

RTFO Guidance Part Two: Carbon and Sustainability Guidance

Post-RED implementation period of
RTFO Year 4:
15 December 2011 to 14 April 2012

Version 4.5, February 2012

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Department for Transport
Great Minster House
33 Horseferry Road
London SW1P 4DR
Telephone 0300 330 3000
Website www.dft.gov.uk

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Executive summary

This guidance document aims to provide assistance on carbon and sustainability (C&S) reporting for fossil fuel and renewable transport fuel suppliers that wish to benefit from receiving Renewable Transport Fuel Certificates (RTFCs) under the Renewable Transport Fuel Obligation (RTFO) as amended in December 2011. It clarifies sustainability criteria for biofuels supplied under the RTFO and how to demonstrate compliance. Throughout this document, we refer to renewable transport fuels as 'biofuels'. The following summary provides an overview of the contents of this guidance and key issues.

Key changes under the amended RTFO

- Mandatory sustainability criteria have been introduced;
- Biofuels from wastes and residues (and ligno-cellulosic and non-food cellulosic feedstocks) will be double counted: these biofuels receive twice as many RTFCs than biofuel from feedstocks not eligible for double counting;
- RTFCs will only be issued once C&S data has been verified;
- Most suppliers will no longer need to submit annual sustainability reports;
- Biofuel that does not meet these sustainability criteria will be counted as fossil fuel and accrue an obligation to supply sustainable biofuel, in the same manner as any other fossil fuel;
- Book and claims systems are no longer an acceptable way of demonstrating chain of custody.

The Renewable Transport Fuel Obligation

The Renewable Transport Fuel Obligation (RTFO) is one of the Government's main policies for reducing greenhouse gas (GHG) emissions from road transport. The RTFO commenced on 15 April 2008 and is intended to deliver reductions in carbon dioxide emissions from the road transport sector by encouraging the supply of renewable fuels. The RTFO has been amended to implement the transport elements of the EU Renewable Energy Directive (RED). Those changes apply to fuels which pass the duty point on or after 15 December 2011.

Under the RTFO, those supplying biofuel must meet specified sustainability criteria in order for their fuels to be recognised as biofuels entitled to the benefit of RTFCs. Obligated fuel suppliers are required to redeem a number of RTFCs in proportion to the volume of fossil fuel and unsustainable biofuel they supply. RTFCs may be earned by any company supplying sustainable biofuels. They may also be bought or sold on an open market. Obligated suppliers also have the option to 'buy out' their obligation, paying a fixed fee per litre of biofuel that would otherwise have to have been supplied to earn RTFCs.

EU Renewable Energy Directive and Fuel Quality Directive

The transport elements of the Renewable Energy Directive (RED) were implemented in the UK on 15 December 2011. The RED is closely linked to the Fuel Quality Directive (FQD) and both directives include mandatory carbon and sustainability requirements that must be met if biofuel is to count towards European targets. Both directives include a number of reporting requirements, outlined below. While the focus of this guidance is on the delivery of the RED through the amended RTFO, much of it is also relevant to those who will have obligations under the FQD.

Reporting carbon and sustainability information

The RTFO Administrator, now the Secretary of State for Transport, requires biofuel suppliers to submit verified data on both the carbon intensity and the sustainability of the biofuels they supply, in order to receive RTFCs. While voluntary carbon and sustainability targets have existed for biofuels in the UK since 2008, implementation of the RED introduces mandatory criteria. Fuel suppliers may no longer report 'unknown' on certain aspects of the sustainability of their biofuels, as was possible in previous reporting periods.

The sustainability requirements for the RED and FQD are identical. When the FQD is implemented, it is expected that obligated parties will supply the same sustainable biofuel to meet their obligation under both directives. The sustainability criteria are that:

- Biofuels must achieve at least a **35% GHG emissions saving** (this threshold will rise over time)¹;
- Biofuels may not be made from raw material obtained from land with **high biodiversity value** in or after January 2008.
- Biofuels may not be made from raw material obtained from land with **high carbon stock** such as forests or land that was undrained peatland in January 2008 unless strict criteria are met.

¹ Under the 'grandfathering clause' biofuels produced in installations that were already operational on 23 January 2008 do not have to meet the 35% threshold until 1 April 2013.

Applying for certificates

Those wishing to apply for RTFCs must have an account with the RTFO Administrator. In general, one RTFC will be awarded for every litre (or kilogram in the case of biogas) of sustainable biofuel supplied. Fuel from certain types of feedstock is incentivised by awarding two RTFCs per litre supplied.

Sustainability data supplied must be verified by a qualified third party (see Verification below) before RTFCs will be awarded. This marks an important change to note in the verification process following the implementation of the RED. In previous reporting periods, suppliers were required to have their data verified annually. Now **certificates will only be issued once data relating to the consignment for which they are being claimed has been verified.**

Suppliers may choose to verify as frequently as they wish, in accordance with the RTFO Administrator's monthly timetable, but must do so at least annually. The Process Guidance and Guidance for Verifiers form part of the [RTFO Guidance](#) and contain the detail on setting up and managing an account with the RTFO Administrator and on the verification process, respectively.

Annual reporting

In most cases, it is expected that suppliers will meet their annual reporting requirements through the information supplied in their applications for RTFCs throughout the year. Therefore **most suppliers will not need to submit a separate annual report.** Details of the exceptions where suppliers may be required to submit an annual report are found in Chapter 3.

Land use for biofuels

The land use criteria under the RED and FQD cover the preservation of carbon stocks and biodiversity. Details on the land use requirements and demonstrating compliance with them can be found in Chapter 4. That chapter also outlines how voluntary schemes may be used to provide evidence of compliance and when it might be appropriate to carry out field audits using the RTFO Biofuel Sustainability Standard. Once the European Commission has published a definition of highly biodiverse grasslands, it will also be possible for suppliers to conduct their own RTFO Biodiversity Audits to demonstrate compliance with the biodiversity criteria.

Greenhouse gas emissions

In order for biofuels to meet the sustainability requirements of the RED, suppliers must be able to demonstrate that their biofuels achieve certain levels of greenhouse gas savings. The level of this threshold will increase over time.

For biofuels produced within the EU, suppliers must also demonstrate that feedstocks were sourced from regions (defined at a NUTS2 level) where typical GHG emissions associated with their cultivation can be expected to be equal to or lower than the default values.

Chapters 5 and 6 of this guidance include information on demonstrating compliance with these requirements, assessing carbon intensity and using default or actual carbon values for feedstock cultivation, biofuel processing and/or transport.

The European Commission has published default carbon intensity values for many of the more commonly used feedstocks which may be used in the place of actual values (see Chapter 5). These defaults are intentionally set conservatively to underestimate carbon savings. Suppliers should report actual values if they wish to demonstrate higher carbon savings, the default does not meet the required 35% carbon saving (including for non-compliant NUTS2 regions), or where no default has been published for a particular feedstock.

Chain of custody and mass balance

It is necessary to be able to track C&S data back to its original source in order to ensure that it can be verified. Mass balance (or a more stringent system) is the only chain of custody system currently permitted under the RED. A mass balance system requires suppliers throughout the supply chain to account for their product on a units in - units out basis but does not require physical separation of certified feedstock or fuel from uncertified feedstock. It ensures that for every unit of sustainable biofuel sold the corresponding sustainable feedstock has been produced.

Suppliers should note that, for the Year 4 obligation period, the mass balance period should not cross the pre-RED and RED periods.

Bulk commodity systems are permitted because they are consistent with the principles of mass balance, i.e. the output is the same as the input. In a significant change to previous reporting periods, **book and claim systems are no longer acceptable evidence** of chain of custody. A more detailed explanation of these systems and advice on when it is appropriate to use existing systems and how to establish a new one if necessary can be found in Chapter 7.

Double counting of wastes and residues

Under the RED, biofuels derived from wastes and residues are 'double counted' i.e. they are worth twice as much, by volume, when calculating progress towards meeting targets. However, they do not count twice for the purposes of meeting the UK's overall renewable energy target under the RED. Biofuels from non-food cellulosic and ligno-cellulosic materials such as *Miscanthus* and woodchips are also double counted. This is to encourage better biofuels that are more sustainable.

Biofuels from feedstocks that are double counted will receive two RTFCs per litre (or kilogram in the case of biogas). Biofuels from wastes and residues (with the exception of agricultural, aquacultural, fisheries² and forestry residues) will also be considered to have automatically met the land use criteria required by the RED and FQD. Their carbon intensity must still be reported, though defaults may be used where available. An explanation of the RTFO Administrator's approach to wastes and residues and the methodology used to assess which materials do and do not qualify for double counting can be found in Chapter 8.

Verification

In order for suppliers to receive RTFCs independent verification (or assurance) of the carbon and sustainability data of their biofuels must be carried out. This must be carried out by a party that is competent to carry out verification against the International Standard on Assurance Engagements (ISAE 3000) or equivalent, which defines requirements for assurance engagements. Guidance on appointing a verifier can be found in Chapter 9 of this document and the full *Guidance for Verifiers* can be found [online](#).

Annexes to this document

The *Carbon and Sustainability Guidance* is supported by a series of annexes which provide supplementary information and insight into the processes followed by the RTFO Administrator when assessing data submitted by suppliers. These annexes cover voluntary schemes, the RTFO Biofuel Sustainability Standard, known future updates to C&S reporting and examples of chain of custody records as well as a glossary of terms.

² In many cases materials from aquaculture and fisheries will automatically meet the land based criteria because these materials are not usually sourced from the land. However, suppliers should check with the Administrator which criteria must be demonstrated on a case by case basis.

1. Introduction

Chapter summary

This chapter outlines the purpose of this document and provides an overview of the legislative framework surrounding it. It provides context on how this document relates to the other parts of the RTFO Guidance and flags other resources that interested parties may find useful when gathering and reporting carbon and sustainability data under the RTFO.

Overview

- 1.1** This document is the *Carbon and Sustainability Guidance* for reporting under the RTFO. This document provides a detailed explanation of how to comply with the sustainability criteria of the RTFO for biofuel suppliers.

Target audience

- 1.2** This document is provided for use by obligated fossil fuel suppliers, biofuel suppliers, verifiers acting on the behalf of suppliers, relevant trade associations and other interested parties.

Legislative framework

- 1.3** Government seeks to reduce the greenhouse gas emissions from the transport sector as part of its wider aim of addressing climate change. The RED sets a target that 10% of energy used in transport must come from renewable sources by 2020. A significant proportion of this target is expected to be met through the supply of sustainable biofuels.
- 1.4** The Renewable Transport Fuel Obligation (RTFO) Order is a legal instrument that encourages reductions in greenhouse gas emissions in the UK by substituting some of the fossil fuels used in road transport with sustainably-sourced biofuels. It is the mechanism through which the transport elements of the RED have been implemented in the UK.
- 1.5** A second EU Directive, the Fuel Quality Directive (FQD), imposes an obligation on fuel suppliers for land transport and related uses in all Member States to achieve at least a six percent reduction in life cycle

greenhouse gas (GHG) emissions in the fuel they supply by 2020 judged against a baseline of average fossil fuel lifecycle emissions.

Renewable Transport Fuel Obligation (RTFO)

- 1.6** Under the RTFO Order (S.I. 2007 No. 3072 as amended) suppliers of road transport fuel are obliged to demonstrate that they have also supplied an amount of sustainable biofuel equivalent to a specified percentage of their total fuel supplied to the UK.
- 1.7** The RTFO came into force on 15 April 2008. When introduced, the RTFO included voluntary sustainability targets. On 15 December 2011 the RTFO was amended in order to transpose the transport elements of the RED into UK legislation. The most significant changes are the introduction of mandatory sustainability criteria for biofuels in the UK and the introduction of double counting for biofuels derived from wastes and residues. Suppliers must demonstrate that their fuels meet these criteria in order for those fuels to contribute to the total volume of renewable fuel they are obliged to account for.
- 1.8** The criteria include a requirement for suppliers to show that their biofuels deliver greenhouse gas reductions of 35% against the equivalent fossil fuel, rising to 50% in 2017 and to 60%, for biofuels from new production plants, in 2018. In addition, the cultivation of biofuel feedstocks should not cause loss of carbon stocks or biodiversity. Under the 'grandfathering clause' biofuels that were produced in installations that were already operational on 23 January 2008 do not have to meet the 35% threshold until 1 April 2013.
- 1.9** Biofuel that does not demonstrably meet the sustainability criteria will be treated as fossil fuel under the Order. This fuel will count towards the supplier's total volume of fossil fuel when calculating the volume of sustainable renewable fuel that it is obliged to supply.

About the RTFO Guidance

- 1.10** The RTFO Guidance comprises three guidance documents which should be read alongside each other. These are described below. *Part One: Process Guidance*, *Part Two: Carbon and Sustainability Guidance* (this document) and *Part Three: Guidance for Verifiers*.

RTFO Guidance Part One: Process Guidance

- 1.11** The *Process Guidance* outlines the mechanics of the reporting process for fuel suppliers from registering and creating an account on the RTFO Operating System (ROS) through reporting fuel volumes and submitting verifier's opinions to trading RTFCs. The *Process Guidance* is available online.

RTFO Guidance Part Two: Carbon and Sustainability Guidance

- 1.12** The *Carbon and Sustainability Guidance* outlines the processes for reporting and verifying carbon and sustainability data to the RTFO Administrator and how to apply for Renewable Transport Fuel Certificates which may be redeemed by those suppliers who are obligated under the Order or traded on an open market.
- 1.13** This document explains how suppliers can demonstrate compliance with the RED's criteria for GHG emission savings and land use, including the requirements for wastes and residues. The guidance also covers the chain of custody and mass balance rules that should be applied.
- 1.14** It also covers the requirement on biofuel suppliers to ensure data supplied to the RTFO Administrator is verified.
- 1.15** As well as the main chapters, there are also five annexes to the *C&S Guidance*. These provide supplementary information as well as outlining some of the processes followed by the RTFO Administrator in assessing C&S data. They cover:
- Voluntary schemes;
 - The RTFO Biofuel Sustainability Standard;
 - Known future updates to C&S reporting;
 - Example chain of custody records;
 - A glossary of terms.
- 1.16** This document relates to biofuels which pass the duty point after the implementation of the transport elements of the RED on 15 December 2011 until the end of the 2011/12 (Year 4) obligation period. For clarity, we will reissue the guidance as Version 5.0 for 2012/13 (Year 5), at the beginning of that reporting period. We do not anticipate any changes between this guidance and the Year 5 guidance, beyond minor updates and clarifications. Any updates made in-year will be available on the DfT website's biofuels pages where guidance for earlier reporting periods may also be found.
- 1.17** This is a guidance document only and does not constitute legal advice on how the Order should be interpreted.
- 1.18** Queries or comments should be directed to the DfT's RTFO Unit at biofuel-sustainability@dft.gsi.gov.uk

RTFO Guidance Part Three: Guidance for Verifiers

- 1.19** The third part of the RTFO Guidance has been produced specifically for verifiers responsible for providing assurance that carbon and sustainability data provided by suppliers is accurate. Biofuel suppliers undertaking verification of their biofuels to apply for RTFCs may also find this a useful resource. The *Guidance for Verifiers* is available online.

Related resources

Tools for greenhouse gas calculations

- 1.20** A number of tools are supplied on [DfT's website](#) to assist suppliers wishing to calculate the GHG emission savings of their biofuels:
- **Carbon Calculator:** The Carbon Calculator is a free software tool available [online](#) to help reporting parties determine the GHG emissions from consignments of biofuels they have supplied, using either defaults or actual values for all or part of the fuel chain. A *User Manual* is also available online. It is strongly recommended that this tool is used if suppliers are using actual data or changing the given defaults within a fuel chain, to reduce the potential for errors. The Calculator can also be used to produce C&S reports which can be uploaded to ROS as part of the application for RTFCs.
 - **Carbon intensity templates:** This spreadsheet provides templates for carbon intensity (greenhouse gas) calculations for each step of the fuel chain. Note that it is recommended that suppliers use the Carbon Calculator for their fuel chain calculations but this spreadsheet is provided should suppliers prefer to perform the calculations manually.
 - **Detailed carbon intensity data:** This spreadsheet contains information on the default fuel chains available for reporting under the RTFO together with data and information that can be used to modify these chains with actual qualitative information or quantitative data. Any updates to the carbon defaults in Annex V of the RED will be included in this file.

Information on voluntary schemes

- 1.21** A table is supplied online listing which voluntary schemes are accepted by the European Commission and/or the RTFO Administrator. For each voluntary scheme the table lists which of the sustainability requirements of the RED they have been recognised as meeting. It also sets out the dates from which these schemes are accepted.

Additional documents

- 1.22** Additional sources and documents relevant to this guidance are available on the DfT website's [RTFO pages](#). Links to related legal instruments and Communications from the European Commission are available on the DfT website's [biofuel legislation pages](#).

2. Reporting biofuel carbon and sustainability information

Chapter summary

This chapter sets out the requirements for carbon and sustainability (C&S) reporting by fuel suppliers to the RTFO Administrator in order to demonstrate compliance with the RED sustainability criteria and gain RTFCs. It includes who needs to report, what information should be reported and when reports should be submitted. It also covers verification requirements.

Introduction

- 2.1** Renewable Transport Fuel Certificates (RTFCs) are the mechanism by which suppliers demonstrate compliance with the RTFO. Suppliers may apply for RTFCs for all sustainable biofuels owned at the duty point. One RTFC is awarded for every litre of sustainable biofuel.
- 2.2** In order to apply for RTFCs, suppliers must submit verified C&S reports which demonstrate compliance with the RED sustainability criteria via an IT system called the RTFO Operating System (ROS).
- 2.3** Some of the sustainability data requirements are not applicable when waste and certain residues are used as biofuel feedstocks. Instructions are provided on reporting in these cases.

Who should report C&S information to the RTFO Administrator

- 2.4** Obligated suppliers (all suppliers of more than 450,000 litres of road transport fuel in a given obligation year) and other suppliers wishing to claim RTFCs are required to report all fuel volumes to the RTFO Administrator. Reporting of fuel volumes and obligations are covered separately in the *Process Guidance*. Obligated suppliers are also required to supply a certain percentage of their road transport fuel as sustainable biofuel and/or to redeem RTFCs sourced from other suppliers of sustainable biofuel. They may also buy out of their obligation.

- 2.5** All suppliers (whether obligated or non-obligated) wishing to apply for RTFCs for their biofuels must report independently verified information on the sustainability of their biofuels to the RTFO Administrator. Account holders who purchase RTFCs do not have any C&S reporting requirements with respect to the purchased RTFCs.
- 2.6** Note that any biofuels which do not meet the mandatory sustainability criteria or which do not receive independent verification will not be awarded RTFCs. The biofuel will be treated as fossil fuel and for suppliers of over 450,000 litres of road transport fuel it will count towards their obligation. See the *Process Guidance* for more information.
- 2.7** Only owners of biofuel at the duty point can apply for RTFCs.

Reporting frequency and timetable

- 2.8** Suppliers must arrange for their data to be independently verified before they can submit an application for RTFCs.
- 2.9** Suppliers may choose how often to apply for RTFCs. RTFCs are issued by the RTFO Administrator on a monthly cycle and applications for RTFCs received after the cut-off date will be processed the following month. The last possible date for certificate applications to be received is 12 August immediately following the end of an obligation period. Applications received after this date may not be processed. Please see the *RTFO Guidance Part One: Process Guidance* for full details.

What to report

- 2.10** The mandatory sustainability criteria of the RED and the information that suppliers should report to demonstrate compliance with these criteria are set out in the following sections.

The requirements of the Renewable Energy Directive

- 2.11** The RED and FQD have set mandatory minimum requirements on the following elements:
- **Greenhouse gas (GHG) emissions savings (Article 17(2)):** Biofuels must achieve at least a 35% GHG emissions saving, increasing to at least 50% from 1 January 2017, and 60% from 1 January 2018 for biofuels produced in installations which started production on or after 1 January 2017. Biofuels produced in installations³ that were already operational on 23 January 2008 do not have to meet the 35% GHG saving threshold until 1 April 2013.

³ See Chapter 5 for the definition of the term 'chain of installations' and related definitions.

- **NUTS2⁴ (Article 19(3))**: For EU crop-based feedstocks, parties are only allowed to use the RED GHG default values if the feedstock is from a region where the typical GHG emissions from cultivation of agricultural raw materials can be expected to be lower than or equal to the emissions in the default value. Regions are defined at the NUTS2 level. Member State reports on emissions from cultivation are published on the European Commission Transparency Platform⁵.
- **Biodiversity (Article 17(3))**: Biofuels may not be made from raw material obtained from land with high biodiversity value at any point during or since January 2008. (Further detail is expected from the European Commission on the definition of highly biodiverse grassland).
- **Carbon stock and peatlands (Articles 17(4) and 17(5))**: Biofuels may not be made from raw material obtained from land with high carbon stock or land that was undrained peatland in January 2008 unless strict criteria are met.
- **Cross compliance (Article 17(6))**: Biofuel feedstocks grown in the European Community must be cultivated according to the European Commission's 'Cross Compliance' requirements (point A and row 9 of the table in Annex II to [Council Regulation \(EC\) No 73/2009](#) of 19 January 2009) and the minimum requirements for good agricultural and environmental condition (see article 6 of the same Regulation).

How to demonstrate RED compliance

- 2.12** C&S reports must contain the information required to demonstrate compliance with the GHG and land (biodiversity, carbon stock and peatlands) criteria. For detailed guidance on how to demonstrate compliance with the land and GHG criteria see Chapters 4, 5 and 6.
- 2.13** It is not required to report information related to the cross compliance criteria.

C&S reporting by administrative consignment

- 2.14** C&S reports on biofuels must be per administrative consignment. An administrative consignment is any amount of product with an identical set of sustainability characteristics. Those characteristics are:
- Fuel type
 - Biofuel feedstock
 - Biofuel production process (if applicable)
 - Country of origin

⁴ Nomenclature of territorial units for statistics, level-2:

http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction

⁵ Member State reports on emissions from cultivation as required by Article 19(2):

http://ec.europa.eu/energy/renewables/transparency_platform/emissions_en.htm

- NUTS2 compliance status or region (for EU feedstocks only)
- Voluntary scheme(s)
- Land use on 1 January 2008
- Plant in operation on 23 January 2008
- Carbon intensity

2.15 Suppliers may operate a site-based mass balance system to allocate sustainability data (administrative consignments) to physical consignments of biofuel. See Chapter 7 for further information and rules on operating a mass balance system.

2.16 A physical consignment may contain more than one administrative consignment. Conversely an administrative consignment may be split between different physical consignments.

2.17 Each administrative consignment must be associated with a particular month's volume of supply (or quarter for those suppliers who report fuel volumes quarterly). The **total volume of the consignments associated with a particular period can not exceed the volume of renewable fuel supplied in that period**. Consignments may be split and entered as separate consignments for more than one period to accommodate this requirement.

2.18 A C&S report and verifier's statement is required for every application for an RTFC and RTFCs will not be issued where no such information has been provided.

How are biofuels produced from wastes and residues treated?

2.19 Under the RED wastes, residues, non-food cellulosic material, and ligno-cellulosic material are double counted towards Member States' renewable transport targets and towards suppliers' obligations. This means that one litre of biofuel (or kg of biogas) produced from wastes/residues will receive two RTFCs.

2.20 For wastes and some types of residues⁶ such as manure and UCO it is not required to report on the land criteria. This means that the following sustainability data is not required:

- whether the biofuel met a voluntary scheme that covers the land criteria (though other voluntary schemes that cover, for example, the GHG calculation or the chain of custody may be relevant);
- land-use on 1 January 08;
- NUTS2 region compliance status.

⁶ The category on ROS called 'waste/non-ag. residues' excludes agricultural, aquacultural, fisheries and forestry residues.

- 2.21** Providing C&S data that demonstrates whether the biofuel met the land criteria, however, is required for agricultural, aquacultural, fisheries⁷ and forestry residues.
- 2.22** Chapter 8 sets out the list of those feedstocks considered wastes and residues and which are agricultural, aquacultural, fisheries and forestry residues for RTFO C&S reporting.

Filling in the C&S report

- 2.23** This section provides a summary of the information that is required within the C&S report. The C&S data should be entered by suppliers onto ROS. Once the C&S data has been independently verified it is submitted to the RTFO Administrator to apply for RTFCs through the ROS system.
- 2.24** Table 2.1 describes the information which should be provided for each consignment of biofuel, as well as which of these data fields are required, and which are elective. Note, however, that for some biofuels the elective fields may influence whether a consignment can be identified as RED compliant.
- 2.25** Suppliers can save incomplete administrative consignments in ROS (i.e. where all the information is not yet available) but will not be able submit these to their verifiers as part of the application for RTFCs until they are complete. The C&S report should not be submitted and RTFCs applied for until the required information is provided and verified.
- 2.26** A free software tool is provided by the RTFO Administrator called the [Carbon Calculator](#) which can be used to prepare C&S reports which can be uploaded to ROS. It can also be used to calculate carbon intensity values using actual data for fuel chains.
- 2.27** An example summary of reported consignments is shown in Table 2.2.

Indicative RED compliant columns

- 2.28** Each of the three columns labelled 'Indicative RED compliant' refer to one of the three categories of mandatory RED sustainability criteria: GHG, biodiversity and carbon stock (including peatlands). The fourth column indicates overall indicative RED compliance.
- 2.29** The columns will automatically populate to indicate whether the biofuel consignment is RED compliant, reading from information already reported. Suppliers and verifiers can use these columns as an indication of whether the consignment meets the mandatory sustainability criteria

⁷ In many cases materials from aquaculture and fisheries will automatically meet the land based criteria because these materials are not usually sourced from the land. However, suppliers should check with the Administrator which criteria must be demonstrated on a case by case basis.

and is ready for verification.

Table 2.1 - Data fields for C&S reporting on ROS

ROS data field and description	Compulsory or elective and reporting options
<p>Administrative consignment number</p> <p>Each consignment number will be unique and generated automatically by ROS.</p>	n/a - automatically generated
<p>Internal reference number</p> <p>Elective data field for the supplier to record their own consignment number for reference purposes.</p>	<p>Elective</p> <p>Free field or leave blank</p>
<p>Fuel type</p> <p>The main fuel types for biofuels are biodiesel, bioethanol, or biogas. Contact the RTFO Administrator if you are supplying other biofuel types.</p>	<p>Compulsory - 'unknown' is not permitted</p> <p>Select fuel type from drop down list</p>
<p>Quantity of fuel</p> <p>Expressed in standard litres for liquid fuel or kilograms in the case of gas. In the case of partially renewable fuels only the renewable component (e.g. 47% of the volume for ETBE)⁸ should be reported.</p>	<p>Compulsory</p> <p>Report the volume (or mass for biogas)</p>
<p>Biofuel feedstock</p> <p>The feedstock type from which the fuel is made e.g. used cooking oil, wheat.</p>	<p>Compulsory - 'unknown' is not permitted</p> <p>Select feedstock from drop down list</p>
<p>Biofuel production process</p> <p>The process used for producing the biofuel may be reported.</p> <p>For most feedstocks the process used does not affect the carbon default (unless using actual data); however, for some feedstocks (EU corn, palm, wheat) there are process-specific carbon default values provided under the RED. For some process types these give better GHG savings than if the process is unknown (note that for EU corn there is no carbon default for unknown process). Therefore, although this field is elective, for those feedstocks with process-specific RED defaults the process must be known in order to report the lower carbon default where relevant and meet the 35% GHG saving</p>	<p>Elective - note this information may be needed to demonstrate compliance with the RED GHG savings threshold for certain feedstocks.</p> <p>Select process from drop down list or leave blank</p>

⁸ See the *Process Guidance* for further information on how to determine the renewable component of partially renewable fuels.

<p>threshold.</p> <p>The relevant process is dependent on the feedstock, but could be, for example:</p> <ul style="list-style-type: none"> - Lignite, natural gas or straw as process fuel in CHP plant for bioethanol from wheat; or - Methane capture (or not) for biodiesel from palm (see Table 5.5). 	
<p>Country of origin</p> <p>The country of origin of the feedstock.</p>	<p>Compulsory</p> <p>Select country from drop down list</p> <p>'Unknown' is only permitted where this information is unavailable AND the supplier can still demonstrate compliance with the GHG and land criteria e.g. by meeting a voluntary scheme.</p>
<p>NUTS2 compliance</p> <p>For EU feedstocks, parties should report whether or not the feedstock is from a region where the typical GHG emissions from cultivation of agricultural raw material can be expected to be lower than or equal to the emissions in the RED default value, a so-called 'compliant NUTS2 region'.</p> <p>If a NUTS2 code is entered this will not be recognised by the indicative RED GHG compliant flag - suppliers should look up whether the region is compliant or not for that feedstock using Member States reports to the Commission or the Carbon Calculator; or report actual data for cultivation. Note that there is not yet a complete list of compliant NUTS2 regions for all Member States.</p> <p>If 'unknown' or 'no' is selected then suppliers will need to report either a voluntary scheme recognised as meeting the GHG criteria (which should have used actual data for cultivation in the GHG calculation), actual data for cultivation, or that the biofuel is grandfathered.</p>	<p>Compulsory for EU crop-based feedstocks</p> <p>Select yes, no, unknown or NUTS2 code from drop down list</p> <p>Defaults to 'n/a' for non-EU countries, and to 'waste/non ag. residue' for feedstocks listed as 'wastes or non-agricultural residues'⁹</p> <p>Defaults to 'unknown' if the country of origin is not known.</p>
<p>Voluntary scheme</p> <p>Three columns are provided to report the voluntary scheme(s) which the biofuel meets. More than one voluntary scheme can be selected to demonstrate compliance with one or more of the RED sustainability criteria¹⁰.</p>	<p>Elective - note this information may be needed to demonstrate compliance with the RED sustainability criteria.</p> <p>Select voluntary scheme from drop down list, leave blank¹², or if the biofuel is not certified, then 'none -feedstock not certified' should be</p>

⁹ The category 'waste/non-agricultural residues' excludes agricultural, aquacultural, fisheries and forestry residues.

¹⁰ The list of voluntary schemes available to be reported and whether they are recognised by the European Commission and/or the RTFO Administrator is available online.

¹¹ It is intended to allow a specific independent audit against the RED biodiversity criteria. However, insufficient detail is currently available from the RED to enable this option.

<p>If the feedstock is a waste or non-agricultural residue, report 'waste/non-ag. residue'⁹. Where the waste/non-agricultural residue also met a voluntary scheme e.g. covering the GHG criteria then this can be reported in the additional voluntary scheme columns.</p> <p>If a specific field audit has been carried out on the farm/plantation against the RTFO Biofuel Sustainability Standard criteria (in the absence of an available voluntary scheme) report 'RTFO Biofuel Sustainability Standard'.</p> <p>If a specific field audit has been carried out against the RED biodiversity criteria (in the absence of an available voluntary scheme) report 'RTFO Biodiversity Audit'¹¹.</p> <p>Note that whether the biofuel met a voluntary scheme may not be needed to demonstrate compliance with the RED sustainability criteria but if it is not provided and verified as part of the application for RTFCs then it must be provided on an annual basis - see Chapter 3.</p>	<p>selected.</p> <p>Note that only those voluntary schemes accepted by the RTFO Administrator (including those recognised by the European Commission) as meeting one or more of the mandatory sustainability criteria are included in ROS.</p> <p>Automatically defaults to 'waste/non ag. residue' for feedstocks listed as 'wastes or non-agricultural residues'⁹.</p>
<p>Land use on 1 Jan 2008</p> <p>This field is used to report the land-use relevant to the feedstock on 1 January 2008 and can be used to demonstrate compliance with the RED carbon stock criteria and, in some cases, the RED biodiversity criteria.</p> <p>For guidance on how to report the land-use on 1 January 2008 see Chapter 4.</p> <p>If the feedstock is a waste or non-agricultural residue (see Chapter 8) report: 'waste/non ag. residue'⁹.</p>	<p>Compulsory</p> <p>Select appropriate land-use from drop down list.</p> <p>'Voluntary scheme - met land criteria' permitted where a voluntary scheme is reported which meets the land criteria if the land use information was not passed down the chain of custody. Where the land use is known it should always be reported.</p> <p>Automatically defaults to 'waste/non ag. residue' for feedstocks listed as 'wastes or non-agricultural residues'⁹.</p> <p>Automatically defaults to 'not applicable' for certain feedstocks for which the land criteria are automatically satisfied including those categories of tallow which do not double count.</p>
<p>Carbon intensity</p> <p>This field is used to report the carbon intensity expressed in gCO₂e/MJ¹³. The carbon intensity calculation, and therefore the figure reported, must</p>	<p>Compulsory</p> <p>The CI field is automatically populated with the appropriate default carbon number for those fuel chains in RED Annex V based on the fuel type,</p>

¹² Whilst leaving blank will not affect an application for RTFCs, this will not meet the requirements for 'additional information' and will necessitate the submission of a verified annual report - see Chapter 3 for details.

¹³ Grams of carbon dioxide equivalent per megajoule.

¹⁴ Note that the cut-off for compliance with the 35% GHG savings threshold is 54.47 gCO₂e/MJ, but the carbon intensity can only be reported as a whole number on ROS. Therefore for biofuels where the calculated carbon emissions are 54.48-54.49 gCO₂e/MJ, these should be rounded up and reported as 55 on ROS, not 54.

<p>include the impact of any direct land-use change.</p> <p>Reporting a carbon intensity of 54 gCO₂e/MJ or less meets the RED threshold of a minimum 35% GHG emission saving¹⁴.</p> <p>For guidance on assessing the carbon intensity of a consignment of biofuel see Chapters 5 and 6.</p> <p>For guidance on assessing the carbon intensity of the impact of land-use change see Chapter 6.</p>	<p>feedstock and process (where applicable). Suppliers should only overwrite this number if actual data is used in the GHG calculation (and must do so in the case of any change in carbon stocks).</p> <p>Note that the CI will not autopopulate for fuel type/feedstock/process combinations not in RED Annex V - suppliers should enter actual data or report 83.8 for grandfathered fuel.</p>
<p>Type of GHG data</p> <p>This field should be completed where actual data has been supplied for:</p> <ul style="list-style-type: none"> - the cultivation stage, or; - for the entire fuel chain. <p>Cultivation data is necessary to demonstrate compliance with the GHG criteria where biofuel feedstock has been sourced from a non-compliant NUTS2 region. Fuel chain data is necessary where a new feedstock has been used (i.e. there is no carbon default available in Annex V of the RED).</p> <p>For guidance on establishing the type of GHG data see Chapter 6.</p>	<p>Elective - note this information may be needed to demonstrate compliance with the RED GHG criteria.</p> <p>Select either:</p> <ul style="list-style-type: none"> - Actual data for cultivation, or - Actual data for entire fuel chain
<p>Soil carbon accumulation</p> <p>This field captures information on whether there has been any soil carbon accumulation due to improved agricultural practice.</p> <p>Note that this information is not needed to demonstrate RED compliance but if it is not provided and verified as part of the application for RTFCs then it must be provided on an annual basis - see Chapter 3.</p>	<p>Elective</p> <p>Select yes, no or leave blank¹⁵</p> <p>Automatically defaults to 'n/a' for feedstocks listed as 'wastes or non-agricultural residues'⁹</p>
<p>Plant in operation on 23 January 2008</p> <p>Under the RED biofuel from installations¹⁶ that were already operational on 23 January 2008 are not obliged to meet the 35% GHG threshold until 1 April 2013. Therefore, to claim RED compliance for a biofuel that does not meet the GHG threshold the supplier will need to demonstrate that the biofuel plant was in operation on 23 January 2008.</p>	<p>Elective - note this information may be needed where an exemption from the RED GHG savings threshold applies.</p> <p>Select yes, no or leave blank</p>

¹⁵ Whilst leaving blank will not affect an application for RTFCs, this will not meet the requirements for 'additional information' and will necessitate the submission of a verified annual report - see Chapter 3 for details.

¹⁶ See Chapter 5 for the definition of the term 'installation'.

Indicative RED compliant columns	
<p>GHG threshold</p> <p>This column reads from the 'NUTS2 compliance', 'Voluntary scheme', 'Carbon intensity', 'Type of GHG data', and 'Plant in operation on 23 January 2008' columns.</p>	<p>Automatically generated</p> <p>Will show a green Y if the RED GHG criteria are met or a red N if not met</p>
<p>Biodiversity</p> <p>This column reads from the 'Voluntary scheme' and 'Land-use on 1 Jan 08' columns.</p>	<p>Automatically generated</p> <p>Will show a green Y if the RED biodiversity criteria are met or a red N if not met</p>
<p>Carbon stock</p> <p>This column reads from the 'Land-use on 1 January 2008' and the 'Voluntary scheme' columns.</p>	<p>Automatically generated</p> <p>Will show a green Y if the RED carbon stock and peatlands criteria are met or a red N if not met</p>
<p>RED compliant (indicative)</p> <p>This column reads from the three previous columns, showing whether the biofuel consignment is indicatively RED compliant.</p>	<p>Automatically generated</p> <p>Will show a green Y if all three of the RED sustainability criteria are met or a red N if not met</p>

Table 2.2 - Illustrative C&S reporting data

General information					Country of origin info.		Voluntary scheme and land use				Carbon information				Indicative RED compliance			
Con. no. ¹⁷	Fuel type	Quantity of fuel, litres/kg	Biofuel feedstock	Production process	Country of origin	NUTS2 compliance	Voluntary. scheme 1	Voluntary scheme 2	Vol scheme 3	Land use on 1 Jan 2008	Carbon intensity ¹⁸	Type of GHG data	Soil carbon accumulation	Plant in operation on 23 Jan 2008?	GHG	Biodiversity	C-stock	RED compliant
01	Bio-ethanol	250,000	Wheat	Unk.	UK	Y	Red Tractor			Cropland - protected	70	-		Y	Y	Y	Y	Y
02	Bio-ethanol	100,000	Wheat	Natural gas CHP	Poland	PL12	RTFO Biodiv. Audit			Cropland - protected	44	-		N	N	Y	Y	N
03	Bio-ethanol	250,000	Ba-gasse	-	Brazil	N/A	-			-	35	Actual fuel chain data		-	Y	N	N	N
04	Bio-diesel	1,000	Oilseed rape	-	UK	Y	Red Tractor	ISCC		Cropland - non-protected	52	-		-	Y	Y	Y	Y
05	Bio-diesel	500,000	Soy	-	Argentina	N/A	-			Grass-land	94	-	Y	Y	Y	N	Y	N
06	Bio-diesel	250,000	UCO	-	UK	N/A	Waste/ non-ag. residue			Waste/ non-ag. residue	14	-		N	Y	Y	Y	Y
07	Biogas	150,000	Dry manure	-	UK	N/A	Waste/ non-ag. residue			Waste/ non-ag. residue	15	-		Y	Y	Y	Y	Y

¹⁷ Supplier consignment number is not shown here but is an available field in ROS.

¹⁸ In gCO₂e/MJ.

Explanations of example data in Table 2.2 - the summary C&S data report

2.30 Consignment 01 represents 250,000 litres bioethanol from wheat of UK origin.

- The wheat was cultivated in a compliant NUTS2 region (i.e. the UK region has been identified as one in which the typical GHG emissions associated with cultivation of wheat can be expected to be lower than or equal to the emissions in the default value) so the supplier does not have to use actual data for cultivation.
- The supplier has reported the default carbon number for wheat (which is permitted as it is from a compliant NUTS2 region and there is no land-use change). The default of 70 gCO₂e/MJ (GHG saving of 16%) does not meet the GHG savings threshold of 35%; however, the biofuel has been 'grandfathered' (i.e. it was produced in an installation that was already operational on 23 January 2008) and therefore **complies with the RED GHG criteria** as grandfathered fuel does not have to meet the 35% threshold until 1 April 2013
- The biofuel supplier can provide verifiable evidence that the wheat is Red Tractor certified. Red Tractor is a standard that has been accepted by the RTFO Administrator as **meeting the RED biodiversity sustainability criteria**.
- As the land-use was 'cropland - protected' on 1 January 2008 the impact of land-use change is 'zero' i.e. the carbon intensity is unaffected. This land category demonstrates that the biofuel **met the RED carbon stock criteria**.
- Since the biofuel has **fully met all of the RED compliant requirements**, ROS automatically generates a 'Y' in the 'RED compliant' column.

2.31 Consignment 02 represents 100,000 litres bioethanol from wheat of Polish origin.

- In this hypothetical situation, Poland has not yet published data on which regions in the country are NUTS2 compliant and which are not. The supplier knows the NUTS2 region in which the wheat was cultivated and reports the region's code - 'PL12'.
- The supplier has reported the carbon default of 44 gCO₂e/MJ (a GHG saving of 47%) for wheat/natural gas with CHP. This is above the GHG savings threshold of 35% specified in the RED; however, this consignment **does not meet the GHG criteria** as no actual data has been provided for the cultivation step (NUTS2 compliance could not be demonstrated) and the fuel has not been grandfathered.
- The feedstock is from an area of cropland that is designated for nature protection purposes. The cropland status demonstrates that it **complies with the RED carbon stock criteria**.

- The supplier has also carried out a successful independent audit against the RED biodiversity criteria (an RTFO Biodiversity Audit) and is able to provide evidence that the feedstock production did not interfere with the nature protection purposes of the land. This consignment therefore also **meets the RED biodiversity criteria**.
- Overall the biofuel scores a **'N' for RED compliance**, as there is no compliance with the GHG criteria.

2.32 Consignment 03 represents bioethanol from bagasse from Brazil.

- The NUTS2 region is not relevant as this only applies to EU feedstocks.
- Bagasse does not have a default carbon intensity value in the RED so actual data has been collected for the entire fuel chain to calculate the carbon intensity of 35 gCO₂e/MJ. This **meets the RED GHG threshold**.
- Unlike wastes and non-agricultural residues the biodiversity and carbon stock criteria are not automatically met for agricultural residues. The supplier has been unable to determine the previous land use and the biofuel did not meet any voluntary schemes. Therefore the supplier has been **unable to demonstrate compliance with the biodiversity and carbon stock criteria**.
- Overall the biofuel scores a **'N' for RED compliance**, as there is no compliance with the biodiversity and carbon stock criteria.

2.33 Consignment 04 represents a consignment of UK oilseed rape that meets multiple voluntary schemes.

- The feedstock was cultivated in a compliant NUTS2 region and no land-use change was reported therefore the carbon default of 52 gCO₂e/MJ can be reported which **meets the GHG threshold**.
- The oilseed rape met the Red Tractor scheme which has been recognised by the RTFO Administrator as **meeting the biodiversity criteria**. In addition, ISCC demonstrates **compliance with the carbon stock criteria** (as well as the biodiversity criteria).
- Since the biofuel has **fully met all of the RED compliant requirements**, ROS automatically generates a 'Y' in the 'RED compliant' column.

2.34 Consignment 05 represents biofuel reported with land-use change.

- The land-use on 1 January 2008 has been identified as 'grassland'. The default chain carbon intensity is 58 gCO₂e/MJ and the land-use change impact has been calculated as 36 gCO₂e/MJ. This has taken into account increased carbon accumulation due to improved agricultural practice. The total, which should be reported, is 94 gCO₂e/MJ and will need to be overwritten in the carbon intensity field which will autopopulate with the default not including land-use change. This carbon intensity does not meet the RED GHG threshold;

however, as the biofuel production plant was operational on 23 January 2008, the grandfathering clause applies and therefore the **GHG criteria is met.**

- No voluntary schemes are reported, so based on the land use reported this biofuel **meets the carbon stock criteria but does not meet the biodiversity criteria.**
- Overall the biofuel scores a **'N' for RED compliance**, as there is no compliance with the biodiversity criteria.

2.35 Consignments 06 and 07 represent biofuels from feedstocks considered wastes or residues.

- The NUTS2 compliance column is only relevant to agricultural feedstocks and is therefore not applicable.
- 'Waste/non-ag. residue' is auto-populated by ROS in the 'Voluntary scheme' and 'Land use' fields.
- No detailed information was available to calculate the carbon intensity therefore the relevant default value is reported (this is also autopopulated in ROS). The carbon intensities reported for these consignments of 14 and 15 gCO₂e/MJ are above the required RED GHG savings threshold and both consignments are therefore **RED compliant for GHG.**
- Wastes and non-agricultural residues automatically **meet both the RED biodiversity and carbon stock criteria.**
- Both of these consignments are therefore **RED compliant overall.**

Arranging verification

2.36 Once data is complete for one or more administrative consignments, and the other requirements set out in the *Process Guidance* have been met, suppliers can choose to apply for certificates or hold data for a future application. To apply for RTFCs suppliers must arrange for the data to be verified.

2.37 Verification must be carried out to the requirements of ISAE 3000 to at least the 'limited' assurance level defined by that standard (or an equivalent standard¹⁹). It must be undertaken by a person who is independent of the supplier and who has the necessary expertise.

2.38 Chapter 9 gives further information on appointing a verifier including guidance on independence and expertise and the ISAE 3000 standard. It also lists the roles and responsibilities of suppliers, verifiers, and the RTFO Administrator in respect of this process and gives a brief outline of the steps a verifier will undertake.

¹⁹ The RTFO Administrator is not aware of any equivalent standards at the time of publication.

- 2.39** It is anticipated that the supplier will be able to 'forward' their C&S data to the verifier on ROS, and that the verifier will be able to examine the data directly. It is anticipated that, once verification is complete, the verifier will return the data to the supplier and upload their assurance opinion. The supplier will then be responsible for submitting the application including the assurance opinion to the RTFO Administrator.
- 2.40** The *Guidance for Verifiers* provides detailed information on the processes which verifiers will undertake. This also provides a useful reference for suppliers preparing for verification.

Changing C&S data

- 2.41** Before C&S data is forwarded to a verifier, the data can be changed at any time.
- 2.42** Once data has been forwarded to a verifier, these data cannot be changed (it is 'locked'), unless the verifier passes the data back without providing an assurance opinion.
- 2.43** Once a verifier has provided an opinion on data, any changes to that data would require a new verification process to take place. Data on ROS will be 'locked' such that this kind of change cannot take place accidentally.
- 2.44** After RTFCs have been issued, data cannot generally be changed. If suppliers become aware of inaccuracies in their data they must let the RTFO Administrator know within 20 days. RTFCs may be revoked in this circumstance.
- 2.45** Data cannot be changed after the reporting deadline of 12 August following the end of the obligation period for which the RTFCs are being applied unless the Administrator expressly authorises it. However suppliers are still required to inform the RTFO Administrator if they become aware of any inaccuracies in the data.

Further guidance and resources

- 2.46** For assistance in using ROS and entering C&S or volume data see the Help screens within ROS.
- 2.47** For further guidance on demonstrating compliance with the land criteria see Chapter 4 and for the GHG criteria see Chapters 5 and 6. For guidance on wastes and residues see Chapter 8. For guidance on operating a mass balance chain of custody system see Chapter 7.
- 2.48** For those uploading their C&S data as csv files to ROS these can be generated by the Carbon Calculator or created in Excel. A list of standard terms for each C&S data field is provided online.

Publication of information

- 2.49** The RTFO Administrator has published regular reports on individual supplier performance and information on the environmental performance of the RTFO as a whole since the implementation of the RTFO in April 2008. Reports are available on the DfT website.
- 2.50** The RTFO Administrator will continue publishing information on the performance of the RTFO. The exact format and frequency of publication for RTFO data post implementation of the RED has not been decided at the time of writing, but once confirmed will be set out on the DfT website biofuel pages and communicated to suppliers and other stakeholders. Individual applications for RTFCs and verifiers opinions will not be published.

3. Annual reporting

Chapter summary

Where all of the relevant information in ROS has been completed for all consignments of fuel for which an RTFC application has been made, suppliers will no longer be required to provide a separate annual report on carbon and sustainability information.

- 3.1** Transport fuel suppliers are required to submit verified C&S information at least on an annual basis where they have applied for RTFCs. These requirements are covered in Chapter 2.
- 3.2** The RED requires that suppliers submit information about the fuels that they supply in addition to the mandatory sustainability criteria²⁰, and that this 'additional sustainability information' must be verified. The information has been included as part of the RTFC application process on ROS.
- 3.3** The additional sustainability information is outlined in Table 3.1, along with an explanation of what action is required by suppliers in order to meet the additional sustainability information reporting requirements.
- 3.4** Where the additional sustainability information has been verified in supplier's RTFC applications, which is anticipated to be the case in most cases, no further action is required by suppliers. However, where some or all of this information is not supplied and verified in RTFC applications suppliers must provide this information with a verifier's assurance report relating to the data by 12 August immediately following the obligation period during which the fuel was supplied.

²⁰ Article 18(3) and Decision (2011/13/EU)

Table 3.1 Additional sustainability information reporting requirements

Additional sustainability information requirement	Acceptable responses for 'additional information' requirements
Whether the fuel has been certified or accepted as fulfilling the requirements of a voluntary scheme that has been recognised by the Commission ²¹	Any voluntary scheme from the drop down list or 'none - feedstock not certified'
Whether the GHG bonus of 29 gCO ₂ eq/MJ has been applied (for degraded land)	'degraded land' ²² in 'land use on 1 Jan 2008' or any other land use category from the list
Whether emissions savings from soil carbon accumulation via improved agricultural management referred to in Annex V of the RED have been used for the GHG calculation	'Yes' or 'No' in 'Soil carbon accumulation' (or 'n/a' for wastes/non ag. residues)

²¹ The Commission may recognise schemes specifically for the purpose of providing additional information on a range of measures including soil, water and air protection in the future. In that case the RTFO administrator will identify what the scheme has been recognised as containing accurate data for.

²² 'Degraded land' cannot be reported until there is a full definition from the Commission.

4. Demonstrating compliance with the land criteria

Chapter summary

This chapter sets out the land criteria of the RED and how suppliers can demonstrate compliance with those requirements. The land criteria cover both preservation of biodiversity and preservation of carbon stocks (including peatlands). There are also requirements in the RED related to cross compliance although suppliers do not currently have to prove compliance with this.

This chapter is not applicable to biofuels derived from wastes and residues (except agricultural, aquacultural, fisheries²³ and forestry residues), or certain feedstocks for which the land criteria are automatically satisfied including those categories of tallow which do not double count.

Land requirements of the RED

4.1 The RED requires that only biofuels from feedstocks meeting the land criteria are counted towards meeting renewable energy obligations such as the RTFO²⁴. The land criteria cover biodiversity, carbon stock, peatlands and cross compliance.

Biodiversity (Article 17(3))

4.2 Biofuels may not be made from raw material obtained from land with high biodiversity value in or after January 2008 including land designated for nature protection purposes. (Further detail is expected from the European Commission on the definition of highly biodiverse grassland.)

Carbon stocks and peatlands (Articles 17(4) and 17(5))

²³ In many cases materials from aquaculture and fisheries will automatically meet the land based criteria because these materials are not usually sourced from the land. However, suppliers should check with the Administrator which criteria must be demonstrated on a case by case basis.

²⁴ Wastes and non-agricultural residues do not need to meet the land criteria, but nonetheless do count towards renewable energy obligations.

- 4.3** Biofuels may not be made from raw material obtained from land with high carbon stock or land that was undrained peatland²⁵ in January 2008 unless the land's status remains unchanged when the raw material is obtained.

Cross compliance (Article 17(6)):

- 4.4** Biofuel feedstocks grown in the European Community must be cultivated according to the European Commission's 'Cross Compliance' requirements (part A and point 9 of Annex II to [Council Regulation \(EC\) No 73/2009](#) of 19 January 2009) and the minimum requirements for good agricultural and environmental condition (see article 6 of the same Regulation).

Demonstrating compliance with the land criteria

- 4.5** The RTFO makes use of existing voluntary agri-environment and social accountability schemes (also referred to as 'voluntary schemes') to minimise the cost and administrative burden of compliance with the RED sustainability criteria. Where these schemes are not available (e.g. for a feedstock or region) it is possible for suppliers to conduct their own field audits against the RTFO Biofuel Sustainability Standard criteria to demonstrate compliance with the land criteria. Once the definition of highly biodiverse grassland is available and the RTFO Order is amended to include this land type it will also be possible for suppliers to conduct their own RTFO Biodiversity Audits to demonstrate compliance with the biodiversity criteria.
- 4.6** As well as utilising voluntary schemes it is also possible to demonstrate compliance with one or more of the land criteria through reporting certain of the previous land use categories. The section below on Demonstrating compliance with the land criteria gives guidance on how to report the land use of biofuel feedstocks and provides further detail on which land use categories are compliant with the RED sustainability criteria.
- 4.7** For partially renewable fuels, the sustainability criteria apply to the renewable part of the fuel. Therefore the land criteria apply to the volume of the partially renewable fuel that has been reported as biofuel²⁶.
- 4.8** The following sections provide an overview of how to demonstrate compliance with each of the land criteria.

Biodiversity

²⁵ Peatland that was not drained (either partially or completely).

²⁶ Unless that volume derives from wastes or non-agricultural residues (that is residues not from agriculture, aquaculture, fisheries or forestry) as these are exempt from the land criteria.

- 4.9** In order to demonstrate compliance with the RED biodiversity criteria suppliers must report one or more of the following:
- A voluntary scheme that covers the RED biodiversity criteria (see table of voluntary schemes available online);
 - The RTFO Biofuel Sustainability Standard;
 - The RTFO Biodiversity Audit²⁷;
 - A land use on 1 January 2008²⁸ of:
 - Cropland - non-protected;
 - Cropland - protected - no interference with nature protection purpose;
 - Highly biodiverse grassland - no change in status²⁹;
 - Forest with canopy cover greater than 30% - no change in status;
 - Forest with canopy cover 10-30%³⁰;
 - Wetland - no change in status, or;
 - Undrained peatland - no change in status
 - Settlement³⁰;
 - Waste/non-agricultural residue³¹; or
 - Not applicable³².
- 4.10** Note that reporting 'cropland - protected/protection status unknown' or 'grassland' does not demonstrate compliance with the biodiversity criteria. In these cases additional evidence would be needed e.g. reporting a voluntary scheme that is recognised as meeting the biodiversity criteria.
- 4.11** There is currently no requirement for suppliers to demonstrate compliance with the highly biodiverse grassland criterion as further detail is expected from the European Commission on its definition. Once available this will be included in the RTFO.

Carbon stock and peatlands

- 4.12** In order to demonstrate compliance with the RED carbon stock and peatlands criteria, suppliers must report one or more of the following:
- A voluntary scheme that covers the RED land carbon stock/peatlands criteria (see table of voluntary schemes available online);
 - The RTFO Biofuel Sustainability Standard;

²⁷ It is intended to allow a specific independent audit against the RED biodiversity criteria. However, insufficient detail is currently available from the RED to enable this option.

²⁸ Land-use type definitions are provided in Table 4.1.

²⁹ Note that it is not currently possible to report this land status as the Commission has not fully defined biodiverse grassland.

³⁰ Note that for these land categories an assessment of change in carbon stock must also take place and be included in the lifecycle GHG emissions reported. Therefore, although these land categories demonstrate compliance with the land criteria they may not comply with the GHG criteria and relevant GHG savings threshold - see Table 4.1.

³¹ The category 'waste/non-agricultural residues' excludes agricultural, aquacultural, fisheries and forestry residues.

³² For certain feedstocks such as tallow the land criteria are inevitably satisfied as the feedstock is neither cultivated nor obtained from land and therefore the previous land use defaults to 'not applicable' in ROS.

- A land-use on 1 January 2008²⁸ of:
 - Cropland - non-protected;
 - Cropland - protected/protection status unknown³³;
 - Cropland - protected - no interference with nature protection purpose;
 - Grassland^{30,33};
 - Forest with canopy cover 10-30%³⁰;
 - Settlement³⁰;
 - Waste/non-agricultural residue³¹; or
 - Not applicable³².

4.13 Note that the RED carbon stock and peatlands criteria do not apply if the land has the same status now as it did in January 2008. The following land categories can therefore also be reported as meeting the carbon stock criteria:

- highly biodiverse grassland - no change in status;
- forest with canopy cover greater than 30% - no change in status;
- wetland - no change in status, or;
- undrained peatland - no change in status.

Cross compliance

4.14 The Secretary of State must keep under review the extent to which UK feedstocks used for biofuels have been obtained in accordance with cross compliance requirements. Suppliers are not required to demonstrate that their fuels meet cross compliance requirements.

Voluntary schemes

4.15 As outlined in the previous sections a reporting party can demonstrate RED-compliance with one or all of the above criteria by using one or more voluntary schemes. In order to report a voluntary scheme for compliance purposes, the version of the scheme being used should be recognised by the European Commission or the RTFO Administrator as meeting the requirements. Verifiers may, however, consider other voluntary schemes as part of the evidence (note that these will not be available for reporting on ROS).

4.16 Voluntary schemes are recognised by the European Commission for a specific scope and are automatically recognised in the RTFO for the same scope. For example, they might be recognised as meeting one or more of the land-use criteria, the GHG criteria (including the possibility to calculate actual values), and/or the mass balance chain of custody. The voluntary schemes recognised by the European Commission and the

³³ Note that reporting 'cropland - protected/protection status unknown' or 'grassland' does not demonstrate compliance with the biodiversity criteria. In these cases additional evidence would be needed e.g. reporting a voluntary scheme that is recognised as meeting the biodiversity criteria.

scope for which they are recognised are listed in the table of voluntary schemes online³⁴.

- 4.17** Parties in the supply chain should be audited against the version of the voluntary scheme that the European Commission recognises. (See Annex A for the process for inclusion of European Commission-recognised voluntary schemes in the RTFO.)
- 4.18** The RTFO Administrator has also benchmarked a number of schemes against the RED land criteria and these can also be used to demonstrate compliance where they fully met the biodiversity and/or carbon stocks/peatland criteria.
- 4.19** Note that these benchmarks were conducted for indicative purposes before all details of the RED and Communications were published and therefore do not guarantee that these voluntary schemes will pass assessment by the European Commission. Where these schemes have been subsequently benchmarked by the European Commission then the European Commission's assessment supersedes any assessment by the RTFO Administrator.
- 4.20** Where a voluntary scheme does not meet all of the land criteria, for example, Red Tractor has been recognised by the Administrator as meeting the biodiversity but not the carbon stocks criteria of the RED, then suppliers will need to demonstrate compliance with the other criteria through another voluntary scheme or by reporting an appropriate land category. In this situation suppliers could report Red Tractor plus any of the cropland categories listed in Table 4.1, for example.
- 4.21** It may only be claimed that a biofuel met a voluntary schemes where the chain of custody rules (where applicable) of the voluntary scheme have been complied with. The supplier should either be certified under the voluntary scheme or, where it is not certified, check with the voluntary scheme before a claim is made. Gaps within a chain of custody are generally not permitted by the voluntary scheme whilst some schemes may allow the final party reporting to the Administrator to make a claim where they have sourced directly from a certified supplier.

The RTFO Biofuel Sustainability Standard

- 4.22** The RTFO Biofuel Sustainability Standard can also be used to demonstrate compliance with the RED land criteria.

³⁴ The RED also permits the use of recognised bilateral or multilateral agreements concluded by the European Union with third countries to demonstrate compliance with sustainability requirements. At the time of writing the RTFO Administrator is not aware of any bilateral or multilateral agreements under discussion with the European Commission. However, should any agreements be announced, the RTFO Administrator would include this as a reporting option for economic operators in an appropriate manner.

- 4.23** The RTFO Biofuel Sustainability Standard comprises five environmental and two social principles as well as a norm for audit quality. These are sub-divided into a number of criteria and indicators which are set out in Annex B. Suppliers are able to undertake independent third party audits against these criteria as one means of proving compliance with the RED land criteria.
- 4.24** It was originally developed as a meta-standard against which standards were benchmarked. These benchmarks determined whether the standard could be used by suppliers as a means of meeting the voluntary reporting targets on environmental sustainability.
- 4.25** It was also developed to be used by suppliers as a tool to audit against where voluntary sustainability schemes were not yet operational. This aspect of the standard will remain as an option for suppliers to use but it is not intended that any further benchmarks of voluntary schemes will be conducted against the principles and criteria.
- 4.26** To demonstrate compliance with the full RTFO Biofuel Sustainability Standard, parties must carry out an independent third party audit against the full RTFO Biofuel Sustainability Standard criteria, in which the requirements of the RTFO's norm for audit quality are met. The requirements of the norm for audit quality are divided into 'major musts' which have to be met in order to comply, and 'minor musts' which should be treated as recommendations only.
- 4.27** The RTFO Administrator **strongly recommends** that in cases where an existing voluntary scheme is operational which has been recognised by the European Commission or the RTFO Administrator for the RED land criteria, parties do not carry out independent audits against the RTFO Biofuel Sustainability Standard.

The RTFO Biodiversity Audit

- 4.28** Once the definition of highly biodiverse grassland is available from the European Commission and included in the RTFO Order the RTFO Administrator intends to allow suppliers to conduct independent third party audits against the RED biodiversity criteria as a means of demonstrating compliance. It is therefore not currently possible for suppliers to report this.
- 4.29** The RTFO Administrator **strongly recommends** that in cases where an existing voluntary scheme is operational which has been recognised by the European Commission or the RTFO Administrator for the RED land or biodiversity criteria, suppliers do not carry out an RTFO Biodiversity Audit.
- 4.30** Suppliers will also need to demonstrate compliance with the carbon stocks criteria e.g. through a voluntary scheme or reporting an appropriate previous land use category.

4.31 More detail will be added once available.

Land-use categories and RED compliance

4.32 As outlined in the previous sections, suppliers can also meet the land criteria by sourcing feedstocks from qualifying land. This can be reported through the 'land use on 1 Jan 08' field in ROS.

4.33 There are 11 land-use categories based on the requirements of the RED (see Table 4.1).

4.34 Some land use categories are not permitted to be used for biofuel feedstock production under the RED unless it can be proven that the status of the land was not changed (highly biodiverse grassland, cropland and other land categories protected for nature protection purposes, forestland, undrained peatland, wetland). Other land use categories are permitted to be used, but any change in carbon stock must be taken into account for reporting the carbon intensity of the biofuel (grassland, forest with canopy cover of 10-30%, degraded land, settlement).

4.35 Note that some land use categories also meet the RED biodiversity criteria e.g. 'cropland - non-protected'.

4.36 It should also be noted that the categories 'cropland', 'grassland' and 'forestland' specifically refer to the land cover, while the categories 'undrained peatland' and 'wetland' refer to other characteristics of the land, such as soil properties, that are not mutually exclusive with the former. For example, a forest may be located on undrained peatland, and grassland may be located on a wetland. The land types 'undrained peatland' and 'wetland' and their variations should always be reported in precedence over the land types 'cropland', 'grassland' and 'forestland' and their variations. For example, if a plantation is located on land that was undrained peatland on 1 January 2008 then this should always be reported as undrained peatland, irrespective of whether it had forest, grassland or cropland on it.

4.37 In some cases the actual land cover may not be the same as the land category designated in a country's land registry. For example, it is feasible that the land is/was designated for future agricultural purposes in a land registry, but the actual land cover (e.g. determined by site visits or other records) is forestland. The actual land cover or type should always be reported.

4.38 Cropland specifically refers to land that is under control of the farm or plantation. It is feasible that the land under control of the farm is not exclusively cropland, but also includes other land uses (e.g. forestland). If the land cover does include forestland, it will have to be demonstrated that there has been no conversion of that forestland after January 2008.

However, in an instance where the land used to produce the feedstock is cropland, 'cropland' should be reported.

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Table 4.1 - Land-use categories and RED compliance

Land-use in January 2008	Description ³⁵	Compliance with RED carbon stock criteria ³⁶	Compliance with RED biodiversity criteria ³⁶
Cropland - non-protected	<p>This category includes cropped land, (including rice fields and set-aside³⁷), and agro-forestry systems where the vegetation structure falls below the thresholds used for the forest categories³⁸.</p> <p>The cropland is not in a nature-protected area as defined in RED Article 17(3b).</p>	This category of land automatically complies with the RED high carbon stock and peatland criteria.	This category of land automatically complies with the RED biodiversity criteria.
Cropland - protected - no interference with nature protection purpose	<p>Same as above, but the cropland is in a nature protection area as defined in RED Article 17(3b) and the production of the raw material did not interfere with the nature protection purpose.</p> <p>Evidence that the production of the biofuel feedstock did not interfere with the nature protection purposes of the land may be achieved through reporting a voluntary scheme that meets the RED biodiversity criteria or the RTFO Biodiversity Audit³⁹.</p>	This category of land automatically complies with the RED high carbon stock and peatland criteria.	This category of land automatically complies with the RED biodiversity criteria.
Cropland - protected/protection status unknown	<p>This category of cropland should be reported where:</p> <p>a) the cropland had protected status but evidence</p>	This category of land automatically complies with the high carbon stock and peatland criteria.	This category of land does not comply with the RED biodiversity criteria.

³⁵ The definitions for 'forest greater than 30%', 'forest 10 to 30%', 'wetland' and 'degraded land' are taken from the RED. Any further detail published by the European Commission on these definitions will be included in a future version of the Guidance.

³⁶ The RED biodiversity criteria, carbon stock criteria and peatland criteria are RED Articles 17(3), (4) and (5), respectively. Note that compliance with these criteria in the RED can also be achieved through meeting an appropriate voluntary scheme or a combination of a voluntary scheme and an appropriate land category.

³⁷ Set-aside is a term related to the EU's Common Agricultural Policy (CAP). It refers to land taken out of production to reduce the risk of food surpluses, while increasing the opportunity for environmental benefits. From 2007 set-aside land has been abolished under the CAP.

³⁸ Perennial crop plantations are classed as cropland under the RTFO.

³⁹ It is intended to allow a specific independent audit against the RED biodiversity criteria. However, insufficient detail is currently available from the RED to enable this option.

	<p>could not be provided that there was no interference with the nature protection purpose as defined in RED Article 17(3b); or</p> <p>b) the protection status could not be determined.</p>		
<p>Grassland (and other wooded land not classified as forest)</p>	<p>This category includes rangelands and pasture land that are not considered cropland, but which have an agricultural use. It also includes grasslands without an agricultural use.</p> <p>It additionally includes systems with woody vegetation and other non-grass vegetation such as herbs and brushes that fall below the threshold values used in the forest land categories including both those with and without an agricultural use. It includes extensively managed rangelands as well as intensively managed (e.g. with fertilisation, irrigation, species changes) continuous pasture and hay land.</p>	<p>This category complies with the high carbon stock and peatland criteria but the GHG emissions of the resulting land-use change must be taken into account and the relevant GHG threshold must be met.</p>	<p>As the European Commission has not yet published guidance on highly biodiverse grassland, it is not currently possible to demonstrate compliance with the RED biodiversity criteria through reporting this land category.</p>
<p>Highly biodiverse grassland - no change in status</p>	<p>The definition of highly biodiverse grassland has not yet been provided by the Commission. When it is available it will be incorporated into legislation (in the RTFO Order) and the <i>C&S Guidance</i> updated. It is therefore not currently possible to report this category.</p> <p>This category cannot be reported for natural grassland that is highly biodiverse. It should only be reported for non-natural highly biodiverse grasslands where evidence is provided that harvesting of the raw material is necessary to preserve its grassland status.</p>	<p>This category will also comply with the high carbon stock and peatlands criteria.</p>	<p>When the definition is available this category will comply with the RED biodiversity criteria.</p>
<p>Forest greater than 30% canopy cover - no change in status</p>	<p>Continuously forested areas, namely land spanning more than one hectare with trees higher than five metres and a canopy cover of more than 30%, or trees able to reach those thresholds in situ.</p>	<p>This category complies with the high carbon stock criteria and should only be reported if evidence is provided that the status of the land has not</p>	<p>This category of land complies with the biodiversity criteria - it should only be reported if it can be demonstrated that the forest in question was not a primary forest (and other wooded land with no signs of</p>

		changed compared to January 2008.	human disturbance such as logging), and that the land was not in a protected area ⁴⁰ .
Forest 10 to 30% canopy cover	Land spanning more than one hectare with trees higher than five metres and a canopy cover of between 10% and 30%, or trees able to reach those thresholds in situ.	This category complies with the high carbon stock criteria - the GHG emissions of any resulting land-use change must be taken into account and the relevant GHG threshold must be met.	This category of land complies with the biodiversity criteria - it should only be reported if it can be demonstrated that the forest in question was not a primary forest (and other wooded land with no signs of human disturbance such as logging), and that the land was not in a protected area ⁴⁰ .
Wetland - no change in status	Land that is covered with or saturated by water permanently or for a significant part of the year.	This category complies with the high carbon stock criteria and should only be reported if evidence is provided that the status of the land has not changed compared to January 2008.	This category of land complies with the biodiversity criteria and should only be reported if it can be demonstrated that the wetland in question was not primary forest (and other wooded land with no signs of human disturbance such as logging), in a designated area ⁴⁰ , or a highly biodiverse grassland.
Undrained peatland - no change in status	Undrained peatland is peatland that was not completely drained in January 2008. This includes peatland that was not drained at all and peatland that was partially drained.	This category complies with the high carbon stock criteria and should only be reported if evidence is provided that the land has not been further drained.	This category of land complies with the biodiversity criteria and should only be reported if it can be demonstrated that the peatland in question was not a primary forest (and other wooded land with no signs of human disturbance such as logging), in a designated area ⁴⁰ , or a highly biodiverse grassland (unless there has been no change in status/interference with nature protection purposes).
Degraded land	A full definition of 'degraded land' is not yet available from the European Commission. The land was not in use for agriculture or any other	Without a full definition of degraded land from the Commission it is not possible to assess whether or not degraded land automatically complies	Without a full definition of degraded land from the Commission it is not possible to assess whether or not degraded land automatically complies with the RED

⁴⁰ Unless evidence is provided that the production of that raw material did not interfere with those nature protection purposes.

	<p>activity in January 2008; and falls into one of the following categories:</p> <p>a) 'severely degraded land', including such land that was formerly in agricultural use and that, for a significant period of time, has either been significantly salinated or presented significantly low organic matter content and has been severely eroded; or</p> <p>b) 'heavily contaminated land' that is unfit for the cultivation of food and feed due to soil contamination.</p>	<p>with the RED sustainability requirements. This cannot be reported until there is a full definition from the Commission.</p>	<p>sustainability requirements. This cannot be reported until there is a full definition from the Commission.</p>
Settlement	<p>Includes all developed land, including transportation infrastructure and human settlements of any size, unless they are already included under other categories. Examples of settlements include land along streets, in residential (rural and urban) and commercial lawns, in public and private gardens, in golf courses and athletic fields, and in parks, provided such land is functionally or administratively associated with particular cities, villages or other settlement types and is not accounted for in another land use category⁴¹.</p>	<p>This category of land automatically complies with the RED high carbon stock and peatland criteria. However, the GHG emissions of any carbon stock change must be taken into account and the relevant GHG threshold must be met.</p>	<p>This category of land automatically complies with the RED biodiversity criteria.</p>

⁴¹ This definition is taken from the 2006 IPCC Guidelines for National GHG inventories (Vol 4). The RED recommends that this source is used by the European Commission in developing its guidelines on the calculation of land carbon stocks.

Further guidance/resources

- 4.39** The Commission has produced a guidance document for economic operators to help identify the status of the land in January 2008 and therefore demonstrate compliance with the RED land use criteria: *Inventory of data sources and methodologies to help identify land status*⁴². It has no formal legal status.
- 4.40** The European Committee for Standardisation (CEN) is preparing guidance on the principles, criteria, indicators and verifiers to show that biofuels and bioliquids are sustainably produced.
- 4.41** The Department for Environment, Food and Rural Affairs (Defra) have also compiled a list of evidence sources within the UK that might be used to show that biofuels grown in the UK have been sourced in a manner that is consistent with the sustainability criteria in the Renewable Energy Directive to assist economic operators.
- 4.42** Other sources of information include:
- Reference maps within voluntary schemes accepted by the European Commission;
 - GlobCover
 - MODIS
 - Landsat
 - USDA Cropland Data Layers
 - Harmonised World Soil Database, FAO

⁴² http://ec.europa.eu/energy/renewables/biofuels/sustainability_criteria_en.htm

5. Demonstrating compliance with the greenhouse gas savings criteria

Chapter summary

This chapter sets out the greenhouse gas (GHG) requirements of the RED and how suppliers can demonstrate compliance with those requirements. Guidance is provided on how to assess the carbon intensity of biofuel consignments through the use of defaults.

Suppliers using actual data to report the carbon intensity of their biofuel should refer to Chapter 6.

Terminology

5.1 The following terminology will be used throughout this chapter:

- The **carbon intensity** of a biofuel refers to the lifecycle emissions of greenhouse gases from a biofuel supply chain. It is expressed in units of carbon dioxide equivalents per mega joule of biofuel.
- **Carbon defaults** are carbon intensity values provided by the Commission for a number of biofuel feedstocks, also referred to as **defaults**.
- The carbon defaults are the sum of **disaggregated defaults** for cultivation, processing and transport.
- **Carbon saving** or **greenhouse gas saving** refers to the GHG emissions savings of the biofuel relative to the fossil fuel it replaced. It is calculated by comparing the carbon intensity of the biofuel with the fossil fuel comparator.
- **Fossil fuel comparator** is the average carbon intensity of petrol and diesel supplied in the EU and is currently set as 83.8 gCO₂e/MJ.
- The term '**installation**' includes any processing installation used in the production process. It should not be understood as including production facilities that might have been intentionally added to the production chain only to qualify for the exemption foreseen in this provision. If at least one such processing installation used in the

production chain was in operation on 23 January 2008 at the latest the criterion of a minimum 35 % greenhouse gas saving starts to apply only from 1 April 2013. In addition, if an investment has been made after 23 January 2008 in an existing installation to convert it for the purpose of producing biofuels this installation would not qualify for the exemption.

- **'Grandfathering'** refers to biofuels produced in installations before certain dates and affects the GHG savings requirements. This is set out in Table 5.1.
- Nomenclature of Territorial Units for Statistics or NUTS is a method of defining regions within European countries employed by the European Commission. **NUTS2** refers to the second level on the scale and divides the EU into 271 regions.
- **NUTS2 compliance** refers to whether the emissions from cultivation for a particular biofuel feedstock are greater than (NUTS2 non-compliant) or equal to/less than (NUTS2 compliant) the disaggregated default for cultivation.

Greenhouse gas savings requirements of the RED

GHG emissions savings (Article 17(2))

- 5.2** Biofuels must achieve at least a 35% GHG emissions saving, increasing to at least 50% from 1 January 2017, and 60% from 1 January 2018 for biofuels produced in installations which started production on or after 1 January 2017. Biofuels produced in installations that were already operational on 23 January 2008 do not have to meet the 35% GHG saving threshold until 1 April 2013 (the so-called 'grandfathering clause') - see Table 5.1.

Table 5.1 Minimum GHG saving thresholds and grandfathering periods for biofuel installations

Period	Date production started at an installation		
	Pre 23/01/2008	Post 23/01/2008	Post 01/01/2017
05/12/2010 to 31/03/2013	No criteria	35%	N/A
01/04/2013 to 31/12/2016	35%	35%	N/A
01/01/2017 to 31/12/2017	50%	50%	50%
01/01/2018 to 31/12/2020	50%	50%	60%

NUTS2⁴³ (Article 19(3))

5.3 For EU crop-based feedstocks, parties are only allowed to use the RED GHG default values if the feedstock is from a region where the typical GHG emissions from cultivation of agricultural raw materials can be expected to be lower than or equal to the emissions in the default value (a 'compliant NUTS2 region'). Regions are defined at the 'NUTS2' level. Member State reports on emissions from cultivation are published on the European Commission Transparency Platform⁴⁴.

Demonstrating compliance with the GHG criteria

5.4 In order to demonstrate compliance with the RED GHG criteria suppliers of biofuel must be able to:

- Report a carbon intensity of 54.47 gCO₂e/MJ⁴⁵ or less (equivalent to a minimum 35% GHG emission saving); or
- Report that the biofuel was produced in an installation which was already operational on 23 January 2008⁴⁶; or
- Report that the biofuel meets a voluntary scheme recognised by the RTFO Administrator for demonstrating compliance with the GHG criteria⁴⁶; and
- For EU crop-based feedstocks, parties must report whether the feedstock is from a compliant NUTS2 region. For EU biofuels not from a compliant NUTS2 region suppliers are not allowed to use a carbon default value and must use actual data to calculate the carbon intensity of the cultivation stage⁴⁷. If the NUTS2 compliance status is not known, then the fuel is not considered to be RED-compliant. An exception is permitted where the biofuel is grandfathered - in this case the fuel level default can be reported for non-compliant or unknown NUTS2 regions. See section on NUTS2 (Article 19(3)).

Assessing the carbon intensity of your biofuel

⁴³ Nomenclature of territorial units for statistics, level-2:

http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction

⁴⁴ Member State reports on emissions from cultivation as required by Article 19(2):

http://ec.europa.eu/energy/renewables/transparency_platform/emissions_en.htm

⁴⁵ Note that the cut-off for compliance with the 35% GHG savings threshold is 54.47 gCO₂e/MJ, but the carbon intensity can only be reported as a whole number on ROS. Therefore for biofuels where the calculated carbon emissions are 54.48-54.49 gCO₂e/MJ these should be rounded up and reported as 55 on ROS, not 54.

⁴⁶ Note that the carbon intensity must still be reported.

⁴⁷ Suppliers of biofuels derived from EU feedstocks wishing to use the GHG defaults are therefore required to provide evidence that their feedstock is from a NUTS2 compliant region. NUTS2 information is not required for EU biofuels using actual carbon data for cultivation. The RTFO Administrator does not intend to disclose NUTS2 regional information for individual suppliers.

- 5.5** The carbon intensity of a consignment of biofuel can be assessed by:
- Selecting the appropriate default value; or
 - Collecting information about the way in which it was produced in order to calculate an actual carbon intensity; or
 - Combining actual data with default input data or disaggregated default values.
- 5.6** This chapter outlines how to report the carbon intensity of your biofuel using the carbon defaults set out in Annex V of the RED.
- 5.7** Suppliers wishing to include actual data in the calculation of GHG emissions from their biofuels should follow the guidance in Chapter 6.
- 5.8** A free software tool is provided by the RTFO Administrator called the [Carbon Calculator](#) which can be used to calculate carbon intensity values using actual data for fuel chains and to prepare C&S reports which can be uploaded to ROS and submitted (once verified) to the RTFO Administrator to apply for RTFCs.

The RED GHG calculation methodology

- 5.9** The GHG calculation methodology in the RED is based on a well-to-wheels approach that includes all significant sources of direct GHG emissions. This enables comparison of fuel chain GHG savings on a like for like basis.

The RED carbon defaults

- 5.10** The RED provides carbon emissions for a number of biofuel chains in Annex V. For each biofuel chain a 'typical' and 'default' carbon intensity emission value is supplied, as well as a breakdown of the emissions from each of the three main stages of the supply chain that is cultivation, transport and processing (termed 'disaggregated defaults').
- 5.11** All the fuel chain default values available for suppliers to report in the RED are 'conservative' i.e. they are designed to under estimate carbon savings rather than over estimate them. The approach taken by the European Commission to make a typical default value conservative is to multiply the 'conversion' stage GHG emissions by a 'conservative factor'. This multiplier is currently 1.4. This conservative factor can be removed by collecting and using actual data in the GHG calculation. See section on Removal of the conservative factor in Chapter 6 for details.
- 5.12** Carbon default values are available in RED Annex V for:

- Bioethanol, ETBE⁴⁸ and TAAE⁴⁹ from sugar beet, sugar cane, wheat and European Community produced corn (natural gas as process fuel in CHP plant).
- FAME⁵⁰ biodiesel from oilseed rape, palm, soy beans, sunflower, UCO and tallow (excluding category 3)⁵¹;
- Hydrotreated biodiesel (dedicated processing only, not co-processed) from oilseed rape, palm, sunflower;
- Biogas (as CNG⁵²) from dry manure, wet manure and municipal organic waste;
- Pure plant oil from oilseed rape.

5.13 Annex V of the RED also includes default values for several 'future biofuels' (see Part B and E of Annex V).

5.14 It should be noted that the default values do not take into account potential direct or indirect land-use change impacts. Any direct land-use change must be taken into account and the additional emissions added to the default value.

5.15 In line with the RED wastes, processing residues and agricultural residues are attributed with zero GHG emissions up to the process of collection of those materials (see Paragraph 18 of Annex V). The process of collection may involve transportation of the material and any emissions of this transport step should therefore be included.

5.16 For partially renewable fuels, the sustainability criteria apply to the renewable part of the fuel. Therefore it is permitted to report an appropriate carbon default for the volume of the partially renewable fuel that has been reported as biofuel.

Reporting using the fuel chain default values

When can a default be used to demonstrate compliance with the GHG criteria?

5.17 Suppliers must always report the default value; use actual data; or a combination of disaggregated defaults and actual data (see Chapter 6 for guidance on the use of actual data). Suppliers may not use the typical

⁴⁸ Ethyl tertiary butyl ether

⁴⁹ Tertiary amyl ethyl ether

⁵⁰ Fatty acid methyl ester

⁵¹ UCO and tallow (excluding category 3 tallow) use the European Commission default value for 'waste vegetable and animal oil'. The RED specifically excludes the use of this default value for category 3 tallow. If the tallow is uncategorised (e.g. from outside the EU), the European Commission default value can be used.

⁵² Compressed natural gas

values although Member States are permitted to use these in their biennial reports to the Commission.

5.18 It should be noted that **in order for a consignment to be RED-compliant**, there are specific conditions under which default values must **not** be reported as the carbon intensity of a consignment:

- If no carbon default is available for RED Annex V, actual data must be reported for the entire fuel chain.
- Where the carbon default does not meet the relevant GHG saving threshold (unless the fuel is grandfathered).
- When emissions from land-use change are greater than zero a calculation of the emissions from land-use change should also be added to the default value (note that the previous land use must be determined and unknown land-use change cannot be reported) - see Chapter 6 for further guidance.
- When the biofuel is made from an EU crop based feedstock from a 'non-compliant' NUTS2 region. (see section on NUTS2 (Article 19(3))).

What type of default can be used?

5.19 There are three different types of fuel chain default values:

- fuel level defaults;
- biofuel feedstock level defaults, and;
- process level defaults.

5.20 Fuel level defaults may only be used where the biofuel has been processed in a 'grandfathered' chain of installations⁵³ and:

- there is no feedstock or process default available in RED Annex V (also included in this guidance in Table 5.4 and Table 5.5); or
- there is a feedstock or process default but the NUTS region is non-compliant or unknown.

5.21 If the biofuel feedstock does not have a default value and the biofuel is not grandfathered then actual data must be used for the entire fuel chain to determine the GHG emissions.

5.22 Biofuel feedstock level defaults are used where the feedstock is known but the process is unknown or is not available in RED Annex V (see Table 5.3).

5.23 Process level defaults are used where information is also known about how the fuel was produced e.g. a process in which a natural gas CHP

⁵³ A 'grandfathered chain of installations' is one in which at least one of the installations was in operation on 23 January 2008. Note that grandfathered biofuel is exempt from meeting the 35% GHG saving emission threshold until 1 April 2013.

plant is used at the biofuel plant. However, process carbon defaults are only available for a limited number of feedstocks in RED Annex V (see Table 5.4).

This is summarised in Table 5.2 together with a cross reference to the relevant default value table. The appropriate default value selected from the tables below is then reported in a supplier's C&S report to the RTFO Administrator.

Table 5.2 - Cross-reference to relevant default value table				
Feedstock default available in RED Annex V	Process known?	Process default available in RED Annex V	Type of default value	Default value table
No	n/a	No	Fuel level default if grandfathered.	Table 5.3
			For non-grandfathered fuel - actual data must be used	n/a - see Chapter 6 for how to calculate actual GHG emissions
Yes	Known or unknown	No	Feedstock	Table 5.4
	Known	Yes	Process	Table 5.5

Default value tables

5.24 Note that the figures in the tables are conservative and may not represent typical practice. Those defaults that do not meet the 35% GHG saving threshold are marked with an asterisk. Any carbon defaults added to Annex V of the RED within an obligation year will be added to the detailed carbon intensity data spreadsheet available online.

5.25 The fuel default value should only be reported for grandfathered fuel for which there is no default in the RED (this includes biofuel derived from feedstock from a non-compliant NUTS2 region).

Table 5.3 - Fuel default value		
Fuel	Carbon Intensity (gCO ₂ e/MJ)	Carbon saving (%)
Biofuel	83.8	0

Table 5.4 - Feedstock default values

Fuel	Feedstock	Carbon intensity (gCO ₂ e/MJ)	Carbon saving (%)
Bioethanol, ETBE ⁵⁴ , TAE ⁵⁴	Farmed wood	25	70
	Sugar beet	40	52
	Sugar cane	24	71
	Waste wood	22	74
	Wheat	70*	16*
	Wheat straw	13	85
Biodiesel (Methyl Ester)	Oilseed rape	52	38
	Palm	68*	19*
	Soy	58*	31*
	Sunflower	41	51
	Tallow (except category 3) ^{55 56}	14	83
Biodiesel (UCO)	Used cooking oil ⁵⁵	14	83
Biodiesel (hydrotreated vegetable oil)	Oilseed rape	44	47
	Palm	62*	26*
	Sunflower	32	62
Biogas	Dry manure	15	82
	Municipal organic waste	23	73
	Wet manure	16	81
FT diesel	Farmed wood	6	93
	Waste wood	4	95

⁵⁴ Renewable fraction only.

⁵⁵ Tallow (except category 3) to biodiesel (ME) and used cooking oil to biodiesel (UCO) are covered under one default value in the RED (as waste vegetable or animal oil biodiesel). This split is intended to provide consistency with the terminology used in previous years of the RTFO, although it should be noted that the same RED default value has been adopted for both fuel chains.

⁵⁶ The RED specifically excludes the use of this default value for category 3 tallow. Note that there is no default provided for tallow category 3 - suppliers must determine whether their tallow is in this category and can only report category 3 tallow if actual data is used for the entire fuel chain or if the fuel is grandfathered. If the tallow is uncategorised (e.g. from outside the EU), the European Commission default value can be used.

Pure plant oil	Oilseed rape	36	57
Methanol, MTBE ⁵⁷	Farmed wood	7	91
	Waste wood	5	94
DME	Farmed wood	7	92
	Waste wood	5	95

Table 5.5 - Process default values

Fuel	Feedstock	Process characteristic	Carbon intensity (gCO ₂ e/MJ)	Carbon saving (%)
Bioethanol, ETBE ⁵⁷ , TAAE ⁵⁷	Corn (produced within the European Community) ⁵⁸	Natural gas as process fuel in CHP plant	43	49
	Wheat	Lignite as process fuel in CHP plant	70*	16*
		Natural gas as process fuel in conventional boiler	55*	34*
		Natural gas as process fuel in CHP plant	44	47
		Straw as process fuel in CHP plant	26	69
Biodiesel (Methyl ester)	Palm	Methane capture at oil mill	37	56
Biodiesel (Hydrotreated vegetable oil)	Palm	Methane capture at oil mill	29	65

What to do if there is no appropriate default value

5.26 There may be certain situations in which an appropriate default value is not available for a consignment of renewable fuel - for example, when a biofuel is produced from a new feedstock (e.g. biodiesel from algae) or a new type of fuel is imported into the UK.

⁵⁷ Renewable fraction only.

⁵⁸ Note that for biofuel derived from corn cultivated within the European Community it must be known that natural gas was used as process fuel in order to use the carbon default. Unlike wheat and palm there is no default available for unknown process.

- 5.27** At the time of publishing this guidance, the European Commission had not specified the process by which default values will be developed for these new fuel chains. In the past, the Renewable Fuels Agency developed default values that suppliers could report. However, this approach is not permitted under the RED and as such the RTFO Administrator will no longer develop default values for new fuels supplied in the UK.
- 5.28** In the absence of a suitable default value, a supplier must calculate the carbon intensity of the fuel from actual data. Alternatively, if the biofuel has been processed in a plant that was in operation on 23 January 2008 (i.e. it is 'grandfathered') the fuel level default value (as shown in Table 5.3) can be reported.
- 5.29** The fuel supplier may wish to inform the European Commission that a new fuel chain is required and should also inform the RTFO Administrator of any requests made to the Commission for new fuel chains. The RTFO Administrator may also pass requests on to the Commission for new fuel chains to be developed.
- 5.30** If a new fuel chain is developed or an existing fuel chain is modified by the Commission the new carbon default must be used as soon as it comes into force as a matter of EU law and applied to all biofuel from that feedstock supplied from that point forwards. Biofuel supplied (and reported in ROS as associated with a month or quarter) before the new default must be reported using the old default. New/amended carbon defaults will be communicated to suppliers by the RTFO Administrator and included in the C&S Guidance.

NUTS2⁵⁹ (Article 19(3))

- 5.31** This article only applies to EU crop based feedstocks. Biofuels made from wastes and non agricultural residues or from crop based feedstocks outside of the EU are exempt.
- 5.32** For EU crop-based feedstocks, parties are only permitted to use the RED GHG default values if the feedstock is from a region where the typical GHG emissions from cultivation of agricultural raw materials can be expected to be lower than or equal to the emissions in the disaggregated default value (a 'compliant NUTS2 region'). Regions are defined at the 'NUTS2' level.
- 5.33** Actual data on cultivation emissions is required in the case that a NUTS2 region has typically higher emissions than those in the default value i.e. a 'non-compliant NUTS2 region' or in the case that the NUTS2 compliance status is unknown. This means that the disaggregated default for

⁵⁹ Nomenclature of territorial units for statistics, level-2:
http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction

cultivation, the feedstock default, or process default (where applicable) cannot be used. However, the disaggregated defaults for processing and transport can still be used (in combination with actual data for cultivation).

- 5.34** Alternatively, if the biofuel is grandfathered then the fuel level default can be reported for non-compliant (or unknown) NUTS2 regions.
- 5.35** For most European feedstocks used in biofuel production, cultivation emissions have been calculated for NUTS2 regions and are included in Member State reports which are published on the European Commission Transparency Platform⁶⁰. These reports identify which regions are 'compliant' and thus where the RED GHG default values may be used, and where they are not.
- 5.36** It is possible for suppliers to use 'regional' cultivation data for NUTS2 regions for which the compliance status has been accepted by the Commission.
- 5.37** Suppliers may use the accepted NUTS2 level cultivation emissions to calculate an actual value regardless of whether they are higher or lower than the disaggregated default published by the Commission for the cultivation stage. Data from these accepted reports is included in the Carbon Calculator. Note that data is not currently available for all biofuel feedstocks for all regions: new data can be used as soon as it is accepted by the Commission and published on the Transparency Platform. Changes to existing NUTS2 data will apply as soon as it is published on the Transparency Platform and applies to any biofuel supplied from that point forwards.

Calculating the biofuel's GHG saving

- 5.38** The direct GHG savings of a biofuel are established by comparing the biofuel's carbon intensity (CI) against the displaced fossil fuel's carbon intensity. This comparison must be done using carbon intensity values given on an energy basis i.e. grams CO₂e/MJ. For all fuels it is assumed the energy efficiency (i.e. kilometres per MJ) of vehicles is the same and, therefore, that one megajoule of biofuel displaces one megajoule of fossil fuel.
- 5.39** The carbon intensity of fossil fuel is defined by the RED. The current value for **all** fossil fuels (e.g. gasoline, diesel, etc) referred to as the fossil fuel comparator is 83.8 gCO₂e/MJ. This value will be updated over time as information on the lifecycle carbon emissions of fossil fuels is reported under the Fuel Quality Directive.

⁶⁰ Member State reports on Emissions from cultivation as required by Article 19(2) are available here: http://ec.europa.eu/energy/renewables/transparency_platform/emissions_en.htm
At present, not all EU NUTS2 regions have a compliance status that is accepted by the Commission.

5.40 The direct GHG saving (as a percentage) is calculated using the following formula:

Calculation of direct biofuel GHG saving

$$\text{GHG saving} = (\text{CI of FF displaced} - \text{CI of biofuel}) / \text{CI of FF displaced} \times 100\%$$

FF is the fossil fuel

CI is the carbon intensity of the fuel

Note that a negative result denotes an increase in GHG emissions.

Example: bioethanol produced from sugar beet replaces petrol

The percentage GHG saving is calculated as follows:

Carbon intensity of biofuel = 40 gCO₂e/MJ

Carbon intensity of gasoline = 83.8 gCO₂e/MJ

$$\text{GHG saving} = (83.8 - 40) / 83.8 \times 100 = 52\%$$

Aggregating consignments with different carbon intensities

- 5.41** Multiple consignments with different carbon intensities can be aggregated at any point in the supply chain provided that:
- The individual consignments have identical 'sets of sustainability characteristics'
 - The rules on aggregation of batches in Chapter 7 are followed. Note that there are specific rules with respect to the greenhouse gas data which must be adhered to.

6. Reporting actual carbon data and assessing the impact of land-use change

Chapter summary

This chapter provides guidance on using actual data to determine the GHG savings of biofuels.

It also outlines how to assess the impact of any changes in land use on the carbon intensity of an administrative consignment of biofuel. The impact of land-use change is not applicable to biofuels derived from wastes and non-agricultural residues.

Calculating a carbon intensity based on actual data

Introduction

- 6.1** Information about activities which take place during the production of a biofuel can be used to calculate its carbon intensity. The information collected could be either:
- Quantitative data about inputs used during the production of a biofuel, for example, that 9,000 MJ of natural gas are used for every tonne of bioethanol produced; or
 - Qualitative data about processes used during the production of a biofuel, for example, that the biofuel plant uses biomass to provide heat and power. This qualitative data also enables the use of selected defaults. These are default values which are either defined by BioGrace⁶¹ or established by the supplier.
- 6.2** This chapter provides detailed information on the process for calculating the carbon intensity of a consignment of biofuel. It can be used by parties who wish to carry out more detailed calculations (and who do not wish to rely upon the high level default values supplied in Chapter 5). It

⁶¹ The RTFO Administrator and the EU [BioGrace project](#) have developed a breakdown of the RED disaggregated defaults into their component input data.

should also be used for feedstocks for which there is no default available in RED Annex V (unless the fuel is grandfathered for which it is permitted to use the fuel level default).

- 6.3** Such calculations can be performed using the Carbon Calculator tool or the accompanying detailed carbon intensity data spreadsheet and carbon intensity templates spreadsheet available [online](#)⁶².
- 6.4** Depending on the nature of the actual data collected about the biofuel production activities, and whether a pre-existing feedstock default is available, it will be necessary to do one or more of the following to determine the biofuel's GHG emissions:
- Edit pre-defined (default) fuel chains;
 - Make adjustments to the structure of existing fuel chains;
 - Construct a new fuel chain.
- 6.5** When emissions from land-use change are greater than zero a calculation of the emissions from land-use change should also be added to the calculated value (note that the previous land use must be determined and unknown land-use change cannot be reported). Details of the required calculations are set out in the sections on Methodology for reporting land-use change emissions.
- 6.6** For partially renewable fuels, the sustainability criteria apply to the renewable part of the fuel. Therefore any GHG calculations apply to the volume of the partially renewable fuel that has been reported as biofuel. For example, if a supplier reports ETBE which contains bioethanol derived from sugar beet, they should report 47% of the total volume of the fuel as 'bioethanol - ETBE' in ROS. Any GHG calculations would apply to the bioethanol component and might include actual data on the cultivation of the sugar beet, processing of the sugar beet into bioethanol and/or transport.

Structure of the default fuel chains

- 6.7** It is important to understand the structure and boundaries of your own fuel chain and how it compares to the default fuel chains before editing or making adjustments to existing fuel chains.
- 6.8** The default fuel chains are constructed by arranging common modules into a series of sequential stages. Figure 6.1 shows the common modules (and their corresponding stages) which make up every fuel chain. Cultivation includes harvesting. These common modules are described in Table 6.1. Figure 6.2 illustrates how they can be arranged

⁶² The [Carbon Calculator](#) and accompanying spreadsheets are official tools supplied by the RTFO Administrator. The Carbon Calculator can also be used to prepare C&S reports which can be uploaded to ROS and submitted (once verified) to the RTFO Administrator to claim certificates.

into a fuel chain.

Figure 6.1 - Modules used to define a biofuel fuel chain

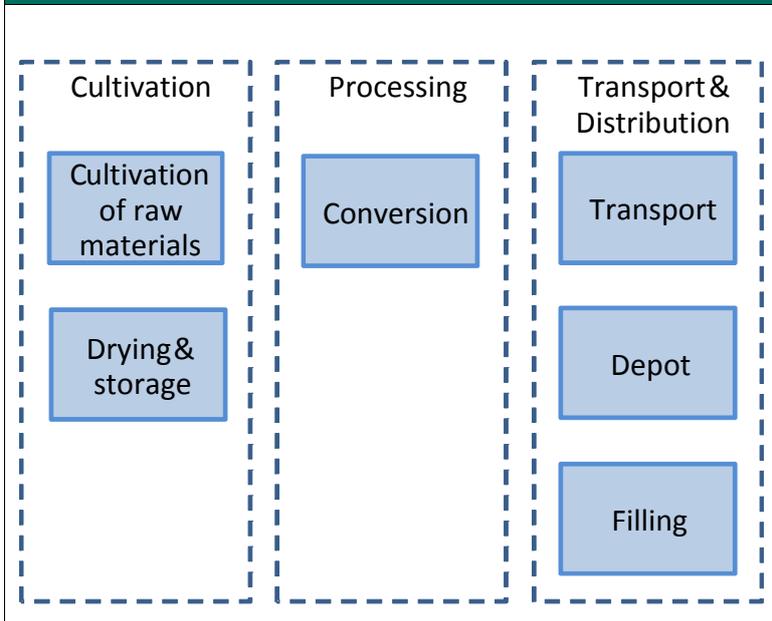


Figure 6.2 - Example fuel chain defined using common modules (OSR = oilseed rape)

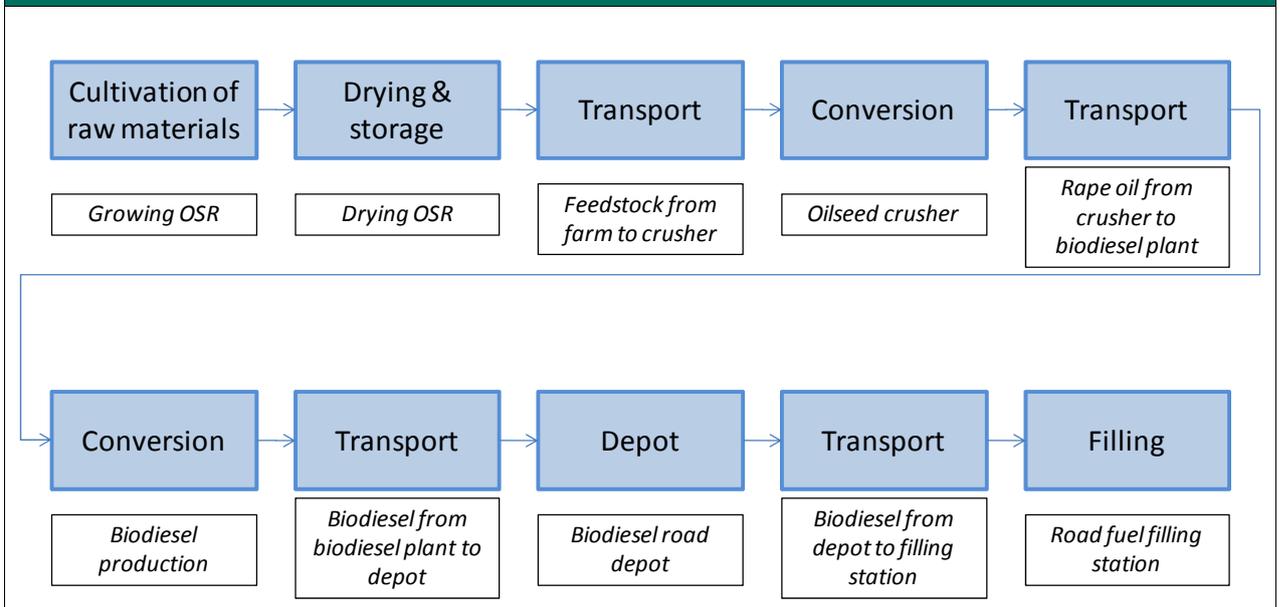


Table 6.1 - Description of the modules constituting a biofuel fuel chain

Module name	Description
Cultivation of raw materials	Growing a biofuel feedstock (e.g. palm, wheat, soy etc).
Drying and storage	Drying and storage of biofuel feedstocks (where this is done outside of a biofuel conversion plant).
Conversion	Any process which changes the physical nature of a feedstock or a biofuel (e.g. oilseed crushing, fermentation etc). The process may also result in the production of co-products (e.g. soy meal).
Transport	Transport of a primary, intermediary or final product (e.g. transport of liquid biofuel from a biofuel conversion plant to a refinery).
Depot	Road fuel depot station.
Filling	Road fuel filling station.

Default input data

6.9 In addition to the high level default values for the fuels, the RTFO Administrator has provided default input data, which can be used in combination with actual data. This data includes standard values (e.g. global warming potentials, lower heating values, transport efficiencies, emission factors), conversion efficiencies, as well as material and energy inputs. This data was used by the Commission in the biofuel carbon intensity calculations in RED Annex V. These default inputs are provided in the 'Detailed carbon intensity' workbook which accompanies this guidance and align with the default inputs published by the BioGrace project⁶³. These should be used in supplier's GHG calculations where they are available. The BioGrace standard values are available on the EU transparency platform.

Focus for data collection

6.10 There is a large amount of data which companies could collect in order to calculate the carbon intensity based on actual data. However, only a small number of data points have a significant influence on the final carbon intensity of a biofuel. Table 6.2 highlights the data points which have the most influence on the final carbon intensity and which should be the focus of data collection efforts. Likewise, these should also be the focus in efforts to reduce the carbon intensity of your biofuel.

6.11 When constructing a new fuel chain, care must be taken to include all sources of emissions likely to contribute one percent or more of the total

⁶³ The RTFO Administrator and the EU [BioGrace project](#) have developed a breakdown of the RED disaggregated defaults into their component input data.

fuel chain carbon emissions⁶⁴. When editing a default fuel chain all significant sources of emission are already included - it is possible to edit parts of the fuel chain and have a mixture of default inputs and actual data (whilst taking into account the compulsory linkages in Table 6.3).

Table 6.2 - Aspects of the biofuel chain which most affect carbon emissions

Step in the supply chain	Focus for data collection/ GHG reduction
Crop production	Agro-chemical application rate (e.g. nitrogen fertiliser) Crop yield and moisture content Fuel consumption for cultivation
Drying and storage	Fuel type (e.g. diesel) or electricity consumption for drying
Feedstock and liquid fuel transport	Transport distances
Conversion - e.g. biofuel conversion or oilseed crushing	Yield ⁶⁵ Fuel type (e.g. natural gas, fuel oil, coal) and demand Electricity demand Chemical inputs Co-product yield and energy content

Rules governing the use of actual data

Life cycle analysis methodology

6.12 The life cycle analysis methodology set out in the RED (described in detail in Part C of Annex V of the RED) must be used for all GHG calculations carried out for reporting under the RTFO. Further guidance on those rules is provided in this guidance which should also be followed.

How much actual data should be included?

⁶⁴ An initial estimate of carbon emissions associated with an input can be calculated using a proxy to work out the likely magnitude of the carbon emissions of a particular input to understand whether it is likely to contribute >1% of the overall lifecycle carbon emissions of the biofuel.

⁶⁵ i.e. tonnes of product (e.g. biodiesel) per tonne of input (e.g. rapeseed oil).

- 6.13** Suppliers should ensure that all sources of GHG emissions which will influence the final carbon intensity of the biofuel by one percent or more are taken into account.
- 6.14** It is not necessary to have actual data for all sources of emissions: for feedstocks which have defaults in Annex V of the RED and which have been replicated in the Carbon Calculator it is possible to use a combination of actual data and default input data⁶⁶ in the GHG calculation (taking into account compulsory linkages - see Table 6.3).
- 6.15** For feedstocks which do not have a carbon default, actual data must be used for the entire fuel chain. For EU crop-based feedstocks actual data for cultivation must be used for non-compliant NUTS2 regions. Exceptions to these two rules apply for 'grandfathered' fuel in which case the fuel level default may be reported (see Chapter 5).
- 6.16** It should only be claimed that 'actual data for cultivation' or 'actual data for entire fuel chain' was used in a C&S report submitted to the RTFO Administrator in ROS where all inputs were based on actual data for the cultivation stage or the entire fuel chain, respectively. This is to enable the RTFO Administrator to use this field to help assess whether a consignment of biofuel meets the RED GHG criteria for feedstocks without a carbon default and for feedstocks from a non-compliant NUTS2 region. In all other situations a mix of actual data and default input data is permitted and therefore does not affect compliance with the GHG criteria.

Compulsory linkages

- 6.17** There are several input fields within a carbon intensity calculation which are interdependent - for example, the yield of many crops is influenced heavily by the amount of nitrogen which has been applied. To avoid the possibility of default values being used in an inappropriate fashion a number of 'compulsory linkages' have been defined - these are listed in Table 6.3.
- 6.18** If actual data is used for one of the two inputs listed in Table 6.3, actual data must also be used for the other input. As with all actual data, the reporting company must have evidence to support this claim.

Table 6.3 - Compulsory linkages for all fuel chains, by module	
Input one	Input two
Crop production	
Crop yield	Nitrogen fertiliser application rate

⁶⁶ See Default input data section below

Nitrogen fertiliser application rate	Soil N ₂ O emissions
Drying and storage	
Moisture removed	Fuel for heating or electricity
Conversion	
Efficiency	Any co-product yield
Efficiency	Fuel or electricity use
Electricity or heat exported	Fuel use

Validity of actual data over time

6.19 The actual data which can be used to edit a default fuel chain does not have to be real-time data (e.g. companies will not be required to assess conversion plant characteristics such as yield and natural gas use at the exact moment that a particular consignment of biofuel is processed). Instead, all actual data in all modules can be based on characteristics averaged over a 12-month period, which should be representative of typical operation.

Actual data for crop production

6.20 It is permissible for evidence in support of actual data provided for crop production to take the form of a statistically accurate survey of farm level data. Such surveys would be considered valid for one crop-growing season and should be based on:

- data specific to an individual field; or,
- average data for all fields of a particular crop grown on a farm (e.g. if a farmer has two fields of wheat, the average crop yield of 11.2 t/ha could be reported, rather than the individual crop yields: Field 1: 20 ha, 200 t; Field 2: 32 ha, 384 t).

6.21 It is also permitted to use regional cultivation data in the place of actual crop production data for calculation of fuel chain GHG emissions. An example of regional cultivation data within the EU is NUTS2 regional cultivation data. Some Member States have calculated regional emissions at the smaller NUTS3 scale. NUTS2 or NUTS3 cultivation emissions data can be used where it has been accepted by the Commission and published on the Transparency Platform⁶⁷.

6.22 It is not appropriate to use data from regions of a larger scale than NUTS2. For non-EU countries regional data may be used from regions of a similar or smaller scale to EU NUTS2 regions.

⁶⁷ Member State's reports are available here:
http://ec.europa.eu/energy/renewables/transparency_platform/emissions_en.htm

- 6.23** Suppliers must use actual cultivation data where they have sourced their feedstock from a NUTS2 region within the EU which has a carbon intensity higher than the RED disaggregated default value ('not NUTS2 compliant'). An exception is permitted where the biofuel is grandfathered - in this case the fuel level default can be reported.
- 6.24** Where NUTS2 data is unavailable or where cultivation data is used for regions smaller than the NUTS2 region the numbers should primarily be based on official statistical data from government bodies when available and of good quality. If not available, statistical data published by independent bodies may be used. As a third option, the numbers may be based on scientifically peer-reviewed work, with the precondition that data used lies within the commonly accepted data range when available.
- 6.25** The data used must be based on the most recent available data from the above-mentioned sources. Typically, the data should be updated over time, unless there is no significant variability of the data over time.

Removal of the conservative factor

- 6.26** Suppliers should be aware that a conservative factor is applied to the default processing step. In the calculation of the disaggregated default values, the European Commission took a conservative approach by applying a multiplier of 1.4 to the processing step, thereby increasing emissions from processing.
- 6.27** If actual data is used for the processing step, it is possible for this conservative multiplier, or factor, to be removed. However, the conservative factor can only be removed from those conversion modules for which actual data is provided for all of the following parameters:
- conversion efficiency,
 - electricity consumption,
 - fuel consumption,
 - chemical inputs,
 - co-product yield.
- 6.28** This rule applies to each conversion module individually in the case that there is more than one.

Default input data

- 6.29** Suppliers should use the values provided in the Detailed carbon intensity spreadsheet in their GHG calculations.

Reporting the type of GHG data

- 6.30** In addition to reporting the carbon intensity of an administrative consignment of biofuel, suppliers must also report whether they used actual data for:
- 1 The cultivation stage;
 - 2 The entire fuel chain.
- 6.31** These should only be reported in the case that the actual data covers **all** emissions that are likely to contribute more than one percent of the anticipated fuel chain GHG emissions. So, for example, where a mix of actual and default data is used in the cultivation module it cannot be claimed that actual data was supplied for the cultivation stage.
- 6.32** Suppliers may calculate the emissions from the cultivation of a biofuel feedstock either by using regional average data (i.e. emissions which have been estimated at a NUTS2 level by Member States or a region smaller than NUTS2) or by using measured data. In this situation it should be claimed that actual data was used for the cultivation stage.
- 6.33** This information will be used to provide an indication of the RED-compliance of a consignment of biofuel with respect to the GHG criteria. This applies in the following situations:
- where feedstock was sourced from a non-compliant NUTS2 region, reporting actual data for cultivation or for the entire fuel chain will be recognised as indicatively RED compliant in ROS. (The biofuel will also need to meet the 35% GHG saving threshold or be grandfathered.)
 - where a new biofuel feedstock or fuel type is supplied (i.e. one that does not have a carbon default in Annex V of the RED) actual data for the entire fuel chain will need to be supplied to demonstrate indicative RED compliance.
- 6.34** If a supplier uses the Carbon Calculator to report actual data to the RTFO Administrator, some selectable options will appear at the bottom of the module data screen where the supplier should provide information about the type of actual data provided. For example, in the cultivation module, the supplier should specify whether NUTS2 regional data or actual cultivation data has been provided. The fuel chain module (the first module in the supply chain) will then automatically show the type of GHG data for the chain that should be reported by the supplier to the RTFO Administrator.
- 6.35** If actual data was provided for all input data in all modules, the supplier can select the option: 'All data reported in all modules are actual data'.

Using qualitative information to calculate a known carbon intensity

- 6.36** This section sets out how to adapt default fuel chains with qualitative information to better represent the carbon intensity of an actual fuel chain.

6.37 A number of selected default options have been defined to enable transport fuel suppliers to use qualitative data to calculate the carbon intensity of their biofuels based on default fuel chains. In practice, this means that the default values for each of a number of fuel chains can be adapted using qualitative information on certain sources of GHG emissions that characterise different ways of producing the biofuel. For example, the mode of transport (truck, ship, rail etc) or the fuel used in a biofuel plant (coal, natural gas, fuel oil etc).

6.38 The input data lying behind these selected default options are being harmonised across the EU through the BioGrace project⁶⁸ and have been published on the Commission's Transparency Platform⁶⁹. Where EU agreed input data is available, it has been incorporated into the detailed carbon intensity spreadsheet. Where it is not available suppliers will have to use data from peer-reviewed scientific literature or use actual data to replace the default input data.

What selected default options are available?

6.39 The following qualitative parameters can be changed by transport biofuel suppliers to calculate the appropriate selected carbon default values (Table 6.4):

- Transport mode (e.g. truck, ship, rail, etc) - this selected default option can be used to calculate emissions from transport of any type of product.
- Type of fuel used to provide heat (e.g. diesel, coal, heavy fuel oil, natural gas, etc) - this selected default option can be used to calculate emissions in the conversion processes.
- Chemicals used in conversion processes

Table 6.4 - Selected default options within each module			
Stage	Module	Input	Options
Cultivation	Crop production	NUTS2 regional cultivation data	For the regions where this is available, the cultivation emissions for the region for a particular feedstock can be included ⁷⁰
Cultivation	Drying and storage	Fuel emissions factor	Diesel, heavy fuel oil, coal, natural gas
Conversion	Conversion	Fuel emissions	Coal, natural gas, heavy fuel oil, biomass,

⁶⁸ www.biograce.net

⁶⁹ http://ec.europa.eu/energy/renewables/transparency_platform/transparency_platform_en.htm

⁷⁰ Selecting the appropriate NUTS2 region in the Carbon Calculator enables the emissions from cultivation for that feedstock from that region to be automatically included.

		factor	lignite
Conversion	Conversion	Chemicals	N-hexane, phosphoric acid, fuller's earth, hydrochloric acid, sodium carbonate, sodium hydroxide, potassium hydroxide, hydrogen, pure CaO, sulphuric acid, ammonia, cyclohexane, lubricants
Transport and distribution	Transport	Transport mode fuel efficiency	Truck (by geographic region), rail (by geographic region), shipping

Use of NUTS2 cultivation emissions as a default option

- 6.40** The cultivation emissions for different NUTS2 (and some NUTS3) regions can be selected as a default in the Carbon Calculator (see the Carbon Calculator *User Manual* for further instructions). See Chapter 5 for rules governing the use of NUTS2 data.
- 6.41** If calculations are performed separately in a spreadsheet, and the regional cultivation emissions are taken directly from Member State country reports, users should take care with the units provided in the country reports. For the purpose of these calculations, users will need the emissions from cultivation as the quantity of GHG emissions per unit of biomass feedstock. However, many country reports provide emissions from cultivation as the quantity of GHG emissions per unit of biofuel. To convert from units of biofuel to units of biomass feedstock, it is necessary to divide by the conversion efficiency of the production of the biofuel from the feedstock (including allocation of any emissions to co-products).
- 6.42** Some Member States' reports do not provide the additional information needed to calculate the emissions per unit of feedstock. In such a case it is not possible to use the NUTS2 level emissions as a selectable default for regional cultivation data (whether using spreadsheets or the Carbon Calculator).

Providing actual data on co-products

- 6.43** The impact of co-products must be taken into account when calculating the carbon intensity of a renewable fuel. The procedure is outlined in Table 6.5. The approach taken depends on the co-product type and, in the case of co-produced electricity, the fuel used to generate the electricity:
- Crop residues (including straw, bagasse, husks, cobs and nut shells) are not taken into account in the carbon intensity calculations⁷¹.

⁷¹ Note that when calculating the GHG emission of crop residues they have zero emissions only up to the point of process of collection.

- Electricity generated in a CHP (combined heat and power/co-generation) plant is taken into account using a system expansion approach where the fuel used is one of the following:
 - a fossil fuel;
 - a biomass fuel which is not a co-product of the fuel chain being analysed; or
 - an agricultural residue which is produced in the fuel chain being analysed.
- For all other co-products, the energy allocation method is used, including electricity generated in a CHP plant fuelled by materials that are not agricultural residues (e.g. DDGS) or are agricultural residues not produced in the fuel chain being analysed.

Example of allocation by energy content

An oilseed rape to biodiesel plant is producing biodiesel and glycerine.

Step 1: Energy content of exported products

Biodiesel: 1 kg of biodiesel has an energy content of 37.2 MJ/kg of biodiesel

Glycerine: 0.11 kg glycerine/kg biodiesel x 16.0 MJ/kg of glycerine = 1.7 MJ/kg of biodiesel

Step 2: Total energy content of products exported from plant

Total energy = 37.2 + 1.7 = 38.9 MJ/kg of biodiesel

Step 3: Divide energy content of a tonne of biofuel by total energy content of products per tonne of biofuel

Allocation factor = 37.2/ 38.9 = 95.7%

Step 4: Multiply upstream emissions and this module's emissions by the allocation factor

Upstream emissions (e.g. production of oilseed rape) = 1,272 kgCO₂e/t biodiesel

Conversion plant emissions = 455 kgCO₂e/t biodiesel

Carbon intensity of biodiesel = (1,272 + 455) x 0.957 = 1,652 kgCO₂e/t biodiesel

Table 6.5 - Procedure for editing a default fuel chain with actual data on co-products

Approach	Description of approach	
System Expansion	Step 1:	Identify the amount of excess electricity being co-generated with the amount of heat used in the module ⁷² .
	Step 2:	Determine the carbon intensity of electricity produced in a power plant burning the same fuel as the co-generation unit (identified in Step 1) by looking up the correct value in the Excel detailed carbon intensity data spreadsheet . If the Carbon Calculator is used, in the 'Conversion' module, in the table named 'Co-products', the user should select from the drop down list in the second column (named 'Use') the electricity from the same fuel as the co-generation unit. See the Carbon Calculator <i>User Manual</i> for further explanation.
	Step 3:	Give the biofuel a credit which is equal to the amount of excess electricity produced (per tonne of biofuel), multiplied by the carbon intensity of the power plant produced electricity (per tonne of electricity). This credit should be negative (i.e. reduces the carbon intensity of the biofuel). This is automatically carried out if using the Carbon Calculator.
Allocation by energy content	Step 1:	If the Carbon Calculator is used, fill out the 'Co-products' table in the 'Conversion' module with the name and yield of the products exported from the conversion plant (other than the main products). The allocation factor is then automatically calculated. Please refer to the Carbon Calculator <i>User Manual</i> for more information. NOTE: For new co-products not specifically named in the Carbon Calculator, users should select 'other' and then insert the yield and energy content of the co-product in the relevant boxes. If an Excel workbook is used, calculate the energy content (in terms of lower heating value ⁷³) of the products exported from the conversion plant - expressed per tonne of the biofuel product. NOTE: Energy contents for existing co-products are provided in the Excel detailed carbon intensity data spreadsheet and should be used unless actual data is available ⁷⁴ .
	Step 2:	Calculate the total energy contained in all products exported from the plant (including the biofuel and the co-products) - expressed per tonne of the biofuel product.
	Step	Divide the energy of a tonne of biofuel product by the total energy of all

⁷² In accounting for that excess electricity, the size of the cogeneration unit shall be assumed to be the minimum necessary for the cogeneration unit to supply the heat that is needed to produce the fuel.

⁷³ The lower heating value should include the entire co-product i.e. not only the dry fraction

⁷⁴ The co-product energy contents are taken from the BioGrace spreadsheet on the EU Transparency Platform and are listed in the excel workbook 'detailed carbon intensity data' that accompanies this guidance. If the required piece of data is not available, suppliers should use peer reviewed literature data or actual data in its place.

	3:	exported products (from Step 2) - this is the allocation factor, the proportion of emissions which should be allocated to the biofuel.
	Step 4:	Multiply the emissions which occurred in this module and all upstream emissions by this allocation factor.

Editing pre-defined (default) fuel chains with actual input data or selected default options

6.44 This section describes how to calculate the carbon intensity of a fuel chain by editing an existing default fuel chain through the use of actual quantitative data and selected default options.

6.45 Actual data can be provided for two types of input data:

- input data to modules (i.e. data on type and amount of product consumed, process yields, etc);
- co-product related data (i.e. data on type and amount of co-product produced, etc).

6.46 For default fuel chains with processing options i.e. wheat to ethanol, palm to FAME biodiesel, palm to hydrotreated vegetable oil (HVO) and palm to co-processed hydrotreated vegetable oil (CHVO), the chain can only be edited if the processing characteristics are known.

6.47 Note that there are two fuel chains (waste animal⁷⁵/vegetable oil and waste wood DME) for which not all the input data is available. If a supplier wishes to include some actual data for these two fuel chains, actual data will also need to be provided for all of the inputs to the modules for which the data is missing⁷⁶.

6.48 Table 6.6 outlines the procedure for editing a default fuel chain. Table 6.5 describes the procedure for editing a fuel chain with actual data on co-products.

Table 6.6 - Procedure for editing a default fuel chain with actual data or selected default option	
Step	Procedure
Step 1:	Select the appropriate default fuel chain to be edited based on the biofuel feedstock type and other characteristics if relevant (e.g. type of fuel used in conversion process). If the Carbon Calculator is used, upload the default fuel chain as explained in the Carbon

⁷⁵ This includes all tallow, except category 3 tallow.

⁷⁶ For waste animal/vegetable oil, the input data that is missing is the data for the conversion module. For waste wood DME, all the input data is missing. This data is missing because neither the RTFO Administrator nor the BioGrace project has managed to calculate the same disaggregated default values as that published by the Commission in the RED, when using the input data the Commission has made available. Until this issue is clarified with the Commission, users will need to provide actual data for all inputs to these modules, if they do not wish to use the aggregated default value for the fuel.

	<p>Calculator User Manual. If the calculations are performed using an Excel workbook, refer to the Excel carbon intensity templates spreadsheet.</p>
Step 2:	<p>Refer to the compulsory linkages sub-section above to establish whether there are compulsory links between the actual data to be used and any other data inputs. If there are such links, actual data must be used for both data inputs.</p>
Step 3:	<p>In the appropriate module within the default fuel chain, complete all the data input fields in the module being edited using the available actual data. If the Carbon Calculator is used, the remaining fields will automatically be filled with default input values. If an Excel workbook is used, complete the remaining fields in the module using default input values obtained from the Excel detailed carbon intensity data spreadsheet.</p> <p>Unless actual data is used for all sources of emissions in a conversion module (fuel, and electricity consumption and input of chemicals and the yield of any co-products produced), the total conversion emissions must be multiplied by a factor of 1.4⁷⁷. This is the factor added to the conversion module of all RED default values to ensure they are conservative in order to reduce the risks of companies reporting carbon intensity values lower than what they are actually achieving. NOTE: Default values for emission factors can also be found in the detailed carbon intensity data excel spreadsheet.</p> <p>NOTE: If the actual data is not a specific data point, but is the carbon intensity of an entire product which is the output of a module (e.g. wheat with 300 kgCO₂e/tonne or rapeseed oil with 850 kgCO₂e/tonne), it is not necessary to fill in the data input fields for the entire module. Instead, the known carbon intensity value should be inserted directly into the 'Fuel Chain Summary' table - see Step 5⁷⁸. This can be done both in the excel spreadsheet and using the generic module in the carbon calculator (please see the Carbon Calculator manual for more information).</p>
Step 4:	<p>If the Carbon Calculator is used, the software automatically calculates the total emissions of the module being edited and the contribution of that module to the overall fuel chain. If an Excel workbook is used, the user has to perform all the required calculations as described in the Excel carbon intensity templates spreadsheet for the relevant module. The numbers and letters used in the formulae are references to specific cells. Calculations should be performed working from the top left, to the bottom right of the module. The total calculated at the bottom of the module represents the total emissions of that module. To calculate the contribution of the module to the overall fuel chain, this total should be divided by all yields of downstream modules and multiplied by all allocation factors of the module being edited and of all downstream modules.</p>
Step 5:	<p>If an Excel workbook is used, the 'Fuel Chain Summary' table (which can be found in the Excel detailed carbon intensity data spreadsheet) should now be updated with the new total for the module being edited: identify the appropriate module in the 'Fuel Chain Summary' table, and replace the associated value with the 'Contribution to overall fuel chain' field from the module which has just been recalculated.</p>
Step 6:	<p>The new fuel chain carbon intensity can be calculated by summing all the rows given in the 'Fuel Chain Summary' table (for the specified process characteristics if relevant) - including the new value for the module which has been recalculated.</p> <p>In the Carbon Calculator, the new fuel chain carbon intensity will appear by clicking on the Fuel Chain module (see the Carbon Calculator <i>User Manual</i> for more information).</p>

⁷⁷ The conservative factor is only removed from those conversion modules for which actual data is provided for all sources of emissions. If there is more than one conversion module, actual data will have to be provided for each conversion module for the conservative multiplier to be removed from all of these conversion modules.

⁷⁸ In this situation, default values for the other upstream stages are not required as these should have already been taken into account in the carbon intensity of the product which has been purchased.

Step 7:	<p>For reporting to the RTFO Administrator, the fuel chain carbon intensity value must be converted to carbon intensity per MJ - using the standard energy content values (lower heating values specified in the Excel detailed carbon intensity data spreadsheet).</p> <p>In the Carbon Calculator, the fuel chain carbon intensity is automatically converted to carbon intensity per MJ - this value can also be read from the Fuel Chain module (see the Carbon Calculator <i>User Manual</i> for more information).</p>
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Making adjustments to the structure of existing fuel chains

6.49 This section describes how the structure of the default fuel chains can be changed as necessary to calculate the GHG emissions of a consignment of biofuel. The RTFO Administrator allows for the structure to be changed in two ways: by removing a module or by adding a module.

Removing a module

6.50 Examples of situations in which suppliers may wish to remove modules include:

- **A certain transport step does not occur.** For example, if the oilseed crushing plant and the biodiesel conversion plant are co-located.
- **Feedstock drying occurs within the biofuel plant.** In this case it is possible to remove the drying and storage module and report the energy consumption for drying and storage within the biofuel conversion module.
- **Oilseed crushing and biodiesel conversion take place within the same plant.** Using one conversion module means energy consumption could be reported for the plant as a whole and would not have to be allocated between crushing and conversion operations.

6.51 Suppliers are required to maintain evidence that the biofuel was produced in the way represented by the revised fuel chain. If modules are removed from the default fuel chain, suppliers will be required to use actual data for data points downstream of this module which may have been affected by the changes made.

6.52 Verifiers should review the entire fuel chain and the data used to ensure there are no inconsistencies. For example, within a biodiesel chain, it would not be possible to claim that oilseed crushing and biodiesel conversion take place within one plant, remove the oilseed crushing conversion module and then rely on default values for the biodiesel conversion module. The conversion module would have to include data specific to the conversion process covered by that module, i.e. include the combined inputs and efficiencies for both the crushing and conversion stages. Any changes to a default fuel chain must be recorded transparently - ideally in a format as close as possible to the

existing default fuel chains (either electronic or paper-based). Verifiers may request access to this information.

6.53 The procedure for removing a module is outlined in Table 6.7.

Table 6.7 - Procedure for removing a module	
Step	Procedure
Step 1:	Select the appropriate default fuel chain to be edited based on the biofuel feedstock type and other characteristics if relevant (e.g. type of fuel used in conversion process). If the Carbon Calculator is used, upload the default fuel chain as explained in the Carbon Calculator <i>User Manual</i> . If the calculations are performed using an Excel workbook, refer to the Excel carbon intensity templates spreadsheet.
Step 2:	Remove the module(s) that is not required.
Step 3:	Adjust the structure of the remaining modules to ensure that the new fuel chain is accurate and complete. Changes may need to be made to e.g.: - Inputs and related units (e.g. for yields and emission totals); - The co-products being exported.
Step 4:	Use actual data in place of single default values for any inputs which might have changed as a result of removing a module.
Step 5:	If an Excel workbook is used, complete all necessary calculations in modules which have been changed - and record changes in the Fuel Chain Summary table. If using the Carbon Calculator, calculations will be performed automatically, provided that the user has correctly reconstructed the chain after deleting the module (as explained in the Carbon Calculator <i>User Manual</i>).
Step 6:	If any yields have been changed, then the contribution to overall fuel chain of all upstream modules will need to be recalculated and recorded in the Fuel Chain Summary table.
Step 7:	If any allocation factors have been changed, then the contribution to overall fuel chain of all upstream modules will need to be recalculated and recorded in the Fuel Chain Summary table.
Step 8:	The new fuel chain carbon intensity can be calculated by summing all the rows given in the Fuel Chain Summary table (excluding the module which has been removed). In the Carbon Calculator, the new fuel chain carbon intensity appears by clicking on the Fuel Chain module (see the Carbon Calculator <i>User Manual</i> for more information).
Step 9:	For reporting to the RTFO Administrator, this value must be converted to carbon intensity per MJ - using the standard energy content values (lower heating values specified in the Excel detailed carbon intensity data spreadsheet). In the Carbon Calculator, the fuel chain carbon intensity is automatically converted to carbon intensity per MJ - this value can also be read from the Fuel Chain module (see the Carbon Calculator <i>User Manual</i> for more information).

Adding a module

6.54 With the exception of crop production, the modules listed in Table 6.1 can be added to an existing default fuel chain. Table 6.2 provides a list of the most important sources of GHG emissions which should be considered within each module. This list is not exhaustive and it is the reporting supplier's responsibility to ensure that all sources of GHG emissions which will influence the final carbon intensity of the biofuel by one percent or more are taken into account.

6.55 Every module must include two totals: the module total (kgCO₂e/t product⁷⁹) and the fuel chain contribution total (kgCO₂e/t biofuel). The Carbon Calculator also shows a running total of emissions up to the end of each module. For example the esterification step in the biodiesel chain will show the running total emissions from the cultivation step up to the end of the esterification step.

6.56 Table 6.8 outlines the procedure for adding a module.

Table 6.8 - Procedure for adding a module	
Step	Procedure
Step 1:	Select the appropriate default fuel chain to be edited based on the biofuel feedstock type and other characteristics if relevant (e.g. type of fuel used in conversion process). If the Carbon Calculator is used, upload the default fuel chain as explained in the Carbon Calculator <i>User Manual</i> . If the calculations are performed using an Excel workbook, refer to the Excel carbon intensity templates spreadsheet.
Step 2:	Add the new module(s) which is (are) required.
Step 3:	Adjust the structure of the remaining modules to ensure that the new fuel chain is accurate and complete. Changes may need to be made to e.g.: - Inputs and related units (e.g. for yields and emission totals); - The co-product being exported.
Step 4:	Actual data will need to be used for all inputs required within the new module - emission factors may be taken from the Excel detailed carbon intensity data spreadsheet. In addition, actual data will be required in place of single default values for any inputs which might have changed as a result of adding the new module.
Step 5:	If an Excel workbook is used, complete all necessary calculations in the modules which have been changed - and record changes in the 'Fuel Chain Summary' table (remembering to add the new module as a new row in the table).

⁷⁹ Whilst yields (i.e. tonne output / tonne input) are not a 'source' of GHG emissions, they are required to enable the fuel chain contribution total to be calculated within existing modules that are upstream of the added module.

	If using the Carbon Calculator, calculations will be performed automatically, provided that the user has correctly reconstructed the chain after adding the module (as explained in the Carbon Calculator <i>User Manual</i>).
Step 6:	If the new module has a 'yield' associated with it and/or if other modules have had their 'yields' altered then the 'contribution to overall fuel chain' of all upstream modules will need to be recalculated and recorded in the 'Fuel Chain Summary' table.
Step 7:	If the new module has an 'allocation factor' associated with it and/or if other modules have had their 'allocation factors' altered then the 'contribution to overall fuel chain' of all upstream modules will need to be recalculated and recorded in the 'Fuel Chain Summary' table.
Step 8:	The new fuel chain carbon intensity can be calculated by summing all the rows given in the 'Fuel Chain Summary' table for the specified feedstock - including the value for the new module which has been added. In the Carbon Calculator, the new fuel chain carbon intensity appears by clicking on the Fuel Chain module (see the Carbon Calculator <i>User Manual</i> for more information).
Step 9:	For reporting to the RTFO Administrator, this value must be converted to carbon intensity per MJ - using the standard energy content values (lower heating values specified in the Excel detailed carbon intensity data spreadsheet). In the Carbon Calculator, the fuel chain carbon intensity is automatically converted to carbon intensity per MJ - this value can also be read from the Fuel Chain module (see the Carbon Calculator <i>User Manual</i> for more information).

Building a new fuel chain

6.57 If a new fuel or feedstock is being introduced to the UK market for which there is no default fuel chain in Annex V of the RED it will be necessary to use actual data to calculate a carbon intensity value. An entirely new fuel chain can be constructed in the Carbon Calculator or in an Excel spreadsheet. However, where an existing default fuel chain is available for the biofuel feedstock it will almost always be easier (and it is recommended) to edit the existing chain.

6.58 The procedure of building a new fuel chain is outlined in Table 6.9.

Table 6.9 - Procedure for building a new fuel chain	
Step	Procedure
Step 1:	Define the steps which occur during the production of a biofuel using the modules shown in Figure 6.1. If the Carbon Calculator is used, upload the appropriate modules and create the link between them as explained in the <i>User Manual</i> .
Step 2:	Identify the main product produced in each module (e.g. wheat, ethanol etc). All emissions within a module must be calculated per tonne of this product.
Step	Within each module, identify all sources of GHG emissions which will influence the final

3:	carbon intensity of the biofuel by one percent or more.
Step 4:	Within each conversion module, identify the co-products produced and decide on the most appropriate treatment based on the rules outlined in Providing actual data on co-products.
Step 5:	Ensure that each conversion module contains yield data (this is needed to establish the contribution that upstream emissions make to the final carbon intensity of a biofuel i.e. for deriving the 'Fuel Chain Summary' table).
Step 6:	Complete a fuel chain structure in the same format which has been used for the default fuel chains as shown in the Excel detailed carbon intensity data spreadsheet and carbon intensity templates spreadsheet - verifiers should review this structure.
Step 7:	Complete the fuel chain structure using actual data and emission factors from the detailed carbon intensity data Excel spreadsheet.
Step 8:	<p>The new fuel chain carbon intensity can be calculated by adding up the contribution of all the different modules.</p> <p>In the Carbon Calculator, the new fuel chain carbon intensity appears by clicking on the Fuel Chain module (see the Carbon Calculator <i>User Manual</i> for more information).</p>
Step 9:	<p>For reporting to the RTFO Administrator, this value must be converted to carbon intensity per MJ - using the standard energy content values (lower heating values specified in the detailed carbon intensity data spreadsheet).</p> <p>In the Carbon Calculator, the fuel chain carbon intensity is automatically converted to carbon intensity per MJ - this value can also be read from the Fuel Chain module (see the Carbon Calculator <i>User Manual</i> for more information).</p>

What to do if no standard value is available

6.59 BioGrace standard values should be used in biofuel GHG calculations where available. Where no standard value is available from BioGrace suppliers should make a request for a value to be published by the Commission⁸⁰. In the absence of the Commission publishing a value, suppliers will have to find these in published literature such as peer reviewed scientific articles. Suppliers should ensure the values used are appropriate for the fuel chain. They will also need to be able to prove that the value they use for their calculations is in line with the following requirements as set out in the RED⁸¹:

- The standard value should be obtained from independent, scientifically expert sources;

⁸⁰ As for new feedstock default carbon intensities, the supplier may make a request to the RTFO Administrator for an emission factor for a particular substance. If the RTFO Administrator receives several requests for the same substance, it will request that the European Commission and/or the JRC publish a new standard emission factor. However, the Commission is also likely to have its own thresholds for deciding that a substance is sufficiently commonly used in a biofuel production process, before publishing an emission factor for it. Therefore, the RTFO Administrator cannot guarantee the timeline in which the European Commission or the JRC will produce a new standard emission factor, if at all.

⁸¹ These criteria are set out in paragraph 83 of the introduction to the RED.

- The standard value should be updated as those sources progress their work.

Methodology for reporting land-use change emissions

Introduction

- 6.60** The sections below set out the rules for GHG emission calculations due to land-use change. The European Commission has published an annotated example of such emissions calculations which can be downloaded from their transparency platform⁸².
- 6.61** Please note that all calculations in this section refer to direct land-use change. There are currently no requirements on fuel suppliers to report, or include in their carbon intensity calculations, emissions from indirect land-use change.
- 6.62** The impact of land-use change is not applicable to biofuels derived from wastes and non-agricultural residues.

Calculation of land-use change emissions

- 6.63** Land-use change related emissions must be calculated based on the difference in carbon stocks of the land between the current and previous land use (on 1 January 2008), as shown in Equation 1.

Equation 1: Land-use change emission

$$e_l = (CS_R - CS_A) \times 3,664 \times (1/20) \times (1/P) - e_B$$

Where:

e_l is the annualised GHG emissions due to land-use change (in gCO₂e/MJ)

CS_R is the carbon stock associated with the reference land use (i.e. the land use in January 2008 or 20 years before the feedstock was obtained, whichever was later) (in gC/ha)

CS_A is the carbon stock associated with the actual land use (in gC/ha). In cases where the carbon stock accumulates over more than one year, the value attributed to CS_A shall be the estimated stock per unit area after 20 years or when the crop reaches maturity, whichever was earlier

⁸²

http://ec.europa.eu/energy/renewables/biofuels/doc/ecofys_report_annotated_example_carbon_stock_calculation.pdf

P is the productivity of the crop (in MJ/ha)

e_B is a bonus of 29 gCO₂e/MJ if the biofuel feedstock is obtained from restored degraded land - see Table 4.1

Calculation of carbon stock

6.64 The calculation of carbon stocks is defined in Commission Decision 2010/335/EU of 10 June 2010 on guidelines for the calculation of land carbon stocks for the purpose of Annex V to Directive 2009/28/EC⁸³

6.65 The key part of the land-use change calculation is an estimation of the change in carbon stocks. This is based on the difference between the carbon stock now and the carbon stock in January 2008 (or 20 years before the feedstock was obtained, whichever is the later date). This is set out in Equation 2.

Equation 2: Carbon stock

$$CS_i = SOC + C_{VEG}$$

Where:

CS_i is the carbon stock of the land

SOC is the soil organic carbon (in gC/ha)

C_{VEG} is the above and below ground vegetation carbon stock (in gC/ha)

6.66 Carbon stock estimates are based on a number of key parameters which should be determined by suppliers:

- Previous land use;
- Climate and in some cases ecological zone;
- Soil type;
- Soil management (for both previous and new land use);
- Soil input (for both previous and new land use).

6.67 Definitions of the different land use categories for determining previous land use are provided in Table 4.1. Climate, ecological zone and soil type can be taken from maps and data provided in the Decision and on the EU Transparency Platform - it will be necessary therefore for

⁸³ This Decision is available online: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:151:0019:0041:EN:PDF>

suppliers to determine the exact location of the land-use change. Soil management (whether full-till, reduced-till or no-till) and soil inputs (low, medium, high-with manure, and high-without manure) are factors that also need to be determined and included in the calculations.

- 6.68** In most cases, it is possible to use the information above to find the values for the different parameters in the look-up tables in Commission Decision 2010/335/EU. However, under certain conditions, actual carbon stock measurements or other calculation methodologies will need to be undertaken e.g. if the soil is a histosol or if no value exists in the look-up tables.
- 6.69** There are two land types (settlements and degraded land) for which the carbon stock has not been defined in the Decision 2010/335/EU. In the absence of specified carbon stock, the RTFO Administrator requires that the carbon stock is measured for any settlement or degraded land converted for biofuel production.

Soil organic carbon - mineral soils

- 6.70** Parties may use several methods to determine soil organic carbon, including measurements⁸⁴. When measurements are not used, the method used shall take into account climate, soil type, land cover, land management and inputs.
- 6.71** As a default method, the following equation can also be used:

Equation 3: Soil organic carbon

$$\text{SOC} = \text{SOC}_{\text{ST}} \times F_{\text{LU}} \times F_{\text{MG}} \times F_{\text{I}}$$

Where:

SOC_{ST} is the standard soil organic carbon in the 0 - 30 cm topsoil layer (in gC/ha)

F_{LU} is the land use factor reflecting the difference in soil organic carbon associated with the type of land use compared to the standard soil organic carbon (no unit)

F_{MG} is the land use factor reflecting the difference in soil organic carbon associated with the principle management practice compared to the standard soil organic carbon (no unit)

F_{I} is the land use factor reflecting the difference in soil organic carbon associated with different levels of carbon input to soil compared to the

⁸⁴ Soil organic carbon levels can traditionally be measured using mass loss on ignition or wet oxidation. However, newer techniques are being developed, which can either be carried out in the field or remotely (near infrared reflectance spectrometry, remote hyperspectral sensing).

standard soil organic carbon (no unit)

6.72 SOC_{ST} can be looked-up in Table 1 of Commission Decision 2010/335/EU⁸⁵ depending on climate region and soil type. The climate region can be determined from the climate region data layers available on the Commission's transparency platform⁸⁵. The soil type can be determined by following the flow diagram on page 12 of the Commission Decision 2010/335/EU⁸³ or following the soil type data layers also available from the transparency platform.

6.73 F_{LU}, F_{MG} and F_I can be looked-up in Tables 2 to 8 of Decision 2010/335/EU⁸³ depending on climate region, land use, land management and input.

Soil organic carbon - organic soils (histosols)

6.74 No default method is available for determining the SOC value of organic soils. The method used by parties should however take into account the entire depth of the organic soil layer as well as climate, land cover, land management and input. Such methods may include measurements.

6.75 Where carbon stock is affected by soil drainage, losses of carbon following drainage shall be taken into account by appropriate methods, potentially based on annual losses of carbon following drainage.

Increase in soil carbon stock through improved agricultural management

6.76 The same methodology used to calculate the change in carbon stocks should be applied for the calculation of emission savings from soil carbon accumulation via improved agricultural practices, such as for example the change from full to no tillage practice. If a supplier does not report a land-use change but wishes the carbon intensity calculation to take into consideration an increase in soil carbon resulting from improved agricultural practices, the same calculations are performed but only F_{MG} and/or F_I will change between CS_R and CS_A.

6.77 Where there has been an increase in carbon stock through improved agricultural management this should be reported in the appropriate field in ROS.

Above and below ground vegetation carbon stock

⁸⁵ The climate region and soil type data layers are available online from <http://eusoils.jrc.ec.europa.eu/projects/RenewableEnergy/>

6.78 For some vegetation types, C_{VEG} can be directly read from Tables 9 to 18 of Commission Decision 2010/335/EU⁸³.

6.79 If a look-up value is not available, vegetation carbon stock shall take into account both above and below ground carbon stock in living stock (C_{BM} in gC/ha) and above and below ground carbon stock in dead organic matter (C_{DOM} in gC/ha). For C_{DOM} the value of 0 may be used, except in the case of forest land (excluding forest plantations) with more than 30% canopy cover. These can be calculated based on the following equations:

Equation 4: Above and below ground carbon stock in living stock

$$C_{BM} = B_{AGB} \times CF_B + B_{BGB} \times CF_B$$

Or

$$C_{BM} = (B_{AGB} \times CF_B) \times (1+R)$$

Where:

B_{AGB} is the weight of above ground living biomass (in kg dry matter/ha)

B_{BGB} is the weight of below ground living biomass (in kg dry matter/ha)

CF_B is the carbon fraction of dry matter in living biomass (in kgC/kg dry matter)

R is the ratio of below ground carbon stock in living biomass to above ground carbon stock in living biomass

Equation 5: Above and below ground carbon stock in dead organic matter

$$C_{DOM} = DOM_{DW} \times CF_{DW} + DOM_{LI} \times CF_{LI}$$

Where:

DOM_{DW} is the weight of dead wood pool (in kg dry matter/ha)

CF_{DW} is the carbon fraction of dry matter in dead wood pool (in kgC/kg dry matter)

DOM_{LI} is the weight of litter (in kg dry matter/ha)

CF_{LI} is the carbon fraction of dry matter in litter (in kgC/kg dry matter)

These values are determined as follows:

B_{AGB} shall be the average weight of the above ground living biomass during the production cycle for cropland, perennial crops and forest plantations

$$CF_B = 0.47$$

B_{BGB} shall be the average weight of the below ground living biomass during the production cycle for cropland, perennial crops and forest plantations

R can be read in Tables 11 to 18 of the Commission Decision 2010/335/EU

$$CF_{DW} = 0.5$$

$$CF_{LI} = 0.4$$

Degraded land bonus

6.80 Biofuel feedstocks cultivated on degraded land will be eligible to receive a GHG bonus of 29 gCO₂e/MJ biofuel. **The Comitology process of the European Commission is currently working on a refined definition of severely degraded and heavily contaminated land. Until further guidance is issued, no biofuel will be eligible to claim the degraded land bonus.** The RTFO Administrator will update this guidance document to include the definition of degraded land before the bonus can be claimed.

6.81 The bonus will apply for a period of ten years from the date of conversion of the land to agricultural use, provided that a steady increase in carbon stocks as well as a sizable reduction in erosion phenomena for severely degraded land (definition (a) in Table 4.1) are ensured and that soil contamination is reduced for heavily contaminated land (definition (b) in Table 4.1).

Providing third party assurance of actual carbon intensities

6.82 Verification of the data reported to the RTFO Administrator is a requirement of the RTFO. If data from an intermediate supplier is being used by multiple reporting parties, the intermediate supplier may consider having their data audited directly, such that they are not subject to verifications from each of the reporting parties.

6.83 For example, a supplier within a reporting party's supply chain may have obtained data on the carbon emissions associated with their oilseed crushing or biofuel conversion plant. This data would be subject to verification: this could be achieved by the reporting party's verifier relying on the opinion of a third party auditor or testing the data directly. From the perspective of the intermediate supplier the latter of these two options may not represent an efficient use of resources as if they supply biofuels with actual carbon data to other reporting parties, potentially the

verifiers for these reporting parties may also need to audit the carbon data, subjecting the supplier to multiple audits.

6.84 If an audit of intermediate data is to be carried out, it is important that the reporting party's verifiers are able to rely on the work of the third party. Suitable indicators of the competency of an auditor to provide assurance over carbon data may include:

- The auditor is accredited to issue annual GHG emission opinions under the EU Emissions Trading Scheme;
- The auditor meets the requirements for organisations that validate or verify GHG emission assertions or claims, as set out in ISO 14065;
- The auditor has experience of issuing public assurance statements on an organisation's GHG emissions in accordance with a recognised assurance methodology standard (e.g. ISAE 3000).

7. Demonstrating compliance with the mass balance rules

Chapter summary

It is necessary to be able to track C&S data back to its original source in order to ensure that it can be verified. This chapter outlines acceptable chain of custody systems and provides guidance on setting up a chain of custody where none exists.

Book and claim systems including equivalence trading are no longer permitted.

General

Guiding principles

- 7.1** The purpose of the chain of custody is to ensure that claims made about products are correct. The RED requires economic operators to put in place systems that are accurate, reliable and protected against fraud, and to get independent verification that their systems meet these requirements.
- 7.2** Verifiers will assess the systems and records of economic operators down the chain of custody. Both economic operators and their verifiers will need to ensure that the systems are applied consistently, are transparent and that no more biofuel is claimed to be sustainable than has been supplied through the chain of custody.

Terminology

- 7.3** Throughout this chapter the following terminology will be used:
- Input: any physical input sourced by any party in the supply chain. For example rapeseed sourced by a rapeseed crusher or rapeseed oil sourced by a biodiesel producer.
 - Output: any physical output supplied by any party in the supply chain. For example rapeseed supplied by a rapeseed farm or rapeseed oil supplied by a rapeseed crusher.

- Conversion factor: refers to the amount of output produced per unit of input. For example, the oil extraction rate or the amount of biodiesel produced per unit of vegetable oil.
- Inventory: refers to a stock of physical product or C&S data.
- Chain of custody: for the purpose of the RTFO *C&S Guidance*, a chain of custody is a system which links the reported volumes of biofuel with certain C&S characteristics to the volumes of feedstocks which possess the same C&S characteristics. An essential aspect of the chain of custody system, therefore, is that it must be able to guarantee that for each unit of biofuel with certain carbon and sustainability characteristics reported to the RTFO Administrator an equivalent amount of feedstock with the same sustainability characteristics has been added to the market.
- Consignment: any amount of product with an identical 'set of sustainability characteristics'. With the exception of carbon in certain instances, all characteristics must be identical. These characteristics are:
 - Fuel type;
 - Biofuel feedstock;
 - Biofuel production process;
 - Country of origin;
 - NUTS2 compliance status or region (for EU feedstocks only);
 - Voluntary scheme(s) (including any supplementary checks where these have been performed);
 - Land-use on 1 January 2008;
 - Whether the plant is 'grandfathered' (see Aggregating multiple consignments below);
 - Carbon intensity (see Aggregating multiple consignments below)

Aggregating multiple consignments

7.4 Multiple consignments can be aggregated at any point in the supply chain provided the individual consignments have identical 'sets of sustainability characteristics' as defined above.

7.5 Consignments with different carbon intensities can be aggregated for reporting purposes if all of the other sustainability data is identical and as long as **aggregation does not enable consignments that would not otherwise have met the minimum GHG emission threshold to do so**⁸⁶.

⁸⁶ Suppliers and verifiers should use the disaggregated defaults as a guideline when assessing whether a consignment is on track to meet the GHG saving threshold at earlier stages of the supply chain. So, in general, GHG savings from a single step or up to a point in the fuel chain combined with defaults for the rest of the fuel chain should meet the GHG threshold if combining with other consignments of biofuel to report a single weighted average carbon intensity.

- 7.6** The overall carbon intensity for aggregated consignments is given by calculating a weighted average (by volume) of all the carbon intensities of the different consignments.
- 7.7** Biofuel produced by an installation that was in operation on 23 January 2008 is considered to be 'grandfathered' and will not have to meet the GHG saving threshold until 1 April 2013. Consignments of grandfathered fuel may be aggregated with non-grandfathered fuel and reported as a single consignment but upon doing so ceases to be considered grandfathered fuel for the purposes of the RTFO. It must therefore be able to demonstrate that it meets the 35% GHG saving threshold in the same way as would any other fuel.
- 7.8** Consignments of biofuel from different NUTS2 regions may be aggregated where they all have the same compliance status. Aggregation is also allowed where there is a mix of different NUTS2 compliance statuses (e.g. compliant, not-compliant or unknown), but then it cannot be claimed that the overall consignment is compliant. Actual data should be supplied where appropriate i.e. for the non-compliant NUTS2 regions unless the biofuel is grandfathered.

Which chain of custody systems are permitted for C&S reporting under the RTFO?

- 7.9** To validate the accuracy of C&S reports a chain of custody must be established from the party which generates the C&S information to the reporting party. In general, three different types of chain of custody systems are distinguished:
- Bulk commodity systems (physical segregation)
 - Mass balance systems (units in = units out)
 - Book and claim systems (tradable certificates)
- 7.10** Mass balance is the only chain of custody system currently permitted under the RED and indeed under the RTFO. Other more stringent chain of custody systems such as bulk commodity systems are permitted because they are consistent with the principles of mass balance - the output is the same as the input.
- 7.11** Book and claim systems are not allowed. This includes GreenPalm RSPO certified palm oil and equivalence trading⁸⁷, both of which were accepted prior to RED implementation.
- 7.12** The European Commission has published a list of voluntary schemes which it recognises as providing evidence of meeting some or all of the

⁸⁷ 'Equivalence trading' is practiced under the Common Agricultural Policy of the EU under which crops grown under contract for energy use can be substituted by other material from within the EU which has not been grown under an energy contract.

sustainability criteria, including chain of custody requirements. The list of schemes is available on the Commission's [Transparency Platform](#) and also on the Department's website. Suppliers will need to check whether the scheme includes an approved chain of custody and whether it covers the entire supply chain, or only a part of it. A supplier must be able to provide proof that its producer sourced the relevant feedstocks through the certified chain of custody.

When to set up a chain of custody

- 7.13** Where no certifiable chain of custody system is in operation, for a part or all of a supply chain, a mass balance approach must be used.
- 7.14** Even where a certified chain is used, there may be limitations of the scheme which will need to be addressed. These include:
- Operators of voluntary schemes may opt to seek European Commission recognition that they meet some, but not all, of the RED criteria. This may mean that there are recognised voluntary schemes that do not include a chain of custody element, or those that do not contain GHG data, for example.
 - The chain of custody under a voluntary scheme may not cover the whole chain from feedstock producer to the reporting party supplying biofuel across the duty point. For example it might only extend from the feedstock producer to the biofuel producer and therefore may not be in place between the biofuel producer and the ultimate supplier who is applying for RTFCs.
- 7.15** These limitations imply that it will be necessary for many suppliers to set up their own chain of custody - at least until existing voluntary schemes develop their own chain of custody systems to cover all feedstocks and to cover the entire fuel chain to the UK duty point. For these situations suppliers are required to operate a reliable mass balance chain of custody system. Guidance on how to do so is provided below.

Guidance for operating a mass balance type of chain of custody

- 7.16** Each party in the biofuel supply chain, which is at any point the legal owner of the product, needs to put in place the administration necessary to maintain the chain of custody. If any party in the supply chain, who takes legal ownership over the product, does not keep the required records, the chain of custody stops at this point and no claims related to C&S data can be made by parties further downstream. The consequence of such a break in the chain of custody is that the fuel supplier will not be able to verify that the fuel meets the sustainability criteria required by the RED and the fuel will therefore not be considered sustainable biofuel for the purposes of the RTFO.

Responsibilities and procedures

7.17 To be able to produce data that is of sufficient quality to apply for an RTFC, fuel suppliers need to ensure that they and others in their supply chain have effective systems to manage the chain of custody and obtain and retain sufficient and appropriate evidence to support their C&S claims. Suppliers should:

- Appoint a person or position with overall responsibility for compliance with the chain of custody procedures;
- Have written procedures or work instructions to ensure implementation of the requirements.

7.18 It is good practice to:

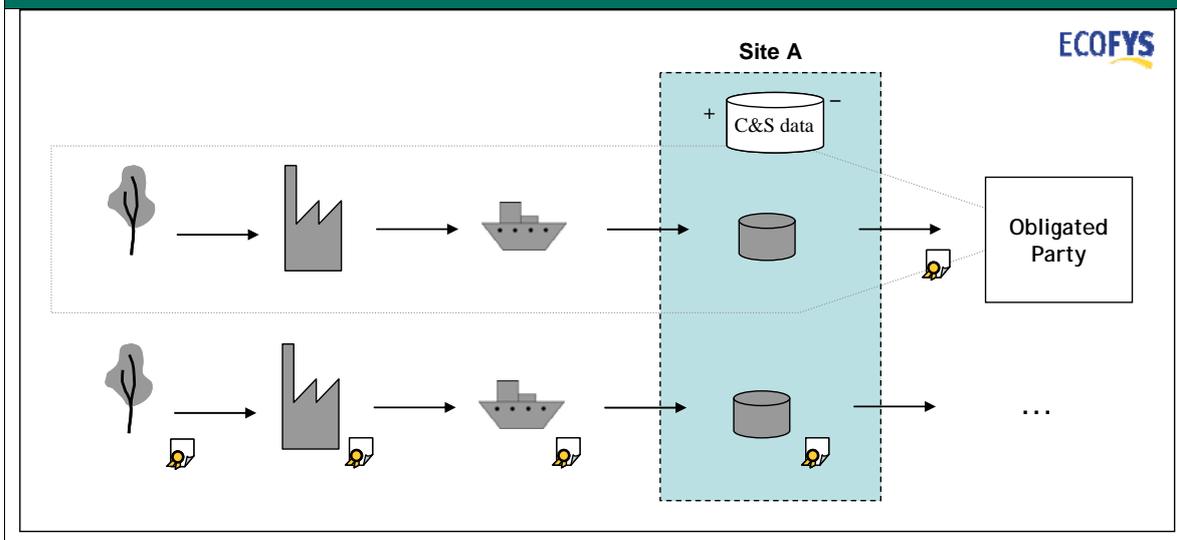
- Liaise with the supply chain to ensure awareness of the need for co-operation and for a chain of custody;
- Produce data in a manner that is transparent and is as consistent as possible between years (allowing for improvements in method);
- Remove unnecessary complexity from the reporting system;
- Organise internal checks of the data;
- Ensure all people supplying data are aware of the rigour required and that responsibility for supplying the data is allocated;
- Map the data flow within the organisation, such as between spreadsheets;
- Minimise the manual transfer of data;
- Ensure adequate controls around the data;
- Document the system;
- Track data over time to help identify any misstatement.

Level at which the mass balance should operate

7.19 The mass balance approach has to be operated at the level of a site that a company owns/operates, or at a more detailed level of granularity (e.g. tank level). The RED does **not** allow companies to operate one single mass balance (units in = units out) approach over more than one geographical location.

7.20 A 'site' is defined as 'one geographical location with precise boundaries within which products can be mixed'. A site is **not** a collection of facilities that are located in different geographical locations, even if that is in the same region. A site can include multiple silos or tanks on the same physical site as illustrated in Figure 7.1.

Figure 7.1 - Example of a transfer of C&S data at a site. The certificate represents the flow of C&S data



Timeframe

- 7.21** It is recommended that parties in the supply chain undertake a periodic inventory of site-level carbon and sustainability data at least on a monthly basis. The periodic inventory of C&S data shall not be negative (i.e. when the periodic inventory is undertaken, parties may not have sold more carbon and sustainability data than they have taken in, nor have more C&S data than they have actual physical feedstock/product). For any transaction, the traded amount of C&S data cannot exceed the traded amount of physical product. At the end of each closing mass balance inventory, the closing balance of C&S data must not be more than the volume of biofuel on the site.
- 7.22** It is acknowledged that due to the way the supply chain currently operates it may be challenging for some parties in the supply chain to conduct a monthly mass balance inventory, particularly at the agricultural end of the supply chain. Therefore the maximum period over which the mass balance has to be achieved under the RTFO can be longer than one month, but must not exceed one year⁸⁸. Note that the one year time period may not to be allowed beyond Year Five of the obligation. In all cases mass balance time periods of reporting parties should not extend across two different obligation periods. For the Year 4 obligation period the mass balance period should not cross the pre-RED and RED periods.
- 7.23** Voluntary schemes will have their own specified balancing up periods. Schemes approved by the Commission are allowable under the RTFO.

⁸⁸ Parties using a voluntary scheme recognised by the European Commission for the mass balance criteria of the RED should use the mass balance timeframe of that voluntary scheme.

7.24 Suppliers should note that verifiers will need to consider the time-frames for balancing up used by suppliers in conducting their assurance processes. Lengthy balancing up periods may hinder the ability of verifiers to confirm whether the sustainability criteria have been met and thus delay the issue of RTFCs.

Record keeping

7.25 It is recommended that each party in the chain of custody keeps the following records that should concur with the information on the invoices, to enable C&S data claims to be traced back through the supply chain.

Input and output records of C&S data

7.26 Input records refer to the C&S data of products purchased from a supplier. Output records refer to the C&S data of products sold to a buyer. For each administrative consignment these records should include at least:

- Invoice reference(s)
- A description of the physical product to which the C&S data refer
- The volume of physical input/output to which the C&S data refer
- The supplying/receiving company
- Transaction date
- Any C&S data

Conversion factor records

7.27 These records refer to the conversion factor of inputs to outputs (e.g. rapeseed to rapeseed oil). Each party in the supply chain can maintain records of its own conversion factors. A party may have more than one conversion factor. If no records are kept for the conversion factor the default value for the respective conversion factor must be used⁸⁹. For each conversion factor it must be clear from the records:

- To which input product it refers
- To which output product it refers
- The units in which the conversion factor is expressed
- The value of the actual conversion factor
- When the specific conversion factor was valid. The period of validity is one year
- The conversion factors may also be integrated in the input, output or inventory records as long as the requirements listed here are met

⁸⁹ Default inputs and standard values can be found in the detailed carbon intensity spreadsheet online.

Periodic inventory of C&S data

7.28 These records provide an insight into the balance of C&S data. Besides helping a company to manage its input-output balance these records also assist in the verification of a party's chain of custody records. It is recommended that the period between inventories is no longer than one month and records should include:

- The inventory of C&S data at the beginning of the respective period (including the carbon intensity of the stock). It must be clearly specified whether this is expressed in input-equivalents (before conversion factor) or output-equivalents (after conversion factor).
- The volumes of inputs with identical C&S data in the respective period. These volumes must coincide with the input records described above.
- The volume of outputs with identical C&S data in the respective period. These volumes must coincide with the output records described above.
- The conversion factor(s) used in the respective period.
- The inventory of C&S data at the end of the respective period (including the carbon intensity of the stock). It must be clearly specified whether this is expressed in input-equivalents (before conversion factor) or output-equivalents (after conversion factor).

7.29 Example formats for the records described above are illustrated in Annex D.

Selling products with C&S data

7.30 Records of commercial transactions should help enable parties in the supply chain, and the verifier appointed by the reporting party, to trace back through the supply chain to verify any C&S claims made.

7.31 It is suggested that a company that sells products with C&S data should specify the C&S data on the invoice or on a document to which the invoice refers. The invoice or relevant document should include the following information:

- The name and address of the buyer;
- The date on which the invoice was issued;
- Description of the product - this must correspond to the description of the product given in the input and output records;
- The quantity of the products sold with specific C&S data. If the invoice contains products with different C&S data, these shall be identified separately in such a way that it is clear to which products the C&S data refers.

- 7.32** Such an invoice or document, sometimes referred to as a 'supplier declaration' does not in itself provide conclusive evidence about the veracity of the information contained, but it does provide evidence which the verifier can use to trace C&S data back up the supply chain.

Allocation of sustainability information

- 7.33** In passing C&S information through the supply chain, it is permitted to use a mass balance system to freely allocate C&S information to outgoing consignments, as long as the 'set of sustainability characteristics' remains together and basic rules of mass balance are respected (i.e. inputs = outputs). The 'set of sustainability characteristics' includes all C&S information known about a consignment, for example: feedstock, origin, voluntary scheme, GHG value etc.
- 7.34** For example, if a party has two consignments in a single tank, one of 'rapeseed methyl ester (RME) from protected cropland' and the other of 'palm methyl ester (PME) from non-protected cropland', individual sustainability characteristics could not be swapped between the consignments. For example, it would not be permitted to assign outgoing data as 'rapeseed methyl ester from non-protected cropland'.
- 7.35** When biofuels are traded, feedstock information can be allocated flexibly to outgoing consignments. In the example above, although the RME and PME were physically mixed, they could be sold to supplier A and supplier B, as 100% RME and 100% PME, respectively. This marks a change from the first three years of the RTFO C&S guidelines where physical consignments of fuel had to be supplied with feedstock data which was representative of the actual feedstock mix of the fuel (so-called 'proportionate feedstock reporting').
- 7.36** For the parts of the supply chain where commodities are traded as single feedstocks, outgoing consignments of feedstock must be sold with feedstock data consistent with that feedstock. For example, if a site contains silos of pure palm oil and pure rapeseed oil, pure palm oil sold as a single feedstock from that site must be sold with palm oil data.
- 7.37** In general, companies should employ a transparent and consistent approach to reporting the proportion of different feedstocks in the fuel that they bring to the market.

Accounting for gains and losses of biofuel volumes

- 7.38** Gains and losses of fuel may occur along the fuel chain, for example, through variation in tolerances of meters and tank gauges, spillages and evaporation, or where residual volumes remain in pipework. Suppliers should endeavour to apply appropriate controls to minimise such gains and losses. Where gains and losses do occur however, C&S data should be adjusted in proportion to the volume of fuel gained/lost at regular

intervals. The Administrator recommends that one month would be an appropriate timeframe to make any adjustments.

Flexible allocation of C&S data over different 'feedstock-derived products'

7.39 Different feedstock-derived products are different products that are produced from the *same feedstock* - e.g. sugar and bioethanol are two different types of products that are both produced from the same feedstock. They are destined for different markets (in this example one for 'food', one for biofuel).

7.40 Producers are allowed to maximise the amount of certified raw material applied to the biofuel product where it and the other feedstock are produced at the same site. It is not allowed to swap data for certified material higher up the supply chain where one of the products is destined for a non-biofuels market. In the same way, it is not allowed to use rape oil data for palm where the rape oil is actually used in a non-biofuel market.

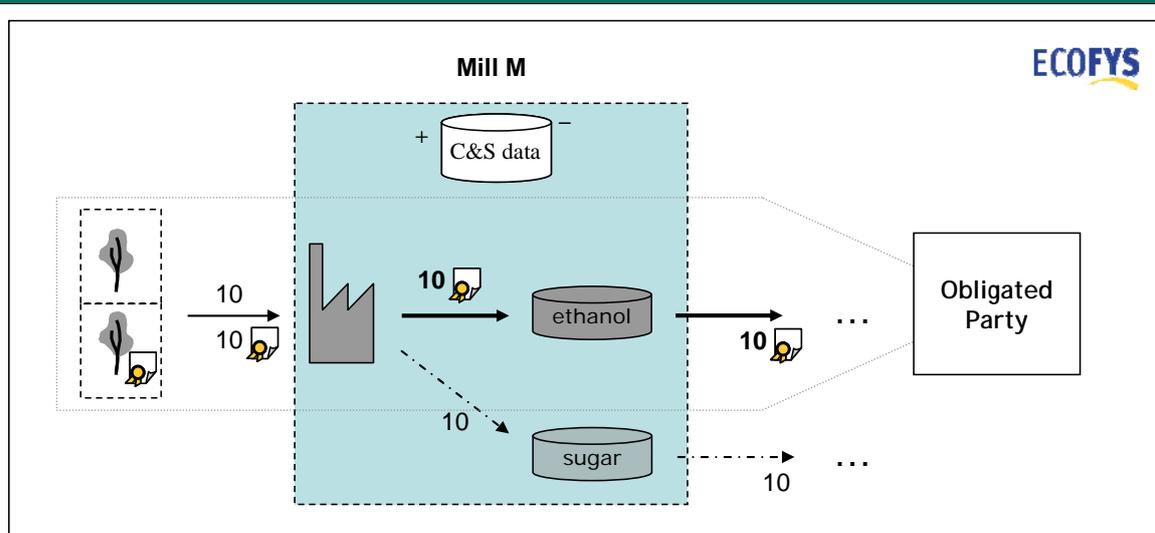
7.41 The following two examples clarify this rule.

Example 1. Flexible allocation of C&S data between sugar and bioethanol produced at the same mill.

7.42 'Mill M' produces and sells sugar cane-derived products (sugar and bioethanol) - Figure 7.2. It produces equal amounts of sugar and bioethanol from sugar cane. Mill M has two dedicated plantations, of which only one meets the RED sustainability criteria. In total, this mill produces twenty units of sugar cane derived products: ten units of sugar and ten units of bioethanol. The obligated party to which M sells its bioethanol wishes to claim that the ten units of sugar cane bioethanol it put on the market all meet the RED sustainability criteria. This is permitted and the obligated party does not have to ensure that the other sugar cane estate, from which Mill M sources the other 10 units of sugar cane, also meets the RED criteria. This is acceptable because, in this example, no more sustainable bioethanol was sold by Mill A than the amount of sustainable sugar cane it sourced and converted into ethanol (taking into account relevant conversion factors).

7.43 The sugar produced by Mill M cannot also be sold with a claim of meeting the RED criteria, as this would be double counting. In addition, it cannot be counted towards the support scheme of any other EEA state, nor towards any other UK renewable energy obligations.

Figure 7.2 - Example of a transfer of C&S data between different feedstock-derived products that is allowed under the RTFO



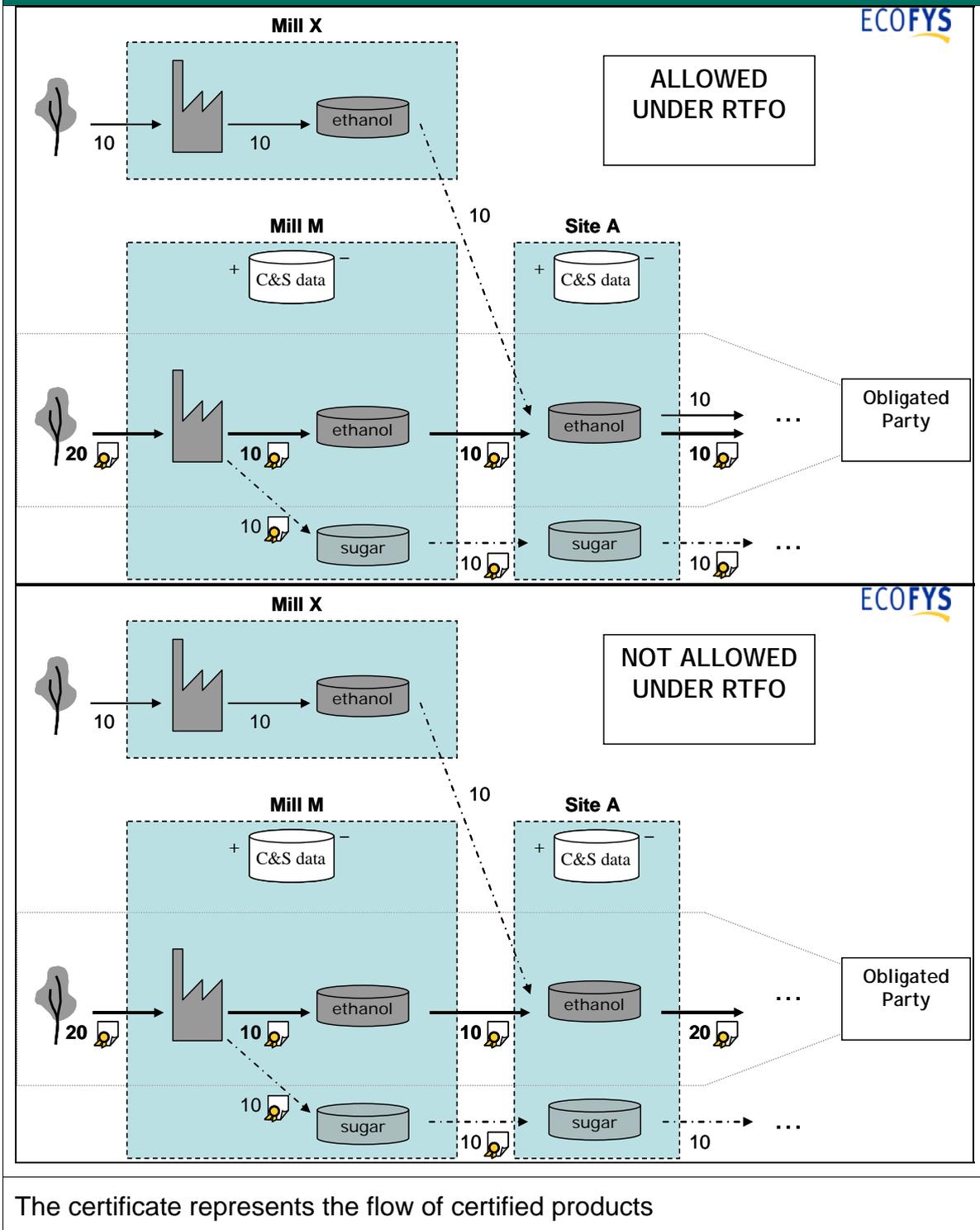
The certificate represents the flow of certified products

Example 2. Allocation of C&S data between sugar and bioethanol produced at different mills.

7.44 Company A ('Site A') stores and trades in sugar cane-derived products (sugar and bioethanol)⁹⁰ - see Figure 7.3. It sources from several sugar cane mills. One of the sugar cane mills ('Mill M') produces equal amounts of sugar and bioethanol from sugar cane. It has a dedicated plantation that meets the RED sustainability criteria. In total, this mill produces twenty units of sustainable sugar cane-derived products (ten units of sugar and ten units of bioethanol). Site A also received ten units of sugar cane bioethanol from another mill (Mill X, that does not meet the RED sustainability criteria). Of the total 20 units of bioethanol that Site A sells to the obligated party, only ten can be claimed to meet the RED sustainable criteria. Site A is not permitted to transfer the sustainability claim of the sugar it sourced from Mill M to the bioethanol it sourced from Mill X otherwise the mass balance would effectively be run over several sites, thereby violating the RTFO requirement that the mass balance is run at the site level. In the same way that sustainability data associated with biodiesel cannot be transferred to bioethanol, it is not possible to transfer the sustainability data that has already been assigned to the sugar at an earlier step in the chain of custody to the ethanol.

⁹⁰ This may be a somewhat contrived situation, but it serves to demonstrate the issue that is relevant here.

Figure 7.3 - Examples of transfers of C&S data between different feedstock-derived products



8. Wastes and residues

Chapter summary

This chapter provides guidance on the categorisation of certain materials as wastes and residues for the purposes of the RTFO and outlines the particular requirements for C&S reporting on biofuels made from these feedstocks. The chapter refers to tables with lists of materials that have been assessed by the Administrator as being either wastes and residues or products. The tables are provided as a separate document on the [DfT website](#) which will be kept updated during the obligation year as materials are added. This chapter provides guidance on what to do if your biofuel feedstock is not listed.

Special measures for wastes and residues

- 8.1** Requirements for biofuels from wastes and residues are different to requirements for biofuels from other feedstocks. Under the RED, biofuels produced from waste, residues, non-food cellulosic material and ligno-cellulosic material can have up to three advantages compared to other biofuels:
- **Double counting** - Article 21(2): Biofuels produced from wastes, residues, non-food cellulosic material, and ligno-cellulosic material shall be considered to 'count twice' for Member States in meeting the ten percent transport target and for economic operators in meeting their obligation in national schemes;
 - **Criteria limited to greenhouse gas (GHG) emissions and mass balance** - Article 17(1): Biofuels produced from waste and residues, other than agricultural, aquaculture, fisheries and forestry residues, need only fulfil the sustainability criteria set out in Article 17(2);
 - **No upstream GHG emissions** - RED Annex V Part C (18): Wastes, agricultural crop residues, and residues from processing shall be considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials.
- 8.2** This is summarised schematically in Table 8.1 below.
- 8.3** What constitutes a waste or a residue for the purposes of the RTFO relies on interpreting the Renewable Energy Directive. This is a complex area.

Table 8.1 Treatment of feedstocks by category

Feedstock category	Advantage		
	Double counting	Criteria limited to GHG and mass balance	No upstream GHG emissions
Products/co-products	✗	✗	✗
Non-food cellulosic material (excluding wastes and residues)	✓	✗	✗
Residues from agriculture, aquaculture, fisheries and forestry ⁹¹	✓	✗	✓
Wastes/residues from processing	✓	✓	✓

Definitions

8.4 The RED does not define wastes or residues. However, the European Commission Communication on its practical implementation (2010/C 160/02) states that wastes and residues should be interpreted in line with the objectives of the RED, specifically:

- For the double counting: diversification of feedstocks;
- For the GHG accounting methodology: no emissions are allocated to co-products which production did not aim for, such as straw in the case of wheat production.

8.5 Because of the need to interpret the term ‘waste’ in line with these objectives, there may be occasions where materials that are determined to be wastes for other legislation, notably the revised Waste Framework Directive (rWFD), will not be wastes for the purposes of the RTFO. It should also be noted that classification as a waste for the purposes of the RTFO in this document does not displace the tests developed under the rWFD for determining whether something is waste for the purposes of that legislation.

8.6 Those handling materials considered waste under the rWFD, such as those who process it, should also have regard to their duty to apply the waste hierarchy when passing it on for further processing or use⁹².

⁹¹ In many cases materials from aquaculture and fisheries will automatically meet the land based criteria because these materials are not usually sourced from the land. However, suppliers should check with the Administrator which criteria must be demonstrated on a case by case basis.

- 8.7** The Commission Communication on Practical Implementation (2010/C 160/02) states that a processing 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'.
- 8.8** The Communication (2010/C 160/02) also notes that 'agriculture, aquaculture, fisheries and forestry residues are residues that are directly produced by agriculture, fisheries, aquaculture and forestry; they do not include residues from related industries or processing'.
- 8.9** Although European Commission Communications are not binding on Member States the RTFO Administrator generally has regard to their guidance.
- 8.10** This guidance on the meaning of residues from agriculture, aquaculture, forestry and fisheries, suggests that such residues are those generated in the process of harvesting the material being sought. Once the product is removed from the point of harvest and processed elsewhere, any residues generated become processing residues.
- 8.11** The 'process of collection' referred to in RED Annex V Part C (18) means the beginning of the process of collection. So in relevant cases the GHG emission calculation will need to include all emissions from transport involved in collecting the waste or residue and transporting it for further processing. For example, used cooking oil may be collected from different restaurants and food processing plants. The GHG emissions from transportation of this used cooking oil will need to be calculated and allocated to the final biofuel.
- 8.12** Products are materials that are not wastes and residues for the purposes of the RTFO. In biofuel applications these will typically be crop based materials but may also be materials that are produced at the same time as other products from a process (a co-product).
- 8.13** There are currently no definitions or guidance from the European Commission for non-food cellulosic material and ligno-cellulosic materials. The RTFO Administrator takes these terms to mean non-food plants and materials such as miscanthus. The Administrator will consider which materials (and as necessary constituent components) qualify for this status on a case by case basis. We will keep under review the need for further work in this area.

Categorisations

⁹² In England and Wales the duty is included in regulation 12 of the Waste (England and Wales) Regulations 2011. Guidance on how to apply the hierarchy and when departures may be justified is at: <http://www.defra.gov.uk/publications/files/pb13530-waste-hierarchy-guidance.pdf>.

- 8.14** In considering the appropriate classification for materials, in addition to the definitions outlined above the RTFO Administrator will take into the account the following considerations:
- Materials that are named as being in a particular category in the RED or Communication, or implicitly categorised through the RED GHG default values, will generally be treated accordingly.
 - For materials not considered in the RED:
 - Products are generally materials that would be attributed GHG emissions for the purpose of calculating GHG default values for Annex V of the Directive. Materials that represent a significant economic value in relation to the main product, and that have other uses than energy applications, are likely to be considered as products.⁹³
 - For the purposes of the RTFO, wastes will generally be materials that are regulated as being wastes under the rWFD, except where they have been intentionally modified to count as waste (e.g. by adding waste to non-waste), or are considered wastes only because they have been consigned to an operation which is a common method of disposing or recovering waste, such as incineration⁹⁴.
- 8.15** The RTFO Administrator will also take into account the treatment of materials by other regulators, Member States, further guidance from the European Commission and any relevant determinations by the courts.
- 8.16** The tables available separately on our website provide guidance as to which substances are considered products, residues or wastes, for the purposes of the RTFO. They list the key materials the RTFO Administrator was aware of that might be used to produce biofuels at the time of publication.
- 8.17** It is not possible to lay down definitive or absolute rules as to when particular substances will be wastes or residues or not. A judgment has to be made taking into account the circumstances of each case. The lists are not exhaustive. There may be further substances that are not included in the tables that may qualify as wastes or residues.
- 8.18** The RTFO Administrator may periodically review and update the tables on the Department's website to add new substances, or if sufficient evidence emerges to indicate that a substance should be treated differently. The treatment of tallow in particular will be kept under consideration and we intend to review it (for April 2013, one full obligation year following implementation) in relation to legislative changes and to

⁹³ The Administrator considers that materials typically trading for around 15% or more of the main product in £/tonne is an indicator of economic significance, but other factors may be taken into account, including the amount of material produced and its other uses.

⁹⁴ Submitting a substance to an operation commonly regarded as a recovery operation (such as incineration for the purposes of energy generation) may indicate that the substance is a waste under the rWFD.

assess the impact on other markets resulting from additional incentives for tallow based biodiesel.

- 8.19** Categorisations of materials will be applicable from the date of the RTFO Administrator's decision and applied to all biofuel from that feedstock supplied from that point forwards. Biofuel supplied (and reported in ROS as associated with a month or quarter) before the new categorisation must report using the old categorisation (e.g. if it was not a waste it would have to meet the land criteria). New categorisations will be communicated to suppliers by the RTFO Administrator and included in the *C&S Guidance*.

Demonstrating that a biofuel or feedstock is a waste or residue

- 8.20** Suppliers may wish to use additional materials not listed here as fuels that may qualify as wastes or residues. The 2011 amendments to the RTFO Order require the supplier to demonstrate to the RTFO Administrator's satisfaction that a biofuel meets GHG emissions saving and land criteria. A verifier's opinion is required to verify this information. This means that suppliers need to demonstrate to the satisfaction of their verifier and the RTFO Administrator that a biofuel supplied under the RTFO is derived from something classified as a waste or residue for RTFO purposes.
- 8.21** One document that might be used as evidence in support of such a claim is likely to be the environmental permit issued to facilities that store or process wastes or evidence of registration under a suitable permit exemption. Other regulatory documentation, such as waste transfer notes, may also provide supporting evidence that a biofuel was derived from waste. The Administrator regards WTNs as one piece of evidence available to help demonstrate the origin of particular materials. However, other aspects, including a robust chain of custody through the supply chain are also key requirements. Independent verifiers must use their professional judgement to assess individual pieces of evidence.
- 8.22** If the material is not listed in the tables you should get in touch with the RTFO Administrator to have the material assessed.
- 8.23** The UK Environment Agency has an important role, under the rWFD, in determining whether a substance is a waste in England and Wales. For the purposes of the RTFO, the categorisation of substances will be determined in line with the objectives of the RED. Because of this, there may be occasions where decisions of the Environment Agency about categorisation of a material under the rWFD will differ from the conclusion as to the status of that material for the purposes of the RTFO. Nonetheless, where the Environment Agency has made a decision that a substance is a waste or is derived from waste, the RTFO Administrator

will generally treat that decision as evidence demonstrating the biofuel is waste or is derived from waste for the purposes of the RTFO Order.

Applying to the RTFO Administrator to have a substance recognised as a waste or residue for the RTFO

- 8.24** Where a supplier wishes to use a feedstock not included in the tables of materials, the operator can apply to the Administrator for a material to be assessed by filling in a form available from the RTFO Administrator. It is the responsibility of suppliers to demonstrate to the RTFO Administrator's satisfaction that substances are wastes or residues.
- 8.25** The RTFO Administrator will ask the supplier to provide information on the processing that results in the substance and its economic value. The RTFO Administrator will consider the evidence provided, and will seek further advice and information, including public consultation, where appropriate. To protect commercial confidentiality, consultation will be limited to unclear cases. In any case, the Administrator will discuss with the applicant what procedure will be followed. The RTFO Administrator will then come to a view on whether the substance is a waste or residue for the purposes of the RTFO.
- 8.26** Once a material has been assessed and a decision made, it will be included in the list of materials in the guidance and all suppliers will be informed. The Administrator expects that most new materials will be assessed within eight weeks.
- 8.27** The RTFO Administrator's view on whether a substance is a residue or a waste is relevant to the RTFO scheme only. The RTFO Administrator's view is not applicable to the status of substances under the Renewables Obligation, nor under the rWFD. This applies both to the tables set out above, and to any subsequent views the RTFO Administrator reaches on wastes and residues for the RTFO.

9. Appointing a verifier

Chapter summary

This chapter provides information on appointing a verifier; the roles and responsibilities of suppliers, verifiers and the RTFO Administrator in respect of this process; and a brief outline of the steps a verifier will undertake.

- 9.1** In order to provide the RTFO Administrator with assurance over the information provided by suppliers the data must be independently verified as a condition of issuing RTFCs. Verifiers will check that the data submitted to the RTFO Administrator meets the requirements of this guidance, and therefore the mandatory sustainability criteria.

Roles and responsibilities

- 9.2** The following paragraphs outline the responsibilities for the key steps in the verification process.

- 9.3** Reporting parties are responsible for:

- Preparing their data and completing their application for RTFCs;
- Preparing their additional sustainability information and submitting it either with their application for RTFCs or in an annual report.
- Ensuring that they have evidence (or that it exists in the chain of custody) to support the information in their application for RTFCs and annual report;
- Appointing an independent verifier who is competent to undertake assurance engagements under ISAE 3000 and has sufficient understanding of the sustainability issues relating to the data they will be reviewing;
- Letting the Administrator know which verifier they have appointed so that they can be given the appropriate access to ROS;
- Indicating which consignments are to be verified in the period in question and submitting the data to the verifier;
- Providing supporting information and evidence to the verifier and hosting any visits;

- Assisting the verifier in gaining contact with and access to other organisations in the supply chain;
- Correcting any data which the verifier finds to be misstated or insufficiently supported by evidence;
- Providing the assurance statement to the RTFO Administrator;
- Informing the RTFO Administrator if errors are discovered in their data after the application for RTFCs or annual report has been submitted.

9.4 Verifiers are responsible for:

- Planning and carrying out evidence gathering and testing activities in order to form an opinion on the data;
- Informing reporting parties of any changes to data which must be made and of any consignments which should be withdrawn from verification;
- Providing an assurance opinion, or, if necessary, a qualified opinion or disclaimer of opinion, in accordance with ISAE 3000 or an equivalent standard, to the reporting party.

9.5 The RTFO Administrator is responsible for:

- Specifying the nature, form and content of the reports to be submitted by reporting parties (as specified in this *C&S Guidance*);
- Receiving the assurance opinions and reviewing against the requirements of this guidance;
- Informing the reporting party of acceptance or rejection of the assurance opinion.

Assurance standards - ISAE 3000

9.6 The RTFO states that the verification must meet the requirements of ISAE 3000 or an equivalent standard.

9.7 ISAE 3000 is an international standard developed by the International Auditing and Assurance Standards Board (IAASB). It is a standard for assurance engagements other than audits or reviews of historical financial information.

9.8 ISAE 3000 defines two levels of assurance: limited and reasonable. The level of assurance required for data submitted under the RTFO is 'limited' as specified in Article 16A of the RTFO Order (as amended).

9.9 The level of assurance relates to the level of engagement risk. This is the risk that the verifier expresses an inappropriate conclusion. As limited assurance involves limited evidence gathering activities, the assurance opinion is expressed in the negative form, for example:

"Based on our review, nothing has come to our attention to cause us to believe there are errors in the data."

- 9.10** By expressing the conclusion in this manner, the verifier is being clear that the level of confidence users of the assurance statement place on the conclusion must be taken in the context of the nature and extent of evidence gathering that the verifier has undertaken and described in the report.
- 9.11** At the time of writing, the RTFO Administrator is not aware of any equivalent standards to ISAE 3000. If a supplier or a verifier wishes to use an alternative standard, they should contact the DfT RTFO Unit (biofuel-sustainability@dft.gsi.gov.uk or 0207 944 8555) to discuss this as soon as possible.
- 9.12** A consultation on changes and updates to ISAE 3000 closed in 2011. When the new version has been released, the RTFO Administrator will review, making changes to this guidance if necessary.

Independence of verifiers

- 9.13** ISAE 3000 requires that *"The practitioner should comply with the requirements of Parts A and B of the Code of Ethics for Professional Accountants, issued by the International Ethics Standards Board for Accountants (the IESBA Code)"*. This Code provides a framework of principles that members of assurance teams, firms and network firms use to identify and safeguard against any threats to independence.
- 9.14** The IESBA code does not of itself preclude a professional accountant within the supplier's organisation (such as an internal auditor) from providing assurance. However, article 16A of the RTFO Order requires that the assurance provider is not the 'supplier', and as such for the purposes of the RTFO, verification by a professional accountant within the supplier's organisation is not considered to be independent assurance.
- 9.15** The RTFO Order also requires that the assurance provider is not a 'connected person' of the supplier. This references the definition in section 1122 of the Corporation Tax Act 2010⁹⁵.
- 9.16** Threats to independence may also exist where a verifier is independent of the supplier, but has been engaged by them in another capacity relating to the carbon and sustainability information. For example, if a verifier has worked with a supplier to design or implement controls over that information.

⁹⁵ <http://www.legislation.gov.uk/ukpga/2010/4/section/1122>

Professional competencies

- 9.17** Article 16A of The RTFO Order requires that the verifier's assurance statement must: "...be produced by a person with appropriate expertise".
- 9.18** ISAE 3000 requires that *"The practitioner should accept (or continue where applicable) an assurance engagement only if the practitioner is satisfied that those persons who are to perform the engagement collectively possess the necessary professional competencies"*. This includes both the work of the practitioner themselves, and any expert that they may engage to assist with the assurance.
- 9.19** Competence to undertake assurance engagements under ISAE 3000 is a requirement for all verifiers under the RTFO.
- 9.20** The extent to which expert skills and knowledge relating to sustainability information for biofuels is required will depend on the complexity of the fuel supply. For example, in the case of a fuel supplier which only supplies biofuel made from locally sourced used cooking oil (UCO), and which reports the default value for the carbon emissions, a significantly lower level of expertise would be needed than for verification of data relating to a supply chain sourcing multiple feedstocks from multiple countries and relying on land use and actual carbon emissions information being accurately passed through the chain of custody.
- 9.21** Suppliers should ask verifiers to demonstrate their competencies as part of the appointment process. In selecting a verifier, suppliers may wish to consider the following guidance. For example, the assurance provider could be required to demonstrate that it:
- Is independent of organisations involved in the production of biofuels;
 - Has established and maintains personnel records which demonstrate that the verification personnel are competent;
 - Has effective procedures for the training and recruitment of competent staff (employees and contractors);
 - Ensures that the personnel involved in verification are competent for the functions they perform including experience of carrying out ISAE 3000 assurance engagements and appropriate experience of the type of sustainability information they will be reviewing;
 - Has systems to monitor the performance of verifiers and reviewers, which are reviewed regularly;
 - Keeps up with verification best practice.
- 9.22** The RTFO Administrator does not provide accreditation of verifiers, it is for the supplier to ensure that the verifier they appoint is suitable.

Preparing for verification

9.23 It is good practice to engage a verifier as early as possible in the process to establish what evidence the verifier will require and to help identify any issues early on.

9.24 Common verification practice is for data to be supplied to the verifier in an organised evidence pack. This would be expected to include:

- A copy of the data in the application for certificates (it is anticipated that this will be able to be provided to the verifier on ROS);
- High-level description of the supply chain;
- All supporting evidence held by the reporting party;
- Field audit reports that the obligated supplier has relied on in formulating their RTFC claim;
- Certifications and supporting assurance opinions held by the reporting party;
- Periodic inventory records for the obligated supplier's mass balance system;
- Calculation spreadsheets (preferably supplied electronically so that verifiers can test the formulae);
- Documented key controls over the reported C&S data;
- Contact details of the organisations in the previous stages in the supply chain (where available).

If this data is not provided in an ordered fashion, the verifier will need to request information, which increases the verification effort required.

9.25 Assurance is to be provided on the supplier's reported data, not the systems and processes used to generate the data. Nonetheless, these controls will be examined, and the greater the confidence that can be placed on them, the less effort that needs to be given to verifying the data for the same level of assurance. Evidence of the effectiveness of controls can come from internal sources, such as management reviews and internal audits, as well as external audits.

9.26 There is no requirement to pass physical evidence (such as copies of invoices etc) from farms, processors or other suppliers along the supply chain. The party which generates the carbon and/or sustainability data can retain this evidence. In verifying the C&S data reported by a fuel supplier, the verifier may expect to work back up the supply chain to the source data using the chain of custody records. The co-operation of those in the supply chain is therefore vital.

9.27 The verifier will use a risk-based approach; therefore, it is unlikely that every organisation in the supply chain will be contacted. The exact approach may vary with each verifier and supply chain.

9.28 It is not necessary to verify information which has already been subject to independent assurance, including that given by voluntary schemes.

- 9.29** If the verifier finds evidence that information has been incorrectly reported, the supplier may amend the data or withdraw the consignments in question from the verification process.

Further guidance on verification

- 9.30** The *RTFO Guidance Part Three: Guidance for Verifiers* adds detail to the information contained in this chapter, and is available [online](#). The additional guidance is aimed at verifiers, though it will also be a useful resource for suppliers preparing for verification.

Annex A Guidance on recognition of voluntary schemes

Annex summary

This annex describes the process for recognition of voluntary schemes to demonstrate RED compliance under the RTFO.

The current list of specific versions of voluntary schemes recognised to demonstrate RED compliance under the RTFO can be found on the DfT website.

Recognition of voluntary schemes by the European Commission

- A.1** The European Commission has undertaken formal assessments of voluntary schemes to judge whether they deem the schemes appropriate to demonstrate compliance with the RED sustainability requirements, including the GHG and land-use criteria (biodiversity, carbon stocks and peatlands), the chain of custody and audit quality requirements. Voluntary schemes are recognised by the European Commission for a specific scope, e.g. certain feedstocks, geographies, one or more of the land-use criteria, the GHG criteria (including the possibility to calculate actual values), and/or the mass balance.
- A.2** Those versions of voluntary schemes that are recognised by the European Commission will automatically be recognised in the RTFO⁹⁶ 20 days after publication in the Official Journal⁹⁷. European Commission-recognised schemes are able to be used under the RTFO to demonstrate compliance with the RED sustainability criteria for which they have received a positive Decision from the Commission.
- A.3** Note that recognition by the European Commission is for specific version(s) of a voluntary scheme listed on the Transparency Platform and on DfT's website. Other versions are not automatically accepted under the RTFO and are not included in ROS.

⁹⁶ It is a requirement of the RED that all Member States recognise any voluntary schemes that are recognised by the European Commission.

⁹⁷ The 20 day timescale is a European Commission legislative norm and not one imposed by the RTFO Administrator.

- A.4** In the case that a European Commission Decision is not consistent with recognition of a version of a voluntary scheme by the RTFO Administrator then the Commission Decision takes precedence.
- A.5** Where the Commission has made a negative assessment of a different (later) version of a voluntary scheme for which the RTFO Administrator had made a positive assessment of a different (earlier) version, the Administrator will consider whether its own assessment still applies. This may involve rebenchmarking the version that the Administrator had previously recognised.
- A.6** The list of European Commission-recognised voluntary schemes including which versions and from when they apply can be found on DfT's website.

Recognition of voluntary schemes by the RTFO Administrator

- A.7** The RTFO Administrator has carried out an initial benchmark of existing voluntary schemes against the mandatory RED biodiversity and carbon stock criteria (see the table of voluntary schemes available online). As these criteria are mandatory, the standards have been scored either a 'Yes' implying a full compliance, or a 'No' implying a non-compliance in these benchmarks. It is not possible to partially comply with a requirement. For full benchmark results, see the [DfT website](#).
- A.8** The RTFO Administrator will recognise the results of these indicative RED benchmarks to demonstrate RED compliance for Year 4⁹⁸ and Year 5 of the RTFO.
- A.9** Note that a number of the schemes benchmarked by the RTFO Administrator have developed supplementary EU versions, or 'RED annexes', in order to be recognised by the European Commission as RED compliant. In these cases the European Commission has recognised the RED version of the scheme, and has not assessed or published a Decision on the previous version of the scheme without the RED annex. The ISCC scheme is one such example of this - the ISCC EU version has been approved by the European Commission, whereas the DE (German) version of the scheme has not been assessed.
- A.10** The RTFO Administrator recommends parties to use the appropriate RED-compliant version of the scheme as soon as it becomes available; however, where it is not yet available suppliers are encouraged to use the original versions of such schemes. Suppliers will need to report the

⁹⁸ Biofuel may have been supplied under the voluntary schemes recognised for RED compliance in the first part of Year 4 prior to RED implementation. Providing that all of the RED sustainability criteria were met (either under the scheme or where there is other evidence to support this), RTFCs issued for these biofuels may be carried forward to Year 5.

version of the scheme they have used when they submit applications for RTFCs,

- A.11** Note the RTFO Administrator benchmarks of standards against the RED were conducted for indicative purposes before all details of the RED and Communications were published and therefore do not guarantee that these voluntary schemes will pass an assessment by the European Commission.
- A.12** In addition the RTFO Administrator indicative benchmarks do not assess whether the voluntary schemes cover greenhouse gas or chain of custody requirements, and the schemes are not assessed against the updated version of the norm for audit quality (see Annex B).
- A.13** The list of RTFO Administrator-recognised voluntary schemes including which versions and from when they apply can be found on DfT's website.

Benchmarking additional voluntary schemes

- A.14** In the interests of EU harmonisation, as a general rule it is expected that further benchmarking of standards against the RED requirements should now be conducted by the European Commission to achieve harmonisation and to minimise administrative burden.
- A.15** The RTFO Administrator will only consider benchmarking individual schemes in exceptional circumstances, where not to do so would hinder the effective administration of the RTFO or would cause significant commercial problems for a significant number of fuel suppliers (e.g. if there were great demand to use the scheme in the UK and significant delays in European Commission assessments). The RTFO Administrator will always recommend to any such scheme that they apply directly to the European Commission for recognition.
- A.16** A company or standard owner may make a request to the RTFO Administrator to benchmark an additional certification scheme, or a new version of a certification scheme that has previously been benchmarked, which the RTFO Administrator will consider. The request should include the following information⁹⁹:
- The formal description of the standard;
 - The most recent version of the standard's criteria and indicators;
 - The most recent version of the standard's procedures and requirements for the auditing/certification process; and

⁹⁹ The RTFO Administrator will give due consideration as to whether a benchmark of the requested standard or certification scheme is appropriate, but is not obliged to conduct a full benchmark. Appropriate standards or certification schemes are likely to be third party sustainability certification schemes that can be used to certify feedstocks of relevance to the biofuels market.

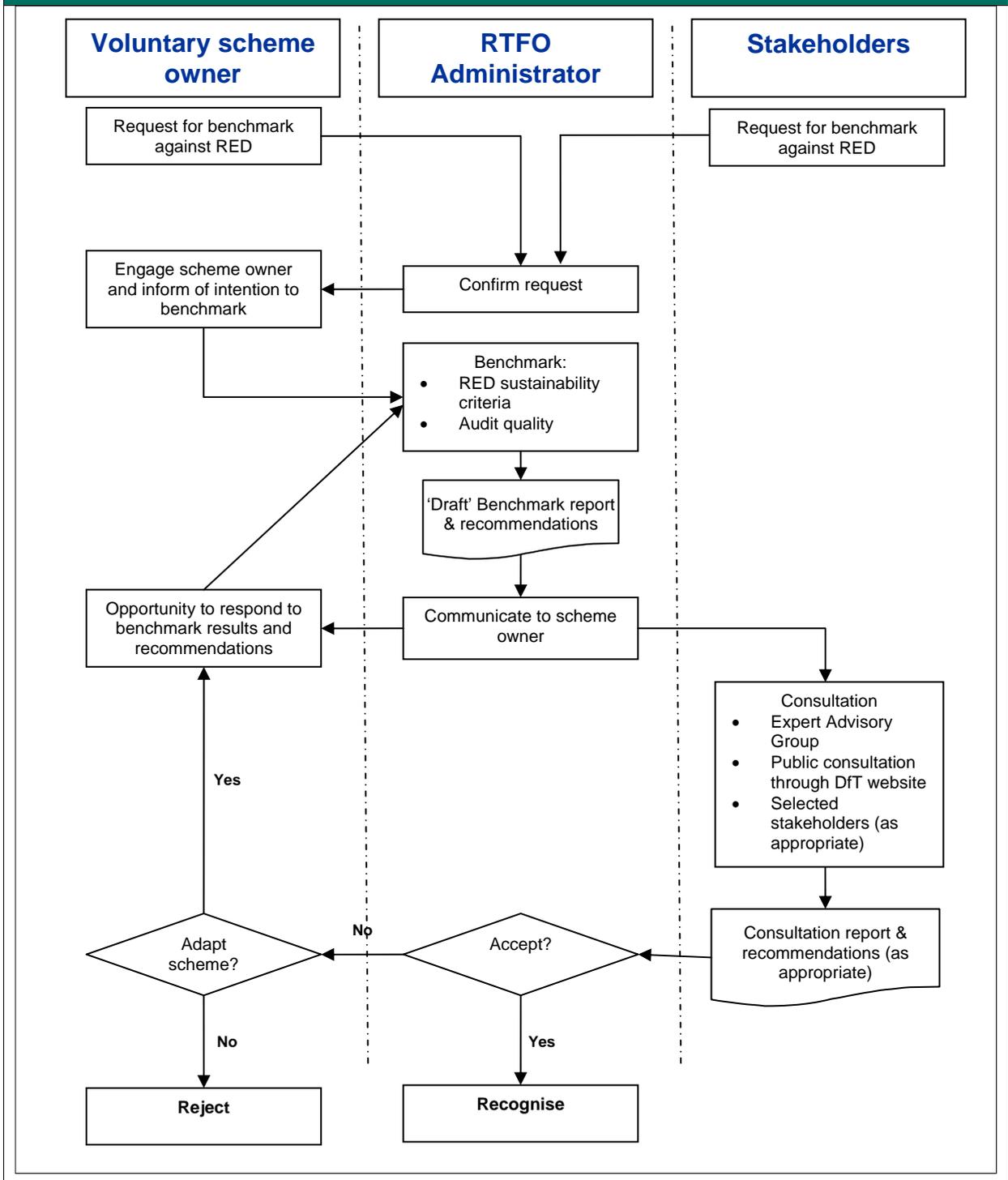
- The most recent version of the standard's accreditation procedures and requirements for certification bodies.
- A.17** The RTFO Administrator will acknowledge the receipt of the request within ten working days. Once a decision has been taken to perform the benchmark an announcement will be published on the DfT website. The RTFO Administrator will then begin the technical review of the certification scheme (i.e. benchmark of sustainability Principles and Criteria, Audit quality etc).
- A.18** An overview of the procedure for benchmarking of additional standards is available in Figure A.1.
- A.19** The RTFO Administrator currently does not intend to benchmark new schemes against the RTFO Biofuel Sustainability Standard.
- A.20** In the interests of consistency in the UK, the RTFO Administrator will engage with Ofgem on voluntary schemes used under the Renewables Obligation sustainability requirements for bioliquids.

Recognition of voluntary schemes by other Member States

- A.21** The RTFO Administrator considers that voluntary schemes should, in most circumstances, be assessed by the European Commission, rather than by Member States: to encourage harmonisation across the EU, the RTFO Administrator recommends that schemes should apply for recognition by the European Commission.
- A.22** Nonetheless it is possible that other EU Member States will assess and accept voluntary schemes that have not been recognised by the European Commission¹⁰⁰. Although the RTFO Administrator recognises that it is in the interest of companies for the same schemes to be approved across the EU, it is feasible that different Member States may have made different assessments of the same scheme and in these circumstances it would be unclear which Member State's assessment should be followed.
- A.23** If the RTFO Administrator has assessed a scheme, this assessment will take precedence under the RTFO over an assessment by another Member State.

¹⁰⁰ If a supplier has biofuel from a voluntary scheme not recognised by the European Commission or the RTFO Administrator, but recognised by another Member State, the supplier must provide evidence of the other Member State's recognition. This may be subject to a further assessment by the RTFO Administrator.

Figure A.1 - Procedure for benchmarking voluntary schemes against the RED by the RTFO Administrator



Procedure for downgrading a decision on a voluntary scheme

A.24 The Administrator may downgrade a previous decision to recognise a voluntary scheme in the following circumstances:

- the European Commission issues a negative decision of a version of a voluntary scheme that was previously recognised by the Administrator or the European Commission;
- the European Commission issues a negative decision/ no longer recognises a different/ later version of a voluntary scheme that the Administrator previously recognised;
- where new information comes to light that results in the RTFO Administrator issuing a negative decision of a version of a scheme that it previously recognised.

A.25 If the European Commission publishes a negative Decision on recognition of a voluntary scheme, where previously they or the Administrator had published a positive Decision then the new Decision will apply 20 days after publication in the Official Journal.

A.26 However if the negative decision by the Commission applies to a different/new version of the scheme the old decision by the Administrator relating to the different/old version of the scheme may be subject to re-assessment.

A.27 If the RTFO Administrator downgrades its own decision on recognition of a voluntary scheme, the old decision may continue to apply for a time period specified by the Administrator e.g. until the end of the current obligation period. This time period will be communicated to suppliers.

A.28 The Administrator will carry out informal consultation with fuel suppliers and stakeholders before taking a decision to downgrade a voluntary scheme (unless that Decision has been made by the Commission), but there is no formal appeals process¹⁰¹.

Recognition of other Member States' national schemes

A.29 Note that all Member States are obliged to put in place a 'national system' for parties to use to demonstrate that their biofuels comply with the RED. This guidance represents the UK's national system for

¹⁰¹ In the event of the RTFO Administrator no longer accepting a particular voluntary scheme version that has not been assessed by the European Commission, it would be open to that scheme to apply for European Commission approval, and if approved it would then be automatically accepted under the RTFO.

biofuels. Reporting parties wishing to apply for RTFCs for biofuels supplied in the UK will have to comply with the requirements of the UK national system by reporting information under the RTFO.

A.30 The UK supports the approach of mutual recognition across Europe. Consignments of biofuel verified as sustainable by other Member States will be treated in the same way as consignments of fuel supplied through voluntary schemes that have been approved by the European Commission.

Annex B RTFO Biofuel Sustainability Standard criteria and indicators

Annex summary

This annex describes the criteria of the RTFO Biofuel Sustainability Standard and the RTFO norm for audit quality. The sustainability criteria and the audit guidelines should be used by suppliers wishing to conduct their own independent field audits of cultivated feedstocks against the RTFO Biofuel Sustainability Standard.

The Standard provides an additional optional tool to demonstrate compliance with the RED land criteria, particularly for use when existing voluntary schemes are not available or operational. It is recommended that, where they are available, suppliers use existing voluntary schemes that have been recognised by the European Commission or by the RTFO Administrator.

- B.1** The RTFO Biofuel Sustainability Standard contains both environmental and social criteria as well as the norm for audit quality. All criteria and indicators (including those of the norm for audit quality) must be met for the RTFO Biofuel Sustainability Standard to be met.
- B.2** The 'recommended' criteria and indicators are not required for the RTFO Biofuel Sustainability Standard to be met, but are considered good practice.
- B.3** The RTFO Administrator will keep the criteria and indicators for the RTFO Biofuel Sustainability Standard under review to ensure their continuing relevance. The status of mandatory and recommended criteria will also be kept under review.

Environmental criteria and indicators

- B.4** The table below shows the environmental sustainability criteria and indicators for the RTFO Biofuel Sustainability Standard. The recommended criteria are also included.

Table B.1 - Environmental criteria and indicators for the RTFO Biofuel Sustainability Standard	
Principle 1: CARBON CONSERVATION	Biomass production will not destroy or damage large above or below ground carbon stocks
Criterion	Indicators
1.1 Preservation of above and below ground carbon stocks (reference date 01/01/2008)	<p>Evidence that biomass production has not caused direct land-use change with a carbon payback time exceeding 10 years.</p> <p>Evidence that the biomass production unit has not been established on soils with a large risk of significant soil stored carbon losses such as forest lands, peatlands, mangroves, wetlands and certain grasslands.</p>
Principle 2: BIODIVERSITY CONSERVATION	Biomass production will not lead to the destruction or damage of high biodiversity areas
Criterion	Indicators
2.1 Compliance with national laws and regulations relevant to biomass production in the area and surroundings where biomass production takes place.	<p>Evidence of compliance with national and local laws and regulations with respect to:</p> <ul style="list-style-type: none"> - Environmental Impact Assessment; - Land ownership and land-use rights; - Forest and plantation management; - Protected and gazetted areas; - Nature and wild life conservation; - Land-use planning; - National rules resulting from the adoption of CBD¹⁰² and CITES¹⁰³. <p>The company should prove that:</p> <ul style="list-style-type: none"> - It is familiar with relevant national and local legislation; - It complies with these legislations; - It remains informed on changes in legislation.
2.2 No conversion of high biodiversity areas after 1 January 2008.	<p>Evidence that production does not take place in gazetted areas.</p> <p>Evidence that production does not take place in areas with one or more HCV areas¹⁰⁴:</p> <ul style="list-style-type: none"> - HCV 1, 2, 3 relating to important ecosystems and species;

¹⁰² <http://www.biodiv.org/com/convention/convention.shtml>

¹⁰³ <http://www.cites.org/eng/disc/text.shtml>

¹⁰⁴ The definition of the 6 High Conservation Values can be found at <http://www.hcvnetwork.org>
Currently no comprehensive maps exist which define HCV areas. For many areas it will therefore still be necessary to assess whether HCVs are present or not.

The following initiatives are helpful in defining areas with one or more HCVs:

Conservation International – Biodiversity Hotspots

Birdlife international – Important Bird Areas

The WWF G200 Eco-regions: the regions classified 'vulnerable' or 'critical/ endangered'.

European High Nature Value Farmland

	<p>- HCV 4, relating to important ecosystem services, especially in vulnerable areas; - HCV 5, 6, relating to community livelihoods and cultural values.</p> <p>Evidence that production does not take place in any areas of high biodiversity.</p> <p>List of protected areas referred to in criterion 2.2:</p> <p>UNESCO World Heritage Sites¹⁰⁵;</p> <p>IUCN List of Protected Areas categories I, II, III and IV¹⁰⁶, according to the list available from 2003¹⁰⁷ or more up to date lists or national data;</p> <p>RAMSAR sites (wetlands under the Convention on Wetlands)¹⁰⁸, according to the available list¹⁰⁹ of more up to date lists or national data.</p>
<p>2.3 The status of rare, threatened or endangered species and high conservation value habitats, if any, that exist in the production site or that could be affected by it, shall be identified and their conservation taken into account in management plans and operations.</p>	<p>Documentation of the status of rare, threatened or endangered species (resident, migratory or otherwise) and high conservation value habitats in and around the production site.</p> <p>Documented and implemented management plan on how to avoid damage to or disturbance of the above mentioned species and habitats.</p>
<p>Recommendation</p>	
<p>2.4 Preservation and/or improvement of surrounding landscape.</p>	<p>Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.</p>
<p>Principle 3: SOIL CONSERVATION</p>	
<p>Criterion</p>	
<p>Biomass production does not lead to soil degradation</p>	
<p>Criterion</p>	<p>Indicators</p>

¹⁰⁵ <http://whc.unesco.org/en/list>

¹⁰⁶ IUCN defines a protected area as: an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means, and subdivides protected areas into six categories: I a) Strict nature reserve/wilderness protection area; I b) Wilderness area; II) National park; III) Natural monument; IV) Habitat/Species management area; V) Protected landscape/seascape; VI) Managed resource protected area. Source: www.wwf.de/fi_leadadmin/fm-wwf/pdf-alt/waelder/WWF-position_Protected_Areas_03.pdf

¹⁰⁷ http://www.unep-wcmc.org/wdpa/unlist/2003_UN_LIST.pdf

¹⁰⁸ <http://www.ramsar.org/>

¹⁰⁹ http://www.ramsar.org/index_list.htm

	<ul style="list-style-type: none"> - Fertiliser; - Irrigation and water usage. <p>The company should prove that:</p> <ul style="list-style-type: none"> - It is familiar with relevant national and local legislation; - It complies with these legislations; - It remains informed on changes in legislation.
4.2 Application of good agricultural practices to reduce water usage and to maintain and improve water quality	<p>Documentation of water management plan aimed at sustainable water use and prevention of water pollution.</p> <p>Annual documentation of applied good agricultural practices with respect to:</p> <ul style="list-style-type: none"> - Efficient water usage; - Responsible use of agro-chemicals; - Waste discharge. <p>Recommendations:</p> <ul style="list-style-type: none"> - Records of annual measurements of: - Agrochemical inputs (input/ha/y), such as fertilisers and pesticides (specified per agrochemical); - Water sources used (litres/ha/y); - BOD level of water on and nearby biomass production and processing.
Principle 5: AIR QUALITY	Biomass production does not lead to air pollution
Criterion	Indicators
5.1 Compliance with national laws and regulations relevant to air emissions and burning practices	<p>Evidence of compliance with national and local laws and regulations with respect to:</p> <ul style="list-style-type: none"> - Environmental Impact Assessment; - Air emissions; - Waste management; - Burning practices. <p>The company should prove that:</p> <ul style="list-style-type: none"> - It is familiar with relevant national and local legislation; - It complies with these legislations; - It remains informed on changes in legislation.
5.2 No burning as part of land clearing or waste disposal	Evidence that no burning occurs as part of land clearing or waste disposal, except in specific situations such as described in the ASEAN guidelines on zero burning or other respected good agricultural practices.

Social criteria and indicators

B.5 Table B.2 illustrates the social criteria and indicators for the RTFO Biofuel Sustainability Standard as well as the recommended criteria.

Table B.2 - Social criteria and indicators for the RTFO Biofuel Sustainability Standard	
Principle 6: WORKERS RIGHTS	Biomass production does not adversely affect workers rights and working relationships
Criteria	Indicators
6.1 Compliance with national law on working conditions and workers rights	Certification applicant must comply with all national law concerning working conditions and workers rights.
6.2 Contracts	Certification applicant must supply all categories of employees (incl. temporary workers) with a legal contract in which the criteria below are registered.
6.3 Provision of information	Certification applicant must show evidence that all workers are informed about their rights (incl. bargaining rights).
6.4 Subcontracting	When labour is contracted or subcontracted to provide services for the certification applicant, the certification applicant must demonstrate that the subcontractor provides its services under the same environmental, social and labour conditions as required for this standard.
6.5 Freedom of association and right to collective bargaining	Certification applicant must guarantee the rights of workers to organise and negotiate their working conditions (as established in ILO conventions 87 and 98). Workers exercising this right must not be discriminated against or suffer repercussions.
6.6 Child labour	Certification applicant must guarantee that no children below the age of 15 are employed. Children are allowed to work on family farms if not interfering with children's educational, moral, social and physical development (the workday, inclusive of school and transport time, to be a maximum of 10 hours).
6.7 Young workers	The work carried out shall not be hazardous or dangerous to the health and safety of young workers (age 15 -17). It shall also not jeopardise their educational, moral, social and physical development.
6.8 Health and safety	All certification applicants must meet basic requirements including potable drinking water, clean latrines or toilets, a clean place to eat, adequate protective equipment and access to adequate and accessible (physically and financially) medical care. Accommodation, where provided, shall be clean, safe, and meet the basic needs of the workers.
	All certification applicants shall ensure that workers have received regular health and safety training appropriate to the work that they perform.
	All certification applicants shall identify and inform workers of hazards, and adopt preventive measures to minimise hazards in the workplace and maintain records of accidents.

<p>6.9 Wages/ compensation</p>	<p>Wageworkers must be paid wages at least equivalent to the legal national minimum wage or the relevant industry standard, whichever is higher.</p> <p>Workers must be paid in cash, or in a form that is convenient to them and regularly.</p> <p>Recommendations:</p> <p>The certification applicant must pay the workers for unproductive time due to conditions beyond their control.</p> <p>Housing and other benefits shall not be deducted from the minimum wage/or relevant industry wage as an in-kind payment without the express permission of the worker concerned.</p> <p>Where the certification applicant uses pay by production (piecework) system, the established pay rate must permit the worker to earn the minimum wage or relevant industry average (whichever is higher) during normal working hours and under normal operating conditions.</p>
<p>6.10 Discrimination</p>	<p>In accordance with ILO Conventions 100 and 111, there must be no discrimination (distinction, exclusion, or preference) practised that denies or impairs equality of opportunity, conditions, or treatment based on individual characteristics and group membership or association like: race, caste, national origin, religion, disability, gender, sexual orientation, union membership, political affiliation, age, marital status, those with HIV/AIDS, seasonal, migrant and temporary workers.</p>
<p>6.11 Forced Labour</p>	<p>Standards shall require that the certification applicant does not engage in or support forced labour including bonded labour as defined by ILO conventions 29 and 105. The company must not retain any part of workers' salary, benefits, property, or documents in order to force workers to remain on the farm. The company must also refrain from any form of physical or psychological measure requiring workers to remain employed on the farm. Spouses and children of contracted workers should not be required to work on the farm.</p>
<p>Recommendation</p>	
<p>6.12 Working hours</p>	<p>Usual working hours shall not exceed eight hours a day and 48 hours a week.</p> <p>Workers must have a minimum of 24 hours rest for every seven day period.</p> <p>Overtime during seasonal peaks is allowed, but needs to be voluntary, and should be paid at a premium rate. Workers should have adequate breaks (every 6 h, 30 minutes). For heavy or dangerous work shorter periods and longer breaks should be allowed.</p>
<p>6.13 Growers and mills should</p>	<p>Current and past prices for produce are publicly available.</p>

deal fairly with smallholders and other local businesses	<p>Pricing mechanisms for produce, inputs and services are documented.</p> <p>Evidence is available that all parties understand the contractual agreements they enter into, and that contracts are fair, legal and transparent and that all costs, fees and levies are explained and agreed in advance.</p> <p>Agreed payments are made in a timely manner.</p>
Principle 7: LAND RIGHTS	Biomass production does not adversely affect existing land rights and community relations
Criteria	Indicators
7.1 Land right issues	The right to use the land can be demonstrated and does not diminish the legal or customary rights of other users and respects important areas for local people.
7.2 Consultation and communication with local stakeholders	Procedures are in place to consult and communicate with local populations and interest groups on plans and activities that may negatively affect the legal or customary rights, property, resources, or livelihoods of local peoples.

RTFO norm for audit quality criteria

- B.6** When auditing a farm or plantation against the environmental and social criteria and indicators of the RTFO Biofuel Sustainability Standard, auditors should meet the following norm for audit quality (see table below). The norm is based on criteria which are each assigned a conformance level of either 'major must' (mandatory) or 'minor must' (recommendation).
- B.7** In addition, when the RTFO Administrator assesses voluntary schemes against RED compliance, the audit requirements of the scheme will be assessed against the norm for audit quality.
- B.8** The norm has been updated to bring it in line with the European Commission 'Communication on voluntary schemes'¹¹⁰: Criterion 2 on management of the audit is upgraded from a 'minor must' to a 'major must'; and criterion 8 on documentation management has been added.

¹¹⁰ Communication on voluntary schemes and default values in the EU biofuels and bioliquids sustainability scheme (COM 2010/C 160/01).

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

Additional field guidance for auditors

B.9 In practice, field audits will almost always find minor non-conformances with standards, which do not normally prevent certification. For certification schemes this is normal practice, including for those voluntary schemes recognised by the RTFO Administrator.

B.10 A definition of minor and major non-conformances is given in the box below. When auditing against the RTFO Biofuel Sustainability Standard, minor non-conformances identified in the field are allowed, and will not prevent a report of 'RTFO Biofuel Sustainability Standard'. If any major non-conformances are found, a producer could not report that that feedstock meets RTFO Biofuel Sustainability Standard requirements.

Minor and major non-conformances

A non-conformance is 'the non fulfilment of a requirement', where a requirement is a 'need or expectation that is stated, generally implied or obligatory' (EN ISO 9000:2005). Most certification bodies (auditors) distinguish findings on the basis of major and minor non-conformances.

A minor non-conformance:

- Is a temporary lapse, or;
- Is unusual/non-systematic, or;
- The impacts of the non-compliance are limited in their temporal and spatial scale;
- And prompt corrective action has been taken to ensure that it will not be repeated;
- And it does not result in a fundamental failure to achieve the objective of the relevant criterion.

A major non-conformance:

- Is repeated or systematic, or;
- Continues for a wide period of time, or;
- Affects a wide area, or;
- Is a non-conformance which is not corrected or adequately responded to by the responsible managers once it is identified, or;
- Results in, or is likely to result in, a fundamental failure to achieve the objectives of the relevant criterion in the Management Unit(s) within the scope of the evaluation.

Note: The definitions for majors and minors above are from the FSC-STD-20-002 V2-1 EN (Structure and Content of Forest Stewardship Standards).

Annex C Known future updates to RTFO C&S reporting

Annex summary

This annex sets out known updates to the RTFO carbon and sustainability reporting scheme that are likely to be required in the future as further information relevant to RED implementation is published.

To help companies prepare, for each aspect we set out the current proposed approach to inclusion in the RTFO C&S reporting scheme.

Updates to the *C&S Guidance* may arise from the Comitology process; or from information published by the European Commission or the RTFO Administrator.

Outcomes of Comitology process

C.1 The following items are awaiting outcomes from the Comitology¹¹¹ process. The timetable of meetings of the 'Committee on the Sustainability of Biofuels and Bioliquids' is not fixed, and the European Commission will call meetings of the Committee as and when items are due for discussion and approval.

Decision on definition of highly biodiverse grassland

C.2 The European Commission is working on a detailed definition of highly biodiverse grassland, relevant to Article 17(3)(c) of the RED. Once published DfT intends to include the definition directly in the RTFO, which will require an update to the RTFO Order and the *C&S Guidance*. Implementation of the definition of highly biodiverse grassland will have the following implications for the RTFO:

- Further detail on the definition of highly biodiverse grassland will enable economic operators to do their own independent audit against the RED biodiversity criteria, in the absence of a voluntary scheme that covers the issue;

¹¹¹ Comitology is the EU Committee system process which oversees the delegated acts implemented by the European Commission.

- The RTFO Administrator will also consider whether it is appropriate to adapt the biodiversity criteria in the RTFO Biofuel Sustainability Standard to be in line with the RED requirements on highly biodiverse grassland. Any changes to the RTFO Biofuel Sustainability Standard would be consulted on in advance by the RTFO Administrator.

Decision on definition of degraded land for bonus

- C.3** The European Commission is working on a detailed definition of degraded land, which is necessary to enable economic operators who cultivate biofuel feedstocks on degraded land to claim a GHG bonus of 29 gCO₂e/MJ.
- Currently degraded land is included as a land-use category in the RTFO, but economic operators are unable to use the category in practice as it is not fully defined. Once published, the definition will be included in this guidance to enable reporting.
 - Economic operators will be able to claim the GHG bonus for production of feedstock on degraded land once the European Commission Decision on the definition of degraded land is published and full RED implementation has taken place.

New or amended Decisions on the recognition of voluntary schemes

- C.4** On an ongoing basis, the European Commission is expected to publish new Decisions, and potentially amended Decisions, relating to the recognition of voluntary schemes. The European Commission will publish these Decisions on the Transparency Platform¹¹². The RTFO Administrator will maintain an updated list of recognised schemes on the [DfT website](#). The process for inclusion of Decisions on voluntary schemes in the RTFO is set out in Annex A.

Information to be published by the European Commission

New or amended GHG default values

- C.5** From time to time the European Commission may publish new or amended GHG biofuel default values. The RTFO Administrator will maintain an updated list of default values in this guidance. The process for inclusion of new or amended default values in the RTFO is set out in Chapter 5.

Amended fossil fuel comparator

¹¹² http://ec.europa.eu/energy/renewables/transparency_platform/transparency_platform_en.htm

- C.6** The Commission may amend the fossil fuel comparator which will also impact on the GHG savings delivered by biofuels. The new comparator will be applied as soon as the Commission publish a report amending the figure under the FQD. We will inform stakeholders accordingly at that time.

'Missing' NUTS2 data for Member State reports not yet approved by Commission

- C.7** Article 19(2) of the RED requires Member States to submit a report, by 31 March 2010, including a list of areas on their territory where GHG emissions from crop cultivation can be expected to be at or below the disaggregated defaults for cultivation, as set out in Annex V, part D. The report is required to describe the method and data used.
- C.8** To date, not all Member States have submitted their reports; furthermore not all of the reports that have been submitted have been approved by the Commission.
- C.9** Once Member State NUTS2 data is approved and published on the European Commission Transparency Platform, the RTFO Administrator will include it in the RTFO including in the Carbon Calculator. New data can be used as soon as it is available whilst changes to existing NUTS2 data will apply from the next obligation period.

Indirect land-use change

- C.10** On 22 December 2010 the European Commission published a report on indirect land-use change related to biofuels and bioliquids. The report acknowledges that indirect land-use change can reduce greenhouse gas emissions savings associated with biofuels, but also identifies a number of uncertainties associated with the available models.
- C.11** The Commission proposes to carry out a detailed assessment of a shortlist of the potential policy approaches for dealing with this issue, which is due to be published in 2011. This will, if appropriate, be accompanied by a legislative proposal for amending the Renewable Energy and Fuel Quality Directives.
- C.12** Including indirect land-use change within the RTFO is likely to require an update to the RTFO Order (depending on the nature of any legislative proposal) as well as an update to the *C&S Guidance*.

Information published by the RTFO Administrator

Additions or amendments to the list of wastes and residues

- C.13** Assessments of which feedstocks count as wastes and residues under the RTFO will be made by the RTFO Administrator. The process for

making additions or amendments to the list of wastes and residues is set out in Chapter 8.

Annex D Example chain of custody records

Annex summary

This annex contains examples of chain of custody records for different economic operators along the supply chain.

Table D.1 - Example of an output record from a farm¹¹³ supplying certified rapeseed to crusher C1

Order no.	Transaction date	Receiving company	Quantity (tonne)	Product	Country of origin	NUTS2 compliant region	Voluntary scheme ¹¹⁴	Land-use on 1 Jan 2008	Crop yield (t/ha)	Nitrogen fertiliser (kg/ha)
22001	15-4-2011	C1	1,000	Rapeseed	UK	Y	Red Tractor	Cropland - non-protected	3.0	180

¹¹³ Note: a farmer (or any other supply chain actor) has the option of passing either raw data or a calculated carbon intensity figure along the chain. In this example the farmer has chosen to provide raw data for crop yield and nitrogen fertiliser application rate – the oilseed crusher must then use default values for the remaining inputs from cultivation for the carbon intensity calculation.

¹¹⁴ It is possible that the biofuel or biofuel feedstock met more than one voluntary scheme.

Table D.2 - Example of an input record from a rapeseed crusher
This crusher takes in certified rapeseed from farm F1 and F2 and non-certified rapeseed from farm F3.

Order no.	Transaction date	Supplying company	Quantity (tonne)	Product	Country of origin	NUTS2 compliant region	Voluntary scheme	Land-use on 1 Jan 2008	Carbon intensity (gCO ₂ e/MJ)
22001	15-4-2011	F1	1,000	Rapeseed	UK	Y	Red Tractor	Cropland - non-protected	29.3
22002	15-4-2011	F2	1,000	Rapeseed	UK	Y	Red Tractor	Cropland - non-protected	29.3
22001	15-4-2011	F3	1,000	Rapeseed	UK	Y	-	Cropland - non-protected	29.3

Table D.3 - Example record of rapeseed crusher conversion factor

Input	Rapeseed
Output	Rapeseed oil
Unit	kg rapeseed oil / kg rapeseed
Value	0.40
Valid from	1-1-2011
Valid until	1-6-2011

Table D.4 - Example of an output record from a crusher

Order number	Transaction date	Receiving company	Quantity (tonne)	Product	Country of origin	NUTS2 compliant region	Voluntary scheme	Land-use on 1 Jan 2008	Carbon intensity (gCO ₂ e/MJ)
23001	20-4-2011	B	400	Rapeseed oil	UK	Y	Red Tractor	Cropland - non-protected	32
23002	20-4-2011	B	400	Rapeseed oil	UK	Y	-	Cropland - non-protected	32

Table D.5 - Example of an input record from a biofuel producer

This producer takes in certified rapeseed oil from crusher C1.

Order number	Transaction date	Supplying company	Quantity (tonne)	Product	Country of origin	NUTS2 compliant region	Voluntary scheme	Land-use on 1 Jan 2008	Carbon intensity (g CO ₂ e/ tonne)
23001	20-4-2011	C1	400	Rapeseed oil	UK	Y	Red Tractor	Cropland - non-protected	32
23002	20-4-2011	C1	400	Rapeseed oil	UK	Y	-	Cropland - non-protected	32

Table D.6 - Example of an inventory record of C&S data for crusher C1

Product	Country of origin	NUTS2 compliant region	Voluntary scheme	Land-use on 1 Jan 2008	Carbon intensity (gCO ₂ e/MJ)	Inventory (tonne) 15 Apr 2008	Input (tonne)	Output (tonne)	Inventory (tonne) 15 May 2008
OSR	UK	Y	Red Tractor	Cropland - non-protected	32	1,000	800	400	1,400
OSR	Romania	N	-	Cropland - non-protected	32	2,000	0	0	2,000
OSR	UK	Y	-	Cropland - non-protected	32	0	400	400	0

Table D.7 - Example of an input record from biofuel company B

Order number	Transaction date	Supplying company	Quantity (tonne)	Product	Country of origin	NUTS2 compliant region	Voluntary scheme	Land-use on 1 Jan 2008	Carbon intensity (gCO ₂ e/MJ)
22001	20-4-2011	C1	1,200	Rapeseed oil	UK	Y	Red Tractor	Cropland - non-protected	42.5
22002	20-4-2011	C1	4,800	Rapeseed oil	Unknown	Unknown	-	Unknown	42.5
22005	20-4-2011	C2	400	CPO	Malaysia	N/A	RSPO	Cropland - non-protected	42.5
22006	20-4-2011	C2	600	CPO	Malaysia	N/A	-	Unknown	42.5

Table D.8 - Example of an output record from bio fuel company B

Order no.	Transaction period	Receiving company	Quantity (tonne)	Fuel type	Feedstock	Biofuel production process	Country of origin	NUTS2 compliant region	Voluntary scheme	Land-use on 1 Jan 2008	Carbon intensity (gCO ₂ e/MJ)	Plant in operation on 23 Jan 2008?
33001	4-2011	X	300	Biodiesel	Rapeseed oil	-	UK	Y	Red Tractor	Cropland - non-protected	52	Yes
33002	4-2011	X	1,400	Biodiesel	Rapeseed oil	-	Unknown	Unknown	-	Unknown	52	Yes

Table D.9 - Example of an input record from oil major X**Oil major X receives 2,000 tonnes biodiesel from biodiesel producer B, of which 400 tonnes report a voluntary scheme**

Order number	Transaction period	Supplying company	Quantity (tonne)	Fuel type	Feedstock	Biofuel production process	Country of origin	NUTS2 compliant region	Voluntary scheme	Land-use on 1 Jan 2008	Carbon intensity (g CO ₂ e / tonne)	Plant in operation on 23 Jan 2008?
33001	4-2011	B	300	Biodiesel	Rapeseed oil	-	UK	Y	Red Tractor	Cropland - non-protected	52	Yes
33002	4-2011	B	1,400	Biodiesel	Rapeseed oil	-	Unknown	Unknown	-	Unknown	52	Yes
33005	4-2011	B	100	Biodiesel	CPO	No methane capture	Malaysia	N/A	RSPO	Cropland - non-protected	68	Yes
33006	4-2011	B	200	Biodiesel	CPO	Unknown	Unknown	N/A	-	Unknown	68	Yes

Annex E Glossary

Account holder	An organisation holding an account with the RTFO Administrator, allowing them to be issued with or trade RTFCs
Actuals	Shorthand for actual carbon values
Administrative consignment	An administrative batch of fuel. Any amount of biofuel that has a consistent set of sustainability characteristics.
Biofuel	Fuel made from recently-living biological material.
Biodiversity	Measurement of the variety of different life forms in a given area. High biodiversity is viewed as an indication of a healthy ecosystem.
Carbon defaults	Default carbon intensity values provided by the Commission.
Carbon intensity	The rate at which carbon is emitted in relation to the amount of energy produced.
Carbon stock	Measurement of the carbon stored in a given area of land which can go up or down depending on the use of that land. Forests and peatland are examples of land with high carbon stocks.
C&S	Carbon and sustainability
Certificates	Shorthand for RTFCs
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent
Comitology	The EU Committee system process which oversees the delegated acts implemented by the European Commission.
Commission	The European Commission
DDGS	Dried distillers grains and solubles.

<i>De minimis</i>	Threshold applied to the volume of fuel supplied by a company which determines whether or not it is obligated to supply biofuel under the RTFO (see <i>obligated suppliers</i> below).
DECC	Department for Energy and Climate Change
Defaults	Shorthand for default carbon values (see carbon defaults above).
Input data	Any information about the biofuel production chain which is used to calculate the carbon intensity of the biofuel, for example yield, nitrogen fertiliser inputs, quantity of fuel used in production plant.
Defra	Department for Environment Food and Rural Affairs
DfT	Department for Transport
Economic operator	Any company or organisation involved in the fuel supply chain
EU	European Union
ETBE	Ethyl-tertiary-butyl-ether. A type of biofuel
FAME	Fatty-acid-methyl-ester. A type of biofuel
Feedstock	Raw material used to produce biofuels
FQD	Fuel Quality Directive
gCO₂e/MJ	Unit of measurement of carbon intensity
GHG	Greenhouse gas
Grandfathering	Allowing fuels produced at installations operational before a certain date to automatically meet minimum GHG savings thresholds. An industry concession designed to avoid disadvantaging those who have already invested in infrastructure.
ha	Hectare
HMRC	Her Majesty's Revenue and Customs
HVO	Hydrotreated vegetable oil. A type of biofuel.
Installation	A processing plant which lead to a material

	modification from any of the relevant feedstock to the finished fuel. It does not include installations solely used for the collection, transportation or storage of the feedstocks.
ILUC	Indirect land-use change. Land-use change (see below) where the cause is at least a step removed from the effect. In the context of this document, it can be taken to mean the knock-on effects on land use resulting from the cultivation of biofuel feedstocks. It is acknowledged to be more difficult to manage or monitor than direct land-use change.
ISO	International Organisation for Standardisation
ISAE	International Standard on Assurance Engagements
Land-use change	The outcome when a particular activity, such as cultivation of biofuel feedstock, results in a change of land use. Generally refers to previously uncultivated land such as forest, peatland or grassland being used for agriculture.
LCA	Lifecycle analysis
MSW	Municipal solid waste. A feedstock
MTBE	Methyl-tertiary-butyl-ether. A type of biofuel
NDPB	Non-Departmental Public Body
NUTS/NUTS2	Nomenclature of Territorial Units for Statistics, a method of defining regions within European countries employed by the European Commission. NUTS2 refers to the second level on the scale and divides the EU into 271 regions
NUTS2 compliance	Refers to whether the emissions from cultivation for a particular biofuel feedstock are greater than (NUTS2 non-compliant) or equal to/less than (NUTS2 compliant) the disaggregated default for cultivation.
Obligated supplier	A transport fuel supplier upon whom a renewable transport fuel obligation is imposed.
OSR	Oilseed rape. A feedstock
PPO	Pure plant oil. A type of biofuel

POME	Palm oil mill effluent. An effluent from palm oil processing which can be captured and treated to prevent methane emissions
RED	Renewable Energy Directive
Renewable fuel	A fuel from a source that is either inexhaustible or can be indefinitely replenished at the rate at which it is used. For the purposes of this document, it generally means biofuels (see above).
Reporting party	A fuel supplier reporting to the RTFO Administrator.
RFA	Renewable Fuels Agency. An NDPB that administered the RTFO prior to its abolition in April 2011.
RO	Renewables Obligation.
ROS	RTFO operating system.
RTFC	Renewable transport fuel certificate.
RTFO	Renewable Transport Fuel Obligation. The statutory instrument used to implement the transport elements of the RED.
RTFO Biofuel Sustainability Standard	Set of criteria against which biofuel feedstock production may be audited. Developed from the RTFO Meta Standard.
Selected default	For some inputs to biofuel production, the user may select from a list of qualitative options (or selected defaults). For example, they could choose between using biomass or natural gas to provide heat and power. These qualitative options have different default emissions associated with them.
Standard value	Data which is not dependent on the biofuel production chain being considered. For example, lower heating values, emissions factors for materials or global warming potentials.
Supplier	Any company or organisation supplying fuel or its precursors e.g. for biofuel this would include the crop and the virgin oil.
UCO	Used cooking oil. A feedstock.

Verifier	The person who undertakes the assurance of biofuel sustainability data on behalf of reporting parties. They must be independent of the reporting party whose data they are verifying.
Voluntary scheme	Schemes run by independent organisations that offer a route to providing assurance that biofuels meet certain sustainability criteria.