each processing step even if a disaggregated default value for processing is used.</p> <p>GHG emissions from processing should not be added to GHG emissions from cultivation & land use change, or transportation. This is because an economic operator further downstream will not be able to use a disaggregated default transport or processing value if an aggregate calculation is undertaken upstream.</p>
2.4.2	<p>GHG emissions from processing should not be added to GHG emissions from cultivation & land use change, or transportation for this requirement. This is because an economic operator further downstream will not be able to use a disaggregated default transport or processing value if an aggregate calculation is undertaken upstream.</p> <p>These options are available for GHG calculations:</p> <ul style="list-style-type: none"> • Using the disaggregated default value of 26 gCO₂eq/MJ fuel (see 2.1.1 guidance) • Using an RTRS approved RED GHG calculator. This is a software tool where input data is entered and the computer calculates the GHG emissions. • Using manual calculations for transport, as set out in Section VIII.
2.4.3	<p>GHG emissions from transport should not be added to GHG emissions from cultivation & land use change, or processing for this requirement. This is because an economic operator further downstream will not be able to use a disaggregated default transport or processing value if an aggregate calculation is undertaken upstream.</p> <p>These options are available for GHG calculations:</p> <ul style="list-style-type: none"> • Using the disaggregated default value for vegetable oil, biodiesel or hydrotreated vegetable oil (see 2.2.1 guidance) • Using an RTRS approved RED GHG calculator. This is a software tool where input data is entered and the computer calculates the GHG emissions. • Using manual calculations for transport, as set out in Section VIII.
2.5.1	<p>Disaggregated default values and actual values can be added together at this step. The units shall be gCO₂eq/MJ final fuel. See Section VIII.2 for details.</p>



Indicators	Guidance
	<p>When actual values are used, the last economic operator shall add emissions relating to the depot and filling station to the total greenhouse gas emissions figure. If actual values are used the calculations shall follow the instructions given in Section VIII 2.1. of this document (for transport emissions) and Section VIII 2.2. of this document (only using the variable “electricity consumption” for emissions at depot and filling station).</p> <p>Actual values can only be calculated when all relevant information is available and transmitted through the chain of custody:</p> <ul style="list-style-type: none"> a) Actual values of emissions from cultivation can only be determined at the origin of the chain of custody. b) Actual values of emissions from transport can only be determined if emissions of all transport steps are recorded and transmitted through the chain of custody. c) Actual values of emissions from processing can only be determined if emissions of all processing steps are recorded and transmitted through the chain of custody.
3.1	<p>This information shall be managed in the organization’s material accounting system as per the requirements of the mass balance chain of custody system.</p> <p>Identification will include for example indicating on invoices and transportation documents, as set out in the requirements RTRS Chain of Custody Standard and the RTRS EU RED Communication and Claims Policy.</p> <ul style="list-style-type: none"> a) In practice, organizations should bear in mind the likely final delivery date to the end market when communicating the Renewable Energy Directive (EU RED II) compliance. b) This calculation will only be undertaken by organizations producing soybean vegetable oil, soybean biodiesel (FAME) or hydrotreated vegetable oil (HVO). The GHG savings shall be calculated using the value from 2.4 and the fossil comparator of 94 g gCO₂eq/MJ (the latest available actual average emissions as reported under Directive 2018/2001 shall supersede this value where they differ) <p>The following formula shall be used: $SAVING = (E_F - E_B) / E_F$</p> <p>where E_F is the fossil comparator and E_B is the total GHG emission value calculated as per 2.4.</p> <p>If an organisation takes legal ownership of the soybean vegetable oil, soybean biodiesel (FAME) or hydrotreated vegetable oil (HVO) further downstream of the soybean vegetable oil, soybean biodiesel (FAME) or hydrotreated vegetable oil (HVO) processing organisation, that organisation shall add its emissions (see 2.4.2.) and calculate the GHG reduction potential.</p>
3.2	<p>This information shall be managed in the organization’s material accounting system as per the requirements of the mass balance chain of custody system.</p> <p>The values should be provided separately (not as a single value).</p> <ul style="list-style-type: none"> a) only applies to producers of soybean vegetable oil, soybean biodiesel (FAME) or soybean hydrotreated vegetable oil (HVO). The unit should be gCO₂eq/MJ final fuel and % savings compared to the fossil equivalent. Where the GHG savings has been calculated and the minimum threshold is not met, no information set out in 3.1.2 shall be communicated about the consignment.

Indicators	Guidance
	<p>b) The production value unit should be in gCO₂eq/dry ton intermediate product (see 2.3.1 on allocation).</p> <p>c) The transportation value unit should be in gCO₂eq/dry ton intermediate product (where the actual value is used).</p> <p>d) The processing value unit should be in gCO₂eq/dry ton intermediate product.</p> <p>e) Information on actual GHG emissions shall be provided for all relevant elements of the GHG emission calculation formula. Relevant refers in this context to elements for which reporting is obligatory (e.g. in case of land use change), all elements for which actual values should be used instead of disaggregated default values and all elements related to emission savings (if applicable).</p> <p>Where the organization communicates information about non-RTRS soy, it must be clear that the information is not covered by the organization's RTRS EU RED Requirements for the Supply Chain certification (which is part of their RTRS Chain of Custody certificate).</p>
3.3	<p>This information shall be managed in the organization's material account system as per the requirements of the mass balance chain of custody system.</p> <p>Where the GHG savings has been calculated (see 2.4 and 3.1.1 guidance) and the minimum threshold is not met, no information set out in 3.1.3 shall be communicated about the consignment.</p> <p>a) See glossary definition for country of origin.</p> <p>b) It is not necessary to communicate the specific date the installation began operation, provided it was before 5 October 2015. This communication can be based on a mass balance allocation, as set out in the RTRS Supply Chain Certification Protocol.</p> <p>c) The status of the land includes:</p> <ul style="list-style-type: none"> • Cropland; • Perennial crops; • Non-highly biodiverse or high carbon areas (where land use change has occurred but there is evidence that 2.2.1 and 2.3.1 of 'RTRS EU RED Compliance Requirements for producers' have been met) • Areas designated for nature protection purposes, where cultivation did not interfere with these purposes should be reported as 'protected'. • Areas designated for the protection of rare, threatened or endangered ecosystems or species recognised by the European Commission, where cultivation did not interfere with these purposes should be reported as 'protected'. • Areas not designated for nature protection purposes should be reported as 'non-protected'.
3.4	See glossary definition for bulk.
3.5	This will be implemented as part of the organization's supply chain management system. See the RTRS Chain of Custody Standard.



Indicators	Guidance
3.6	The RTRS Chain of Custody certificate must include the mass balance and/or the segregated module within the scope of the certification, See the RTRS Chain of Custody Standard, modules A, B and E.
3.7	<p>See also RTRS Chain of Custody Standard.</p> <p>VI. General Chain of Custody System Requirements for Producers</p> <p>2.3 Records</p> <p>2.3.2 The organization shall implement a record keeping system for all records and reports, including purchase and sales documents, training records, production records and volume summaries. The record retention period shall be specified by the organization and shall be a minimum of 5 years, or longer where it is required by the relevant national authority, as per Article 10(5c) of the Implementing Regulation .</p> <p>VII. General Chain of Custody System Requirements for the Supply Chain</p> <p>2.4 Records</p> <p>2.4.2 The organization shall implement a record keeping system for all records and reports, including purchase and sales documents, training records, production records and volume summaries. The record retention period shall be specified by the organization and shall be a minimum of 5 years, or longer where it is required by the relevant national authority, as per Article 10(5c) of the Implementing Regulation.</p>



Methodology for Calculating Greenhouse Gas Emissions for the soy supply chain under the European Commission – Renewable Energy Directive recast (EU-RED II)

The following methodology has been included as reference for the RTRS EU RED Compliance Requirements for Processors.

In practice, GHG calculations will normally be undertaken by a processor.

Computer software based on the following calculations is expected to be widely available. Any formal approval of a specific calculator by the RTRS will use the methodology set out below.

4. Accurately-measured data

‘Measured data’ means data that are used to calculate the actual values. These data can either be ‘measured’ on site or taken from verifiable recognized scientific literature sources or databases, where the data is peer reviewed and consistent with other existing data sources. Whenever available, the data (“standard calculation values”) published in Annex IX of the Implementing Regulation shall be applied.

The following data are regarded as being accurately-measured only if they are collected on site, in other words, the relevant quantities were taken from sources such as business documents:

- Quantity of main product and co-products
- Quantity of chemicals used (e.g. methanol, NaOH, HCl, hexane, citric acid, bleaching clay)
- Fuel consumption, electricity consumption
- Consumption of thermal energy or energy sources consumed for process energy production

Accurately-measured data collected in the field must be documented (field calendar, delivery notes and invoices etc). The following data are considered to be accurately measured if they are taken from a scientifically-recognized literature source (including statistical data from government bodies):

- Calorific values of the main product and co-products,
- Emission factor of chemicals, electricity, thermal energy, for example and

For values taken from literature sources or databases (calorific values, emission factors etc), the source (e.g. name of publication and author) and year of publication must be documented and shall be based on the most recent available data and updated over time. The data should be peer reviewed before publication and consistent with other existing data sources. Where there are appropriate regional emission factors available, those regional emission factors should be used.

Operators also always have the option of collecting data by taking measurements themselves. In this case, the method must be clearly documented and explained so that the calculations can be understood.

Figures for greenhouse gas savings are rounded to the nearest percentage point.

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

- a) Actual values of emissions from cultivation can only be determined at the origin of the chain of custody.
- b) Actual values of emissions from transport can only be determined if emissions of all transport steps are recorded and transmitted through the chain of custody.
- c) Actual values of emissions from processing can only be determined if emissions of all processing steps are recorded and transmitted through the chain of custody.

5. GHG emissions calculation methodology for EU-RED II

According to the formula in Annex V of the EU-RED II the greenhouse gas emissions for soy oil shall be calculated as follows:

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

Where

E = total emissions for final fuel (vegetable oil, biodiesel or hydrotreated vegetable oil)

e_{ec} = emissions from the cultivation of soy

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

The GHG emission savings from soil carbon accumulation via improved agricultural management (e_{sca}), from carbon capture and geological storage (e_{ccs}) and from carbon capture and geological storage (e_{ccr}) are not applicable in the RTRS scheme (See also Section 2.4).

Greenhouse gas emissions from the production and use of bioliquids shall be calculated as for biofuels (E), but with the extension necessary for including the energy conversion to electricity and/or heat and cooling produced, as follows:

(i) For energy installations delivering only heat:

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

(ii) For energy installations delivering only electricity:

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

where

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

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

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

η_{th} = The heat efficiency, defined as the annual useful heat output divided by the annual bioliquid input based on its energy content.

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

$$EC_{el} = \frac{E}{\eta_{el}} \left(\frac{C_{el} \cdot \eta_{el}}{C_{el} \cdot \eta_{el} + C_h \cdot \eta_h} \right)$$

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

$$EC_h = \frac{E}{\eta_h} \left(\frac{C_h \cdot \eta_h}{C_{el} \cdot \eta_{el} + C_h \cdot \eta_h} \right)$$

where:

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

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

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

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η_{th} = The heat efficiency, defined as the annual useful heat output divided by the annual fuel input based on its energy content.

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

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

The Carnot efficiency, C_h , for useful heat at different temperatures is defined as:

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

where

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

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

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

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

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

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

GHG emissions shall be expressed in gCO₂eq/dry ton of soy or intermediary products (e.g. soy oil) up to the final stage of the supply chain. In the final stage of the GHG calculation, all units shall be converted to gCO₂eq/MJ of final fuel. (See details for conversion in Section 3.2). For this transformation, the following formula should be applied to emissions from cultivation:

$$e_{ec fuel_a} \left[\frac{gCO_2eq}{MJ fuel} \right]_{ec} = \frac{e_{ec feedstock_a} \left[\frac{gCO_2eq}{kg dry} \right]}{LHV_a \left[\frac{MJ feedstock}{kg dry feedstock} \right]} * Fuel feedstock factor_a * Allocation factor fuel_a$$

Where

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

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

The following value shall be used:

- LHV: 23.5 MJ/kg dry soybeans

5.1. Calculating the GHG emissions from transport (e_{td})

If the organization has control of the transportation, the following formula is used to calculate the GHG emissions for transport e_{td} of biomass including all transport steps:

$$e_{td}' = \frac{(transport_dis_tan\ ce_{laden}[km] * FC_{laden}[\frac{1}{km}] + transport_dis_tan\ ce_{empty}[km] * FC_{empty}[\frac{1}{km}]) * emission_factor_{fuel}[\frac{kgCO_2}{l}]}{transported_biomass[kg]}$$

The GHG emissions already taken into account for raw material production and cultivation are not included in the calculations.

To calculate e_{td}

- the transport distances [in km] – distance, over which the biomass was transported to the next business or the next business site e.g. distance between the grower and the oil mill, including the (empty) return run.
- the means of transport (e.g. 40t diesel HGV) and
- the quantity of biomass transported in the particular means of transport (e.g. 40t) and for soy beans the moisture content of the transported crop

shall be stated.

For soy beans, the mass of the dry crop shall be used for the calculation.

To calculate e_{td},

- the emission factor fuel,
- FC_{laden}[l/km] – fuel consumption of the particular means of transport per km when laden and
- FC_{empty}[l/km] – fuel consumption of the particular means of transport per km on an empty run (return run)

shall be stated or taken from a scientific literature source which has been peer reviewed before publication and are consistent with other existing data sources.

Emissions from transport shall be expressed in g CO₂eq/dry ton of soy or intermediate product.

Peer reviewed scientific publications shall be used as sources for emission factors, and are consistent with other available emission factor figures. Standard emission factors found in Annex IX of the Implementing Regulation shall be used.

The emissions of depots and filling stations may be calculated using the data provided by the EU Joint Research Center: The provided values (depot: 0.00084 MJ/MJ fuel, filling station: 0.0034 MJ/MJ fuel) must be multiplied by the appropriate national electricity emission factors from EU Implementing Regulation 2022/996.

5.2. Calculating the GHG emissions from processing (e_p)

Each organization in the supply chain processing soy shall ensure that all the GHG emissions from processing e_p, GHG emissions from waste (effluent) and GHG emissions from the manufacture of all resources necessary for the process are included in the calculation of the GHG emissions and uses the following formula:

$$e_p' = \frac{em_{electricity_consumption}[\frac{kgCO_2}{a}] + em_{heat_generation}[\frac{kgCO_2}{a}] + em_{operating_materials}[\frac{kgCO_2}{a}] + Em_{effluen}}{yield_{main_product}[\frac{kg_yield}{a}]}$$

Meaning of the variables (em = emission):

$$em_{elec} = elec \left[\frac{kWh}{a} \right] * emission_factor_{regional_elec_mix} \left[\frac{kgCO_2}{kWh} \right]$$

$$em_{heat_generation} = fuel_consumption \left[\frac{kg}{a} \right] * emission_factor_{fuel} \left[\frac{kgCO_2}{kg} \right]$$

$$em_{op_material} = op_mat_consumption \left[\frac{kg}{a} \right] * emission_factor_{op_mat} \left[\frac{kgCO_2}{kg} \right]$$

$$em_{effluent} = effluent \left[\frac{l}{a} \right] * emission_factor_{effluent} \left[\frac{kgCO_2}{l} \right]$$

To calculate the emissions from processing (e_p) the following data shall be collected on site, based on from business documents. Alternative reference values (month, kg of main product etc) may be used:

- electricity consumption [kWh/a] – total annual consumption of electricity bought in, i.e. not produced in own CHP plant.
- heat production – fuel type– type of fuel used to generate steam e.g. fuel oil, gas, crop residues,
- fuel consumption [kg/a] – total annual consumption of fuel for heat generation, e.g. fuel oil [kg], gas [kg], bagasse [kg],
- op_mat_consumption [kg operating materials/a]
- effluent quantity [l/a] – annual quantity of effluent
- yield_main product [kg main product/a] – annual yield of main product e.g. kg soy oil/a
- yield_subsidary product [kg subsidiary product/a]

The GHG emissions from waste are included in the calculation of e_p .

To calculate e_p the following emission factors can be taken from a scientific literature source which is peer reviewed and consistent with other existing data sources (Standard emission factors found in Annex IX of the Implementing Regulation shall be used):

- emission factor of fuel [kg CO₂/kg]
- emission factors for operating materials [kg CO₂/kg]
- emission factor effluent [kg CO₂/l] and
- emission factor national or regional electricity mix [kg CO₂/kWh]

Emissions from processing shall be expressed in g CO₂eq/dry ton of soy or intermediate product. When calculating the GHG emissions of electricity consumption (where additional electricity is bought in) the

emission factor for electricity is calculated according to the GHG emissions of the regional or national electricity network.

5.3. Calculation of the GHG emission savings of biodiesel (FAME/HVO)

Biodiesel derived by transesterification of fats with methanol (FAME) or by hydrogenation of vegetable oils (HVO) are regarded in the Renewable Energy Directive as being 100% of renewable origin.

Similar to other inputs, the carbon footprint of the methanol used in the in esterification process (FAME only) needs to be taken into account in the calculation of the GHG emission intensity of the biofuel. This approach has been used in the calculation of the default values. In the case of conventional methanol in the original RED calculations, 0.0585 MJ of methanol was used per MJ of FAME produced, with an emissions factor of 99.57 g CO₂eq per MJ of methanol. This factor is included along with those for other inputs in the list of standard values published in Annex IX of the Implementing Regulation (Annex IX)¹.

5.4. Excess electricity and heat from cogeneration

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

$$C_h = T_h - T_0/T_h$$

where

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

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

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

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

For the purposes of that calculation, the actual efficiencies shall be used, defined as the annual mechanical energy, electricity and heat produced respectively divided by the annual energy input.

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

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

5.4.2. Where a fuel production process produces, in combination, the fuel for which emissions are being calculated and one or more other products (co-products), greenhouse gas emissions shall be divided between the fuel or its intermediate product and the co-products in proportion to their energy content (determined by lower heating value in the case of co-products other than electricity and heat). The greenhouse gas intensity of excess useful heat or excess electricity is the same as the greenhouse gas intensity of heat or electricity delivered to the fuel production process and is determined from calculating the greenhouse intensity of all inputs and emissions, including the feedstock and CH₄ and

N₂O emissions, to and from the cogeneration unit, boiler or other apparatus delivering heat or electricity to the fuel production process. In the case of cogeneration of electricity and heat, the calculation is performed following point 2.5.1.

5.4.3. For the purposes of the calculation referred to in point 2.5.2, the emissions to be divided shall be $e_{ec} + e_l +$ those fractions of e_p , and e_{td} that take place up to and including the process step at which a co-product is produced. If any allocation to co-products has taken place at an earlier process step in the life-cycle, the fraction of those emissions assigned in the last such process step to the intermediate fuel product shall be used for those purposes instead of the total of those emissions. In the case of biofuels and bioliquids, all co-products shall be taken into account for the purposes of that calculation. No emissions shall be allocated to wastes and residues. Co-products that have a negative energy content shall be considered to have an energy content of zero for the purposes of the calculation. Wastes and residues, including tree tops and branches, straw, husks, cobs and nut shells, and residues from processing, including crude glycerine (glycerine that is not refined) and bagasse, shall be considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials irrespectively of whether they are processed to interim products before being transformed into the final product. In the case of fuels produced in refineries, other than the combination of processing plants with boilers or cogeneration units providing heat and/or electricity to the processing plant, the unit of analysis for the purposes of the calculation referred to in point 2.5.2 shall be the refinery.

5.5. Adjustments throughout the chain of custody

Whenever actual values are calculated at each step of the chain of custody, the additional emissions from transport and/or processing need to be added to e_p and/or e_{td} , respectively and expressed in g CO₂ eq/dry ton of soy or intermediate product.

Whenever a processing step yields co-products, emissions need to be allocated as set out in the GHG emission calculation methodology.

The following formula shall be applied to emissions from cultivation when processing intermediate products:

$$\begin{aligned}
 e_{ec} \text{ intermediate product}_a \left[\frac{gCO_2eq}{kg_{dry}} \right] &= e_{ec} \text{ feedstock}_a \left[\frac{gCO_2eq}{kg_{dry}} \right] * \text{Feedstock factor}_a \\
 &* \text{Allocation factor intermediate product}_a
 \end{aligned}$$

Where

Allocation factor intermediate product_a

$$= \left[\frac{\text{Energy in intermediate product}_a}{\text{Energy in intermediate product and co – products}} \right]$$

Feedstock factor_a

$$= [\text{Ratio of kg dry feedstock required to make 1 kg dry intermediate product}]$$

At the last processing step, the emission estimate needs to be converted into the unit CO₂eq/MJ final fuel.

For this transformation, the following formula should be applied to emissions from cultivation:

$$e_{ec} fuel_a \left[\frac{gCO_2eq}{MJ fuel} \right]_{ec}$$

$$= \frac{e_{ec} feedstock_a \left[\frac{gCO_2eq}{kg_{dry}} \right]}{LHV_a \left[\frac{MJ feedstock}{kg_{dry} feedstock} \right]} * Fuel feedstock factor_a * Allocation factor fuel_a$$

Where

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

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

Similarly, also the values for e_p , e_{td} and e_l need to be adjusted. As mentioned above in case of e_p and e_{td} , the emissions from the relevant processing step must be added.

For the purpose of this calculation feedstock factors based on plant data have to be applied. Please note that for the calculation of the feedstock factor the LHV values per dry ton need to be applied while for the calculation of the allocation factor LHV values for wet biomass⁴ need to be used.

6. Averaging of GHG values in mixtures

If consignments of RTRS certified material are mixed, the GHG figures of these consignments cannot be averaged. The organization may either use the highest GHG figure for the entire mixture or assign a GHG figure to each consignment withdrawn from the mixture in the same quantities, as the sum of all consignments added to the mixture.

7. Allocation

The emissions from production (e_{ec}), land use change (e_l) and those fractions of processing (e_p), transport (e_{td}) that take place up to and including the process stage where a co-product is produced shall be divided between the main and the co-products. The GHG emissions shall be divided in proportion to their energy content (except for electricity and heat). The energy content is determined by the lower calorific value. The lower calorific value used shall be that of the entire (co-)product, not only of the dry fraction of it.

If any allocation to co-products has taken place at an earlier process step in the life-cycle, the fraction of those emissions assigned in the last such process step to the intermediate fuel product shall be used for the purpose of allocation.

Main soy (co-)products include for example soy oil and soy meal.

Allocation shall be applied directly after a co-product (a substance that would normally be storable or tradable) and biofuel/bioliquid/intermediate product are produced at a process step. This can be a process step within a plant after which further 'downstream' processing takes place, for either product. However, if downstream processing of the (co-) products concerned is interlinked (by material or energy feedback loops) with any upstream part of the processing, the system is considered a 'refinery' and allocation is applied at the points

⁴ For the purposes of allocation only, the 'wet definition LHV' is used. This subtracts from the LHV of the dry matter, the energy needed to evaporate the water in the wet material. Products with a negative energy content are treated at this point as having zero energy, and no allocation is made. See also 2009/28/EC, Annex V, part C, point 18.

where each product has no further downstream processing that is interlinked by material or energy feedback-loops with any upstream part of the processing.

Since heat does not have a lower calorific value no emissions can be allocated to it on that basis.

No emissions are allocated to wastes and agricultural crop and residues up to the process of collection of those materials. Wastes are any substance or object which the holder discards or intends or is required to discard, including materials that have to be withdrawn from the market for health and safety reasons. Raw materials that have been intentionally modified to count as waste are not considered wastes.

Residues include agricultural, aquaculture, fisheries and forestry residues and residues from related industries or processing. A residue is 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.

General allocation formula

$$emissions_soyproduct_alloc \left[\frac{gCO_2eq}{kg_{soyproduct}} \right] =$$

$$= \frac{emissions_soyproduct \left[\frac{gCO_2eq}{kg_{soyproduct}} \right] * soy_mainproduct [kg] * CVn_soy_mainproduct \left[\frac{MJ}{kg} \right]}{soy_mainproduct [kg] * CVn_soy_mainproduct \left[\frac{MJ}{kg} \right] + soy_coproduct [kg] * CVn_soy_coproduct \left[\frac{MJ}{kg} \right]}$$

where

emissions_soyproduct_alloc: Emissions of the soy product which need to be allocated after a processing step

CVn_soy_mainproduct: lower calorific value soy main product

CVn_soy_coproduct: lower calorific value of soy co-product

Allocation formula example

In this case the disaggregated default values for e_{ec} are used. The disaggregated default value is already allocated and expressed in gCO_2eq/MJ final fuel and does not need to be considered here. For e_{td} and e_p actual values are used. Emissions from production and transport up to the point where co-product are produced (for which allocation is necessary) are allocated as follows. (In this case at the mill where the main product is soy oil and the co-product is soy meal).

$$e_{p+td} _ alloc. \left[\frac{gCO_2eq}{kg_{soyoil}} \right] = \frac{e_{p+td} \left[\frac{gCO_2eq}{kg_{soyoil}} \right] \cdot soyoil [kg] \cdot CVn_soyoil \left[\frac{MJ}{kg} \right]}{soyoil [kg] \cdot CVn_soyoil \left[\frac{MJ}{kg} \right] + soymeal [kg] \cdot CVn_soymeal \left[\frac{MJ}{kg} \right]}$$

$$e_{p+td} - alloc. \left[\frac{gCO_2eq}{MJ_{soybiodiesel}} \right] = \frac{e_{p+td} \left[\frac{gCO_2eq}{kg_{soyoil}} \right] \cdot soyoil [kg]}{soybiodiesel [kg] * CVn_{soybiodiesel} \left[\frac{MJ}{kg} \right]}$$

8. Examples

Standard emission factors for determining e_{ec} , e_p and e_{td} found in Annex IX of the Implementing Regulation shall be used.