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## Contents

Executive summary 7  
The Renewable Transport Fuel Obligation 7  
Greenhouse Gas Emissions Reporting Regulations 9  
Reporting carbon and sustainability information 9  
Applying for certificates 10  
Annual reporting 10  
Land use for biofuels 10  
Greenhouse gas emissions 11  
Chain of custody and mass balance 11  
Use of voluntary schemes to demonstrate compliance 11  
Reward for wastes, residues, dedicated energy crops and RFNBOs 12  
Development fuel target 12  
Verification 12  
Annexes to this document 13  
Implications of leaving the EU 13  

1. Introduction 14  
   Legislative framework 14  
   Related resources 17  

2. Reporting carbon and sustainability information 18  
   Introduction 18  
   Who should report C&S information to the RTFO Administrator 18  
   Reporting frequency and timetable 19  
   What to report 19  
   Filling in the C&S report 22  
   Arranging verification 32  
   Reporting biofuel that meets a voluntary scheme 32  
   Changing C&S data 33  
   Further guidance and resources 33  
   Publication of information 33
3. Annual reporting

4. Demonstrating compliance with the land criteria
   Land requirements of the RED
   Demonstrating compliance with the land criteria
   Voluntary schemes
   The RTFO Biofuel Sustainability Standard
   The RTFO Biodiversity Audit
   Land-use categories and RED compliance
   Further guidance/resources

5. Demonstrating compliance with the Greenhouse Gas savings criteria
   Terminology
   GHG savings requirements of the RED
   Demonstrating compliance with the GHG criteria
   Assessing the carbon intensity of your biofuel
   Reporting using the fuel chain default values
   NUTS2 (Article 19(3))
   Assessing the carbon intensity of a RFNBO
   Calculating the GHG saving of a renewable fuel
   Aggregating consignments with different carbon intensities

6. Reporting actual Greenhouse Gas data and assessing land-use change impact
   Calculating biofuel carbon intensity based on actual data
   Calculating a RFNBO carbon intensity based on actual data
   Calculating a GHG intensity of part RFNBO, part non-RFNBO fuels from actual data
   Methodology for reporting land-use change emissions

7. Indirect Land Use Change value reporting

8. Demonstrating compliance with the mass balance rules
   Guiding principles
   Terminology
   Aggregating multiple consignments
   Which chain of custody systems are permitted for C&S reporting?
   When to set up a chain of custody
   Guidance for operating a mass balance type of chain of custody

9. Wastes, residues and dedicated energy crops
   Summary
   Definitions
Identifying which waste and residue materials are double rewarded 95
List of wastes, residues and dedicated energy crops 96
Categorisations under the RTFO 97
Demonstrating that a biofuel feedstock is a waste or residue 97
GHG emission calculations for wastes and residues 98
10. Demonstrating compliance: evidence requirements 99
   Introduction 99
   Evidence requirements for key C&S data 99
   Evidence from audits within the supply chain 102
   Transport evidence and contracts 103
   Other evidence 105
11. Appointing a verifier 106
   Roles and responsibilities 106
   Assurance standards - ISAE 3000 107
   Independence of verifiers and ethical requirements 108
   Professional competencies and capability 108
   Quality control 108
   Preparing for verification 109
Annex A: Recognition of voluntary schemes 111
   Recognition of voluntary schemes by the Commission 111
   Recognition of voluntary schemes by the RTFO Administrator 114
Annex B: Recognition of other Member States' national systems 116
   Introduction 116
   Identification of other Member States' national systems 117
   National systems assessed by the RTFO Administrator 118
Annex C: Biofuel Sustainability Standard criteria and indicators 119
   Environmental criteria and indicators 119
   Social criteria and indicators 123
   RTFO norm for audit quality criteria 125
   Additional field guidance for auditors 126
Annex D: Biodiversity Audit 127
Annex E: Known future updates to carbon and sustainability reporting 129
   Outcomes of Comitology process 129
   Information to be published by the Commission 130
   Information published by the RTFO Administrator 130
Annex F: Example chain of custody records 131
Executive summary

This guidance document aims to provide assistance on carbon and sustainability (C&S) reporting under the Renewable Transport Fuel Obligations Order 2007 No. 3072 ("the RTFO Order"), as amended.

It sets out the sustainability criteria for biofuels and renewable fuels of non-biological origin (RFNBOs) supplied under the RTFO and how to demonstrate compliance. Throughout this document, we refer to biofuels and RFNBOs as renewable fuels. Where there are specific provisions for RFNBOs or partially renewable fuels these have been highlighted. The following summary provides an overview of the contents of this guidance and key issues.

The Renewable Transport Fuel Obligation

The RTFO is one of 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 GHG emissions from the road transport sector by encouraging the supply of renewable fuels. It was amended from 15 December 2011 to implement the transport elements of Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources (the 'Renewable Energy Directive' (RED)).

Under the RTFO, those supplying renewable fuels must meet specified sustainability criteria for their fuels to be recognised as fuels entitled to receive Renewable Transport Fuel Certificates (RTFCs). Obligated fuel suppliers are required to redeem a number of RTFCs in proportion to the volume of fossil fuel and unsustainable renewable fuels they supply. RTFCs may be earned by any company supplying sustainable renewable fuels. 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 renewable fuel that they would otherwise have had to supply.

From April 2013, the RTFO includes gas oil and renewable fuels used in non-road mobile machinery¹ (NRMM). It included a consequential change to the target to ensure that the volume of renewable fuel required under the RTFO remained the same.

The RTFO Order was further amended from 15 April 2015, including to increase the reward for certain renewable gaseous transport fuels, to align the treatment of hydro treated vegetable oil (HVO) and fatty-acid-methyl-ester (FAME), and to clarify the approach to rounding of RTFCs and fuel volumes.

¹ The changes include renewable fuel and liquid fuel used in non-road mobile machinery, agricultural and forestry tractors, inland waterway vessel and recreational craft when not at sea. These end uses are collectively termed 'NRMM'.
From April 2018 the RTFO Order is further amended to implement elements of Directive 2015/1513 (known as the ‘Indirect Land Use Change (ILUC) Directive’), which amends the RED. These elements include: updated GHG savings thresholds for renewable fuels; a requirement for Member States to report on ILUC values for land-based (crop) biofuels; and introduction of definitions for wastes and residues. A definition for dedicated energy crops is also provided.

The amended RED also sets a maximum on the amount of crop-derived biofuels which may be counted towards renewable transport targets and recommends the introduction of a specific target for advanced biofuels. A crop cap has been introduced for Year 11 of the RTFO (from 15 April 2018) and a target for a specific sub-set of advanced fuels termed ‘development fuels’ has been introduced in 2019 of the RTFO (from 1 January 2019). Development fuels supplied during Year 11 will be rewarded with development fuel RTFCs, which can be carried over into 2019.

In addition, renewable fuel volume targets are set out to 2032 and beyond, and several new fuel types are made eligible for support under the RTFO including aviation fuel, hydrogen and other RFNBOs.

**Key features of the RTFO**

- Mandatory sustainability criteria have to be met for renewable fuels to be issued with RTFCs and count towards meeting suppliers’ obligations.
- Renewable fuel 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.
- Biofuels from certain wastes or residues, plus dedicated energy crops and RFNBOs, are double rewarded. These fuels receive twice as many RTFCs as biofuel from feedstocks eligible for single reward.
- From 15 April 2018, crop-derived biofuels are allowed to meet the obligation up to a maximum limit. This cap will apply to a supplier’s total annual UK fuel supply and will begin at 4% for Year 11 of the RTFO.
- From 1 January 2019, a specific target for ‘development fuels’ has been introduced. Fuels that count towards the development fuel target will be awarded double ‘development fuel’ RTFCs.
- RTFCs will only be issued once C&S data has been verified.
- Most suppliers will not need to submit annual sustainability reports.
- A chain of custody must be in place between the origin of the feedstock and the UK duty point. Mass balance of C&S data is permitted along the supply chain.


The transport elements of the RED were implemented in the UK on 15 December 2011.

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3 In this guidance, references to the UK duty point will also apply where relevant to the assessment time, as defined in the RTFO Order, for fuels that do not have a UK duty point (such as avtur and hydrogen used in fuel cell vehicles). See Process Guidance for further details.
The RED is closely linked to Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels (the ‘Fuel Quality Directive (FQD)’) and both Directives include mandatory C&S requirements that must be met if biofuel is to count towards EU targets. Both directives include a number of reporting requirements.

This guidance has been updated to reflect the changes made to the RTFO Order in transposing the requirements of the ILUC Directive.

Greenhouse Gas Emissions Reporting Regulations

A GHG emissions reporting requirement was introduced for fuels supplied from 1 January 2013. The Motor Fuel (Road Vehicle and Mobile Machinery) Greenhouse Gas Emissions Reporting Regulations 2012 No. 3030 (‘the GHG Reporting Regulations’) implement the reporting requirements from Article 7a of the FQD. Although distinct from the RTFO, the regulations affect suppliers obligated under the RTFO.


Separate guidance now covers all aspects of the GHG Reporting Regulations (as amended), including new reporting requirements and the mechanism to implement the 6% GHG saving target under the FQD.

This will replace the previous separate guidance for fossil fuel suppliers reporting under the GHG Reporting Regulations, and also Chapter 4 of the previous RTFO C&S guidance.

Reporting carbon and sustainability information

The RTFO Administrator (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 introduced mandatory criteria. Implementation of the ILUC Directive from April 2018 updates the GHG thresholds in the mandatory criteria.

The sustainability requirements for the RED and FQD are identical. The sustainability criteria are that:

- renewable fuels produced in installations starting renewable fuel production on or before 5 October 2015 must achieve at least a 50% GHG emissions saving;
- renewable fuels produced in installations starting renewable fuel production after 5 October 2015 must deliver at least a 60% GHG emissions saving;
- 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.

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 of sustainable biofuel supplied. For biomethane, 1.9 RTFCs may be claimed per kilogram of biomethane supplied, and 1.75 RTFCs per kilogram of biobutane or biopropane (or for a combination of both). For hydrogen, 4.58 RTFCs may be claimed per kilogram of renewable hydrogen supplied. Fuel from certain feedstocks which are classed as a waste or residue, or from a dedicated energy crop, or RFNBOs are incentivised by awarding double the RTFCs per litre or kilogram supplied.

Sustainability data supplied must be verified by a qualified third party (see Verification below) before RTFCs will be awarded. 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. In addition to the C&S guidance, 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.

This 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. From 1 October 2015, following the application of the European Commission Regulation 1307/2014 on highly biodiverse grassland⁴, it is also possible for suppliers to conduct their own RTFO Biodiversity Audits to demonstrate compliance with the biodiversity criteria.

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Greenhouse gas emissions

Suppliers must also be able to demonstrate that their biofuels achieve a minimum level of GHG saving.

Chapters 5 and 6 detail how to demonstrate compliance with the GHG requirements, assessing carbon intensity and using default or actual carbon values for feedstock cultivation, biofuel processing and/or transport.

The Commission has published default carbon intensity values for many of the more commonly used feedstocks. These defaults are intentionally set conservatively to underestimate carbon savings. Suppliers should report actual values if they wish to demonstrate higher carbon savings, if the default does not meet the required GHG saving, if there has been a RED-compliant land-use change, 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 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 material. It ensures that for every unit of sustainable biofuel sold, the corresponding sustainable feedstock has been produced.

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. 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 8.

Use of voluntary schemes to demonstrate compliance

The European Commission can assess and then recognise, through an implementing decision, a voluntary scheme as demonstrating compliance with the RED sustainability requirements, including the GHG and land-use criteria (biodiversity, carbon stocks and peatlands), the mass balance chain of custody system, and audit quality requirements. Voluntary schemes are recognised by the 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 system.

Voluntary schemes that are recognised by the Commission are automatically recognised under the RTFO and can be used to demonstrate compliance with the criteria for which they are recognised. Other schemes are not automatically accepted under the RTFO.

Suppliers therefore have the option to use recognised voluntary schemes, where they are available, to demonstrate compliance with the C&S criteria under the RTFO. Please see Annex A for more information. Recognised voluntary schemes are also listed on the RTFO guidance webpages.
Reward for wastes, residues, dedicated energy crops and RFNBOs

Renewable fuels derived from certain waste or residue feedstocks are awarded double the RTFCs per litre or kilogram supplied.

The Administrator will award double RTFCs where it believes it is appropriate to do so in light of the ‘effects’ set out in the Energy Act (2004) Section 126(4) produced by that fuel. These are the effects of the production, supply, or use of fuel derived from such feedstocks on: carbon emissions; agriculture; other economic activities; sustainable development; or the environment generally. When making a decision to award double RTFCs the Administrator must consider any alternative uses and alternative disposal outcomes which could have been adopted or used for the relevant residue or waste.

Biofuels derived from dedicated energy crops, and RFNBOs, are eligible for double reward per litre or kilogram supplied.

Fuels that are 'double rewarded' are also worth twice as much, by energy content, when calculating progress towards the renewable transport target in the RED (‘double counting’). However, they do not count twice for the purposes of meeting the UK’s overall renewable energy target under the RED.

Biofuels derived from wastes, residues (with the exception of residues from agriculture, aquaculture, fisheries\(^5\) and forestry) and RFNBOs 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, and defaults may be used where available. Dedicated energy crops and residues from agriculture, aquaculture, fisheries and forestry are land using and therefore have to demonstrate compliance with the land use criteria.

An explanation of the Administrator’s approach to wastes, residues and dedicated energy crops can be found in Chapter 9.

Development fuel target

From 1 January 2019, the Administrator introduced a specific target for 'development fuels'. Feedstocks and fuels that count towards that development target will be awarded double 'development fuel' RTFCs.

These certificates will be awarded from 15 April 2018, such that development fuels supplied during Year 11 of the RTFO can be carried over and redeemed against the target in 2019. See Chapter 9 for information on eligible feedstocks and the Process Guidance for information on qualifying fuel types.

Verification

For suppliers to receive RTFCs, independent verification (or assurance) of the C&S data of their renewable fuel must be carried out.

\(^5\) 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.
This must be conducted 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.

A revised version of ISAE 3000 was published in December 2013, effective for assurance reports dated on or after 15 December 2015. The RTFO Guidance has been updated to reflect the changes to ISAE 3000. Guidance on appointing a verifier can be found in Chapter 11 of this document and further information is published in the Guidance for Verifiers.

Annexes to this document

This document is supported by a series of annexes which provide supplementary information. These annexes cover voluntary schemes, other Member States' national systems, 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 and a summary of the changes made in this version of the C&S guidance.

Implications of leaving the EU

On 29 March 2017 the Government invoked Article 50 of the Treaty of the European Union, starting the negotiations to leave the EU. Until these negotiations are concluded, the UK remains a full member of the European Union and all the rights and obligations of EU membership remain in force. During this period the Government will continue to negotiate, implement and apply EU legislation.
1. Introduction

Chapter summary
This chapter outlines the purpose of this document and the legislative framework. 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 C&S data under the RTFO.

1.1 This document provides a detailed explanation of how to comply with the C&S criteria of the RTFO and is provided for use by obligated fossil fuel suppliers, renewable fuel suppliers, verifiers acting on the behalf of suppliers, relevant trade associations and other interested parties.

Legislative framework

1.2 The Government seeks to reduce the GHG 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.

1.3 The RTFO Order is a legal instrument that encourages reductions in GHG emissions in the UK by substituting some of the fossil fuels used in road transport and NRMM with sustainably-sourced biofuels. It is the mechanism through which the transport elements of the RED have been implemented in the UK.

1.4 A second EU Directive, the 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 GHG emissions in the fuel they supply in 2020, judged against a baseline of average fossil fuel lifecycle emissions. It also imposes an annual reporting requirement.

1.5 The GHG Reporting Regulations implement the GHG reduction and reporting requirements from the FQD. These require suppliers to report emissions from fossil fuels and renewable fuels. Reporting deadlines are the same as those under the RTFO and, where possible, we intend to enable suppliers to report data once for use under both schemes.

1.6 From April 2018, the GHG Reporting Regulations are amended in order to implement the FQD Article 7a implementing Directive. New guidance will cover all aspects of the GHG Reporting Regulations (as amended), including new reporting requirements and the mechanism to implement the 6% GHG saving target under the FQD.
1.7 Under the RTFO Order suppliers of road transport fuel and non-road mobile machinery are obliged to demonstrate that an amount of sustainable renewable fuel, equivalent to a specified percentage of their total fuel supplied to the UK, has been supplied to the UK market. This obligation can either be met by supplying renewable fuel, thereby directly claiming RTFCs that can be redeemed, or by purchasing RTFCs from other suppliers, or a combination of the two. A buy-out option is also available.

1.8 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 to transpose the transport elements of the RED into UK legislation. The most significant change was the introduction of mandatory carbon and sustainability (C&S) criteria for biofuels in the UK and the introduction of double counting for biofuels derived from certain wastes and residues. Suppliers must demonstrate that their fuels meet these criteria for those fuels to contribute to the total volume of renewable fuel they are obliged to account for.

1.9 The criteria include a requirement for suppliers to show that their biofuels deliver a minimum GHG reduction against the equivalent fossil fuel. In addition, the cultivation of biofuel feedstocks should not cause loss of carbon stocks or biodiversity.

1.10 Renewable fuel 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 a supplier's obligation.

1.11 The RTFO Order was amended for fuel supplied from 15 April 2013 to cover suppliers of fuel for use NRMM. To ensure that the overall amount of renewable transport fuel supplied in the UK for transport purposes remained the same, whilst expanding the scope of the RTFO, an amendment was made to slightly lower the obligation level. The RTFO Order was further amended from 15 April 2015 to increase the reward for certain renewable gaseous transport fuels, to align the treatment of HVO and FAME, and to clarify the approach to rounding of RTFCs and fuel volumes.

1.12 From April 2018 the RTFO is further amended to implement elements of the amended RED including updated GHG savings thresholds, a requirement for Member States to report on ILUC values for land-based (crop) biofuels, and introduction of definitions for wastes, residues and dedicated energy crops.

1.13 The amended RED sets a maximum on the amount of crop-derived biofuels which may be counted towards renewable transport targets and recommends the introduction of a specific target for advanced biofuels. A crop cap has been introduced for Year 11 of the RTFO (from 15 April 2018) and a target for a specific sub-set of advanced fuels termed 'development fuels' was introduced in 2019 of the RTFO (from 1 January 2019). Development fuel RTFCs, can be carried over into 2019.

1.14 Renewable fuel volume targets are also set out to 2032, and several new fuel types are made eligible for support under the RTFO, including aviation fuel, hydrogen and other RFNBOs.

About the RTFO Guidance

1.15 The RTFO Guidance comprises three documents which should be read alongside each other: Part One: Process Guidance; Part Two: Carbon and Sustainability Guidance (this document); and Part Three: Guidance for Verifiers. Alongside these documents, the GHG Reporting Regulations Guidance provides detail on how to comply with the GHG Reporting Regulations.
RTFO Guidance Part One: Process Guidance

1.16 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 verifiers’ opinions, to trading RTFCs.

RTFO Guidance Part Two: Carbon and Sustainability Guidance

1.17 The Carbon and Sustainability Guidance outlines the process for reporting and verifying C&S data to the RTFO Administrator.

1.18 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, evidence requirements and mass balance rules that should be applied, as well as the requirements to verify data supplied to the RTFO Administrator.

1.19 As well as the main chapters, there are also eight annexes to the C&S Guidance. These provide supplementary information and cover:

- Voluntary schemes;
- Member State national systems;
- The RTFO Biofuel Sustainability Standard;
- RTFO Biodiversity Audit;
- Known future updates to C&S reporting;
- Example chain of custody records;
- A glossary of terms;
- Overview of changes compared to the previous guidance version.

1.20 This document relates to fuels which pass the duty point between 1 January 2019 and 31 December 2019 i.e. 2019 obligation period. The RTFO guidance webpages on Gov.uk include guidance for earlier reporting periods.

1.21 This is a guidance document only and does not constitute legal advice on how the Order should be interpreted.

1.22 Queries or comments should be directed to the DfT’s RTFO Unit at rtfo-compliance@dft.gov.uk.

RTFO Guidance Part Three: Guidance for Verifiers

1.23 The Guidance for Verifiers has been produced specifically for verifiers responsible for providing assurance of C&S data provided by suppliers as well as of volumes of fuels without a defined duty point and of eligibility of development fuels. Renewable fuel suppliers undertaking verification of their biofuels to apply for RTFCs may also find this a useful resource.

GHG Reporting Regulations guidance

1.24 The GHG Reporting Regulations Guidance is aimed at suppliers of renewable transport fuel, fossil fuel (including low carbon fossil fuels), and electricity for use in road transport, and outlines how to comply with the GHG Reporting Regulations, which are the mechanism to implement Article 7A of the FQD. The mechanism is designed to operate in tandem with the RTFO as far as is possible to minimise burden on suppliers.
1.25 Any biofuel used to comply with the GHG mechanism is required to meet the same C&S requirements as under the RTFO. The GHG Regulations Guidance therefore refers to the C&S requirements in the RTFO guidance documents mentioned above.

Related resources

Tools for greenhouse gas calculations

1.26 A number of tools are supplied on the RTFO guidance webpages 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 default 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 data and templates**: This spreadsheet provides templates for carbon intensity (GHG) 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. The spreadsheet also 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

1.27 A table is supplied online listing which voluntary schemes are accepted by the Commission and/or the RTFO Administrator.

1.28 For each voluntary scheme the table lists which of the RED sustainability requirements they have been recognised as meeting. It also sets out the dates from which these schemes are accepted and the appropriate version of each scheme that is accepted.

Information on fuels and feedstocks

1.29 A list of feedstocks including wastes and residues is maintained online alongside a list of renewable fuels.

Additional documents

1.30 Additional sources and documents relevant to this guidance, including relevant legal instruments, are available online. Communications from the Commission are available on the Commission's biofuels webpages.

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6 Although note that under the GHG Reporting Regulations, RFNBOs do not have to meet the RTFO GHG threshold.
7 Note that the Carbon Calculator can now also be used by economic operators in the Republic of Ireland reporting under the Irish Biofuel Obligation System. When prompted to select the reporting scheme upon opening the calculator, economic operators reporting under the RTFO should select "UK - Renewable Transport Fuel Obligation or Renewables Obligation".
Chapter summary
This chapter sets out the requirements for C&S reporting by fuel suppliers to the RTFO Administrator. This reporting is necessary to demonstrate compliance with the RED sustainability criteria and to gain RTFCs. It includes who needs to report, and what information should be reported and when. It also covers verification requirements.

Introduction

2.1 RTFCs are the mechanism by which suppliers demonstrate compliance with the RTFO. Suppliers may apply for RTFCs for all sustainable renewable fuels owned at the duty point. One RTFC is awarded for every litre of sustainable renewable fuel. For biomethane, 1.9 RTFCs may be claimed per kilogram of biomethane supplied, and 1.75 RTFCs per kilogram of biobutane or biopropane (or for a combination of both). For hydrogen, 4.58 RTFCs may be claimed per kilogram of renewable hydrogen supplied. Fuel from certain feedstocks which are classed as a waste or residue (see Chapter 9), dedicated energy crops and RFNBOs are incentivised by awarding double the RTFCs per litre or kilogram supplied.

2.2 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 or 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 Any parties 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.

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8 For fuels that are not subject to duty - including avtur, hydrogen used in fuel cell vehicles and gases in NRMM - alternative assessment times are defined, see Process Guidance, Chapter 1.

2.5 All suppliers wishing to apply for RTFCs for their renewable fuels must report independently verified information on the sustainability of their fuels 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 renewable fuels which do not meet the mandatory sustainability criteria, or which do not receive independent verification will not be awarded RTFCs. The renewable fuel will be treated as fossil fuel and for suppliers of over 450,000 litres of road transport or non-road mobile machinery fuel it will count towards their obligation. See the Process Guidance for more information.

Reporting frequency and timetable

2.7 Suppliers must arrange for their data to be independently verified before they can submit an application for RTFCs.

2.8 Suppliers may choose how often to apply for RTFCs within the given reporting period. 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 RTFC applications within a given reporting period is set out in the Process Guidance.

2.9 Obligation periods will run from 1 January to 31 December each year. Please see Process Guidance for full details, including on changes to the reporting timetable.

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:

- **GHG emissions savings (Article 17(2)):** Renewable fuels produced in installations operating on or before 5 October 2015\(^\text{10}\) must achieve at least a 50% GHG emissions saving. Renewable fuels produced in newer installations which started operating after 5 October 2015 must deliver at least a 60% GHG emissions saving.

- **NUTS2 (Article 19(3)):** The ILUC Directive amended Article 19(3) of the RED on the use of default values and disaggregated default values. The Administrator now allows the relevant GHG default value to be reported for all types of biofuels, whether they are derived from EU or non-EU crops.

Thus, the restriction that the relevant default values can only be used (1) where biofuels are cultivated outside the EU, or (2) cultivated in regions in the EU, where cultivation emissions from the relevant biofuel feedstock are below the

\(\text{10}\) If an installation has converted from production of non-renewable fuel to production of renewable fuel, the operational date is deemed as the date on which renewable fuel was first produced at the facility.

\(\text{11}\) Nomenclature of territorial units for statistics, level-2:
http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction
disaggregated default for cultivation, no longer applies. Suppliers can still use NUTS2 cultivation values when calculating their fuel carbon intensity. Member State reports on emissions from cultivation are published on the Commission website.\(^\text{12}\) Note that revised NUTS2 codes (NUTS2013) came into effect from 1 January 2015.\(^\text{13}\)

- **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. The EU adopted a Regulation on the definition of highly biodiverse grasslands on 8 December 2014, which applies from 1 October 2015. The text of the regulation can be found here - see link. The Commission has also provided guidance to voluntary schemes on the implementation of this definition (see link).

- **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 Union must be cultivated according to the 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 many renewable fuels compliance with all these criteria can be demonstrated through reporting a Commission-recognised voluntary scheme. 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 renewable fuels 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;
- voluntary scheme(s);
- land use on 1 January 2008;
- carbon intensity.

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\(^{13}\) The revised codes are not expected to have a significant impact on suppliers. Revised codes relate to both boundary changes and some new regions, and affect some feedstocks supplied from Greece, France, Slovenia and the UK (largely metropolitan areas). A detailed summary of these changes and other historical changes to statistical regions can be found on the Eurostat website ([http://ec.europa.eu/eurostat/web/nuts/history](http://ec.europa.eu/eurostat/web/nuts/history)). Note that some NUTS2 regions will now have the compliance status “unknown” until that Member State updates its NUTS2 report ([http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels](http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels)). Suppliers should report the new NUTS2 region codes from 1 January 2015 and are advised to check the Carbon Calculator for the new compliance status.
2.15 Suppliers may operate a site-based mass balance system to allocate sustainability data (by administrative consignment) to physical consignments of biofuel. See Chapter 8 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 cannot exceed the volume of renewable fuel supplied in that period.

2.18 Consignments may be split and entered as separate consignments for more than one period to accommodate this requirement.

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

**How are biofuels produced from wastes and residues treated?**

2.20 Certain wastes or residues are double rewarded. This means that one litre of biofuel produced will receive two RTFCs.\(^{14}\)

2.21 From 15 April 2018, ligno-cellulosic and non-food cellulosic materials are included in the category ‘dedicated energy crops’. These materials are double rewarded and are also required to comply with the land-use criteria. They do not count towards the crop cap or towards the development fuel target.

2.22 From 1 January 2019, the Administrator introduced a specific target for ‘development fuels’. Feedstocks and fuels that count towards that target will be awarded double RTFCs, see Process Guidance, Chapter 2, and Chapter 9 of this guidance.

2.23 For materials that meet the definition of wastes in the amended Order, 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 voluntary schemes that cover, for example, the GHG calculation or the chain of custody may be relevant);
- land-use on 1 January 2008.

2.24 Providing C&S data that demonstrates whether the biofuel met the land criteria, however, is required for agricultural, aquacultural, fisheries\(^ {15} \) and forestry residues.

2.25 Chapter 9 sets out further guidance relating to feedstocks considered wastes, residues and dedicated energy crops. The list of those which are considered wastes, agricultural, aquacultural, fisheries and forestry residues, and dedicated energy crops for RTFO C&S reporting is published on the Gov.uk website.

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\(^{14}\) For biogases produced from certain feedstocks that are wastes or residues, ligno-cellulosic or non-food cellulosic materials, the number of certificates will be doubled to 3.8 and 3.5 RTFCs per kilogram of biomethane and biobutane or biopropane (or a combination of both biobutane and biopropane) respectively.

\(^{15}\) 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.
How are partially renewable fuels treated?

2.26 For the purposes of assessing sustainability, the calculated renewable volume of a partially renewable biofuel (see Process Guidance) is treated as a renewable fuel and subject to the same assessment of sustainability as wholly renewable biofuels.

2.27 For the purposes of sustainability reporting, including calculation of GHG emissions, every feedstock is considered to be a separate consignment, and any non-renewable feedstock is not included. In the case of feedstocks of mixed fossil and renewable content (e.g. MSW), only the renewable part of the feedstock is considered to be within the consignment.

How are renewable fuels of non-biological origin treated?

2.28 Under the RED, renewable fuels of non-biological origin (RFNBOs) are double counted towards Member States' renewable transport targets and towards suppliers' obligations. RFNBOs are double rewarded under the RTFO. This means that one litre of renewable fuel of non-biological origin will receive two RTFCs\(^\text{16}\).

2.29 The sustainability requirements for biofuels laid out in the RED must also be satisfied for RFNBOs but it is not required to report on the land criteria. This means that the following sustainability data is not required:

- whether the fuel met a voluntary scheme that covers the land criteria (though voluntary schemes that cover, for example, the GHG calculation or the chain of custody may be relevant);
- land-use on 1 January 2008.

2.30 Due to the different nature of RFNBOs compared to biofuels (see RFNBO definition in the Process Guidance) a different, though comparable, method for calculating fuel GHG emissions is required for RFNBOs, as detailed in Chapter 6.

How are part RFNBO, part non-RFNBO fuels treated?

2.31 For the purposes of reporting volumes to ROS, the calculated (non-bioenergy) renewable volume of a part RFNBO, part non-RFNBO fuel (see Process Guidance) is treated as a RFNBO. However, part RFNBOs, part non-RFNBO fuels are subject to a slightly different assessment of sustainability compared to wholly RFNBOs, since the calculation of GHG emissions does not have separate feedstock consignments, and hence all portions of a part RNFBO, part non-RFNBO fuel are assigned the same GHG intensity (based on sharing the process energy inputs).

Filling in the C&S report

2.32 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.

\(^{16}\text{For renewable gaseous fuels of non-biological origin, the number of certificates will be doubled to 3.8 RTFCs per kilogram of RFNBO methane and 3.5 RTFCs per kilogram of RFNBO butane or RFNBO propane (or a combination of both RFNBO butane and renewable propane) respectively, and 9.16 RTFCs per kilogram of RFNBO hydrogen.}\)
2.33 Table 1 describes the information which should be provided for each consignment of renewable fuel, as well as which of these data fields are required, and which are elective. Note, however, that for some fuels the elective fields may influence whether a consignment can be identified as RED compliant.

2.34 Suppliers can save incomplete administrative consignments in ROS (i.e. where all the information is not yet available) but will not be able to submit these to their verifiers as part of the application for RTFCs until they are complete. The C&S report should not be submitted to the Administrator, nor RTFCs applied for, until the required information is provided and verified. Administrative consignments cannot be submitted without the verifier's statement.

2.35 A free software tool is provided by the RTFO Administrator - called the UK and Ireland Carbon Calculator - which can be used to prepare C&S reports that can be uploaded to ROS. It can also be used to calculate carbon intensity values using actual data for fuel chains.

2.36 An example summary of reported consignments is shown in Table 2.

2.37 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.

2.38 These columns will automatically populate to indicate whether the renewable fuel 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 and is ready for verification.

2.39 Some of the existing ROS data field headings refer to biofuels rather than all renewable transport fuels. The naming of the ROS data fields will be reviewed and updated in due course. In the meantime, suppliers of RFNBOs can use the ROS system but will need to provide alternative information in order to complete some of the data fields. This is explained in Table 1.

<table>
<thead>
<tr>
<th>ROS data field and description</th>
<th>Compulsory or elective and reporting options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative consignment number</td>
<td>n/a - automatically generated</td>
</tr>
<tr>
<td>Each consignment number is unique and generated automatically by ROS.</td>
<td></td>
</tr>
<tr>
<td>Internal reference number</td>
<td>Elective</td>
</tr>
<tr>
<td>Elective data field for the supplier to record their own consignment number for reference purposes.</td>
<td>Free field or leave blank</td>
</tr>
<tr>
<td>Fuel type</td>
<td>Compulsory - 'unknown' is not permitted</td>
</tr>
<tr>
<td>The main fuel types for biofuels are biodiesel, bioethanol, or biomethane. A list of renewable fuel</td>
<td></td>
</tr>
</tbody>
</table>
types included on ROS can be found on the Gov.uk website. Contact the RTFO Administrator if you are supplying other biofuel types or RFNBOs.

Select fuel type from drop down list

<table>
<thead>
<tr>
<th><strong>Quantity of fuel</strong></th>
<th>Compulsory</th>
</tr>
</thead>
<tbody>
<tr>
<td>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)(^7) should be reported.</td>
<td>Report the volume (or mass for biomethane)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Biofuel feedstock</strong></th>
<th>Compulsory - ‘unknown’ is not permitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>The feedstock type from which the fuel is made e.g. used cooking oil, wheat. In the case of RFNBOs without any feedstock energy, the process energy type should be given, e.g. solar electricity.</td>
<td>Select feedstock from drop down list</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Biofuel production process</strong></th>
<th>Elective - note this information may be needed to demonstrate compliance with the respective RED GHG savings thresholds for certain feedstocks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The process used for producing the biofuel or RFNBO may be reported.</td>
<td>Select process from drop down list or leave blank</td>
</tr>
</tbody>
</table>

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 available, the process must be known in order to report the lower carbon default and potentially to meet the relevant GHG saving threshold.

The relevant process is dependent on the feedstock, but could be, for example:
- 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 8).

<table>
<thead>
<tr>
<th><strong>Country of origin</strong></th>
<th>Compulsory</th>
</tr>
</thead>
<tbody>
<tr>
<td>The country of origin of the feedstock. In the case of RFNBOs without any feedstock energy, the country of origin of the process energy type is given.</td>
<td>Select country from drop down list</td>
</tr>
</tbody>
</table>

‘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.

<table>
<thead>
<tr>
<th><strong>Voluntary scheme</strong></th>
<th>Elective - note this information may be needed to demonstrate compliance with the respective RED GHG savings thresholds for certain feedstocks.</th>
</tr>
</thead>
</table>

\(^7\) See the Process Guidance for further information on how to determine the renewable component of partially renewable fuels.
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 criteria\(^{18}\).

If the feedstock is a waste or non-agricultural residue, report 'waste/non-ag. residue'\(^{19}\). 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.

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'.

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'\(^{20}\).

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.

This field may also be used to report biofuel that has been verified to be compliant with another Member States' national system which has been included in Annex B.

### Land use on 1 Jan 2008

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.

For guidance on how to report the land-use on 1 January 2008 see Chapter 4.

If the feedstock is a waste or non-agricultural residue (see Chapter 9) report: 'waste/non-ag. residue'\(^{16}\).

If the fuel is a RFNBO (see Process Guidance for full definition) report: 'not applicable'.

Select voluntary scheme (or national system) from drop down list, leave blank\(^{21}\), or if the biofuel is not certified, then 'none - feedstock not certified' should be selected.

Note that only those voluntary schemes accepted by the RTFO Administrator (including those recognised by the Commission) as meeting one or more of the mandatory sustainability criteria are included in ROS.

The first voluntary scheme column automatically defaults to 'waste/non-ag. residue' for feedstocks listed as 'wastes or non-agricultural residues'. Note that if the waste/non-ag. residue met a voluntary scheme this can be reported in one or both of the other voluntary scheme columns.

| Compulsory

| Select appropriate land-use from drop down list.

| '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.

| Automatically defaults to 'waste/non-ag. residue' for feedstocks listed as 'wastes or non-agricultural residues'.

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\(^{18}\) The list of voluntary schemes available to be reported and whether they are recognised by the Commission and/or the RTFO Administrator is available [online](#).

\(^{19}\) The category 'waste/non-agricultural residues' excludes agricultural, aquacultural, fisheries and forestry residues.

\(^{20}\) From 1 October 2015, following the application of Commission Regulation on the definition of highly biodiverse grasslands, it is also possible for suppliers to allow a specific independent audit against the RED biodiversity criteria.

\(^{21}\) Whilst this information may not be required for RTFC applications, it is required as part of the requirements for 'additional information' and may necessitate the submission of a verified annual report. Leaving this field blank will be treated as 'no' - see Chapter 3 for details.
Automatically defaults to ‘not applicable’ for certain feedstocks for which the land criteria are automatically satisfied including RFNBOs and those categories of tallow which do not double count.

<table>
<thead>
<tr>
<th>Plant in operation on or before 5 October 2015</th>
<th>Only required if reporting a GHG saving less than 60%.</th>
</tr>
</thead>
<tbody>
<tr>
<td>This field is used to report whether a renewable transport fuel production plant was in operation on or before 5 October 2015. This determines which GHG emission threshold will apply.</td>
<td>Select Y/N from the drop down list.</td>
</tr>
<tr>
<td>Newer renewable transport fuel production installations that began operating after 5 October 2015 are required to comply with the higher 60% GHG saving threshold for fuels supplied from 15 April 2018.</td>
<td></td>
</tr>
<tr>
<td>Older renewable transport fuel production installations that began operating on or before 5 October 2015 are required to meet a 50% GHG saving.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Carbon intensity (CI)</th>
<th>Compulsory</th>
</tr>
</thead>
<tbody>
<tr>
<td>This field is used to report the carbon intensity expressed in gCO$_2$e/MJ$^{23}$. The carbon intensity calculation, and therefore the figure reported, must include the impact of any direct land-use change.</td>
<td>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, 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).</td>
</tr>
<tr>
<td>This field also links to the ‘Plant in operation on or before 5 October 2015’ column. Whether the reported carbon intensity meets the respective GHG threshold depends on whether the renewable transport fuel production installation was already in operation on or before 5 October 2015 as a higher GHG threshold applies to newer installations which started operation after that date.</td>
<td>Note that the CI will not autopopulate for fuel type/feedstock/process combinations not in RED Annex V - suppliers should enter actual data.</td>
</tr>
<tr>
<td>Where produced in older renewable transport fuel production installations operating on or before 5 October 2015, reporting a carbon intensity of 41 gCO$_2$e/MJ or less for fuels supplied on or after 1 January 2018 will meet the minimum 50% GHG emission saving threshold applicable for older renewable transport fuel production installations$^{24}$.</td>
<td></td>
</tr>
<tr>
<td>Where produced in newer renewable transport fuel production installations starting operation after 5 October 2015, reporting a carbon intensity of 33 gCO$_2$e/MJ or less for fuels supplied from 15 April</td>
<td></td>
</tr>
</tbody>
</table>

$^{22}$ If an installation has converted from production of non-renewable fuel to production of renewable fuel, the operational date is deemed as the date on which renewable fuel was first produced at the facility.

$^{23}$ Grammes of carbon dioxide equivalent per megajoule.

$^{24}$ Note that the cut-off for compliance with the 50% GHG savings threshold is 41.9 gCO$_2$e/MJ, but the carbon intensity can only be reported as a whole number on ROS. Therefore for biofuels where the calculated carbon intensity is 41.5-41.9 gCO$_2$e/MJ, the reported carbon intensity should be rounded down and reported as 41 on ROS, not 42.
2018 onwards will meet the RED threshold of a minimum 60% GHG emission saving\textsuperscript{25}.

For guidance on assessing the carbon intensity of a consignment of biofuel see Chapters 5 and 6.

For guidance on assessing the carbon intensity of the impact of land-use change see Chapter 6.

**Type of GHG data**

This field should be completed where actual data has been supplied for:

- the cultivation stage; or
- for the entire fuel chain.

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).

For guidance on establishing the type of GHG data see Chapter 6.

**Soil carbon accumulation**

This field captures information on whether there has been any soil carbon accumulation due to improved agricultural practice.

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.

**Plant in operation on 23 January 2008**

Under the RED biofuel from installations that were already operational on 23 January 2008 were not obliged to meet the 35% GHG threshold until 1 April 2013. This field should no longer be completed as the exemption for old installations no longer applies.

**Indicative RED compliant columns**

**GHG threshold**

This column reads from the 'Voluntary scheme', 'Carbon intensity', 'Type of GHG data', 'Plant in operation on or before 5 October 2015' and 'Type of GHG data' columns.

\textsuperscript{25} The cut-off for compliance with the 60% GHG savings threshold is 33.52 gCO\textsubscript{2}e/MJ, but the carbon intensity can only be reported as a whole number on ROS. Therefore, for biofuels where the calculated carbon intensity is 33.0-33.52 gCO\textsubscript{2}e/MJ, the reported carbon intensity should be rounded down and reported as 33 on ROS, not 34.

\textsuperscript{26} Whilst this information may not be required for RTFC applications, it is required as part of the requirements for 'additional information' and may necessitate the submission of a verified annual report. Leaving this field blank will be treated as 'no' - see Chapter 3 for details.
<table>
<thead>
<tr>
<th><strong>Biodiversity</strong></th>
<th>Automatically generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>This column reads from the 'Voluntary scheme' and 'Land-use on 1 Jan 2008' columns.</td>
<td>Will show a green Y if the RED biodiversity criteria are met or a red N if not met</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Carbon stock</strong></th>
<th>Automatically generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>This column reads from the 'Land-use on 1 January 2008' and the 'Voluntary scheme' columns.</td>
<td>Will show a green Y if the RED carbon stock and peatlands criteria are met or a red N if not met</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>RED compliant (indicative)</strong></th>
<th>Automatically generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>This column reads from the three previous columns, showing whether the biofuel consignment is indicatively RED compliant.</td>
<td>Will show a green Y if all three of the RED sustainability criteria are met or a red N if not met</td>
</tr>
</tbody>
</table>

**Table 1** Data fields for C&S reporting on ROS
### General information

<table>
<thead>
<tr>
<th>Con. no.</th>
<th>Fuel type</th>
<th>Quantity</th>
<th>Biofuel feedstock</th>
<th>Production process</th>
<th>Country of origin</th>
<th>Voluntary scheme 1</th>
<th>Voluntary scheme 2</th>
<th>Voluntary scheme 3</th>
<th>Land use on 1 Jan 2008</th>
<th>Carbon intensity</th>
<th>Type of GHG data</th>
<th>Soil carbon accumulation</th>
<th>Plant in operation on or before 5 Oct 2015</th>
<th>GHG</th>
<th>Biodiversity</th>
<th>C-stock</th>
<th>RED compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Bio-ethanol</td>
<td>250,000</td>
<td>Wheat</td>
<td>Nat. gas CHP</td>
<td>Ukraine</td>
<td>-</td>
<td>-</td>
<td>Grassland</td>
<td></td>
<td>76</td>
<td>-</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
</tr>
<tr>
<td>02</td>
<td>Bio-ethanol</td>
<td>250,000</td>
<td>Bagasse</td>
<td>Brazil</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
<td>35</td>
<td>Actual fuel chain data</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>Bio-diesel</td>
<td>1,000</td>
<td>Oilseed rape</td>
<td>UK</td>
<td>Red Tractor</td>
<td>ISCC</td>
<td>Cropland- non-protected</td>
<td>52</td>
<td>-</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>Renewable avtur</td>
<td>100,000</td>
<td>Sugar cane</td>
<td>Brazil</td>
<td>ISCC</td>
<td>Cropland-protected</td>
<td>38</td>
<td>Actual fuel chain data</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Hydrogen</td>
<td>1,500</td>
<td>Solar electricity</td>
<td>UK</td>
<td>-</td>
<td>N/A</td>
<td>9</td>
<td>-</td>
<td>N</td>
<td>14</td>
<td>-</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>06</td>
<td>Bio-diesel</td>
<td>250,000</td>
<td>UCO</td>
<td>Croatia</td>
<td>ISCC</td>
<td>Waste/ non-ag. residue</td>
<td>15</td>
<td>-</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>07</td>
<td>Biogas</td>
<td>150,000</td>
<td>Dry manure</td>
<td>UK</td>
<td>ISCC</td>
<td>Waste/non-ag. residue</td>
<td>15</td>
<td>-</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td></td>
<td></td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

**Table 2 Illustrative C&S reporting data**

27 Supplier consignment number is not shown here but is an available field in ROS.
28 in gCO2e/MJ.
Explanations of example data in the summary C&S data report

2.40 Consignment 01 represents 250,000 litres bioethanol from wheat of Ukrainian origin, reported with land-use change.

- The supplier has reported that the fuel production plant was not in operation on or before 5 October 2015 and therefore the higher 60% GHG saving threshold applies.
- The default chain carbon intensity for ethanol produced from wheat using natural gas as process fuel in a CHP plant is 40 gCO$_2$/MJ. The land-use change impact has been calculated as 36 gCO$_2$/MJ. This figure takes into account increased soil carbon accumulation due to improved agricultural practice, as reported in the soil carbon accumulation column.
- The total, which should be reported, is 76 gCO$_2$/MJ and will need to be overwritten in the carbon intensity field which will auto-populate with the default not including land-use change. This carbon intensity does not meet the RED GHG threshold and so the GHG criterion is not met.
- No voluntary schemes are reported. The land-use category 'grassland' complies with the RED carbon stock criteria and the biodiversity criteria. However, it should only be reported if it can be demonstrated that the land is not, or has not, been highly biodiverse grassland in or after January 2008. In this example, the supplier is not able to provide the necessary evidence to this effect.
- Overall the biofuel scores a 'N' for RED compliance, as the supplier is not able to demonstrate compliance with the biodiversity or the GHG criteria.

2.41 Consignment 02 represents bioethanol from bagasse from Brazil.

- The supplier reported that the fuel production plant was in operation before 5 October 2015 and therefore the 50% GHG emission saving threshold applies.
- 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 gCO$_2$/MJ. This meets the RED GHG saving threshold for older installations of 50%.
- 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 (note that this is a compulsory field on ROS) 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.

2.42 Consignment 03 represents a consignment of UK oilseed rape that meets two voluntary schemes.

- The oilseed rape met the Red Tractor and ISCC schemes which both demonstrate compliance with the carbon stock and biodiversity criteria.
- No land-use change was reported and therefore the carbon intensity default of 52 gCO$_2$/MJ can be reported. The supplier reported that the fuel production plant was in operation on or before 5 October 2015.
• The carbon intensity does not meet the 50% GHG saving threshold, which applies for older installations, and therefore does not meet the GHG saving criterion.

2.43 Consignment 04 represents 100,000 litres of renewable avtur from sugar cane of Brazilian origin.

• The supplier has reported that the fuel production plant was in operation on or before 5 October 2015 and therefore the 50% GHG saving threshold applies.
• Renewable avtur 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 38 gCO$_2$/MJ. This meets the 50% GHG saving threshold.
• The biofuel supplier can provide verifiable evidence that the sugar cane is ISCC certified. ISCC is a standard that has been accepted by the Commission as meeting the RED biodiversity and carbon stocks 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 also demonstrates that the biofuel met the RED carbon stock criteria. Note that reporting ‘cropland-protected’ does not automatically comply with the RED biodiversity criterion. Compliance with this is demonstrated through using the ISCC scheme.
• Overall the renewable avtur is RED compliant.

2.44 Consignment 05 represents 1,500kg of hydrogen.

• The ‘feedstock’ is classed as solar electricity, demonstrating that the hydrogen is a RFNBO.
• The default carbon intensity of hydrogen from renewable electricity is 9.1 gCO$_2$/MJ.
• The supplier has reported that the fuel production plant was not in operation on or before 5 October 2015 and therefore the higher 60% GHG saving threshold applies. The carbon intensity that is reported for the hydrogen meets this threshold.
• The ‘land use on 1 Jan 2008’ is designated ‘N/A’ because RFNBOs are not required to comply with the land-use criteria.
• RFNBOs automatically meet both the RED biodiversity and carbon stock criteria, therefore this consignment is RED compliant overall.

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

• ‘Waste/non-ag. residue’ is auto-populated by ROS in the ‘Land use’ fields.
• No detailed information was available to calculate the carbon intensity therefore the relevant default value is reported (this is also auto-populated in ROS). No information is reported on whether the biofuel production installation was already operational before 5 October 2015, therefore the higher 60% GHG saving threshold of 60% will apply. The carbon intensities reported for these consignments of 14 and 15 gCO$_2$/MJ provide GHG savings above the required RED GHG savings threshold and both consignments are therefore RED compliant for GHG.
• ISCC is a standard that has been accepted by the Commission as meeting the relevant RED sustainability criteria.
• Residues automatically meet both the RED biodiversity and carbon stock criteria.
• Both of these consignments are therefore RED compliant overall.

Arranging verification

2.46 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 RTFCs or hold data for a future application. To apply for RTFCs suppliers must arrange for the data to be verified.

2.47 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 standard\[29\]). It must be undertaken by a person who is independent of the supplier and who has the necessary expertise.

2.48 Chapter 11 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 in respect of this process and gives a brief outline of the steps a verifier will undertake.

2.49 Suppliers are able to 'forward' their C&S data to the verifier on ROS, and the verifier is able to examine the data directly. Once verification is complete, the verifier returns the data to the supplier and uploads their assurance opinion. The supplier will then be responsible for submitting the application including the assurance opinion to the RTFO Administrator.

2.50 The Guidance for Verifiers provides detailed information on the processes which verifiers will undertake. This guidance also provides a useful reference for suppliers preparing for verification.

Reporting biofuel that meets a voluntary scheme

2.51 Using voluntary schemes which have been recognised by the Commission as meeting some or all of the sustainability criteria is the recommended option for demonstrating compliance. Many suppliers are now sourcing all of their biofuel through voluntary schemes.

2.52 Further information on using voluntary schemes to demonstrate compliance with the land and GHG criteria can be found in Chapters 4 and 5, respectively.

2.53 A supplier must be able to provide proof that it has sourced the relevant feedstocks through the voluntary scheme. Note that not all voluntary schemes cover the full chain of custody: where this is the case the supplier will need to ensure that evidence is available back to the point at which the voluntary scheme operates. See Chapter 8 for chain of custody and mass balance requirements and Chapter 10 for evidence requirements.

2.54 Verification effort is likely to be reduced in the case that the biofuel meets a voluntary scheme, particularly where those schemes cover the full chain of custody and all of the sustainability data. Any C&S data included in a C&S report which is not covered by the scope of the voluntary scheme is subject to verification.

\[29\] The RTFO Administrator is not aware of any equivalent standards at the time of publication.
Changing C&S data

2.55 Once C&S data has been assigned to renewable fuel at the duty point, further substitution of the C&S data with a different C&S dataset through the use of mass balance is not permitted\(^{30}\) (see Chapter 8). Note that this is distinct from correcting inaccurate data in relation to the same biofuel - see below.

2.56 Before C&S data is forwarded to a verifier, the data can be changed at any time.

2.57 Once data has been forwarded to a verifier, it cannot be changed (it is 'locked'), unless the verifier passes the data back without providing an assurance opinion.

2.58 Once a verifier has provided an opinion on data, any corrections of 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.

2.59 After RTFCs have been issued, data cannot generally be amended. If suppliers become aware of inaccuracies in their data they must inform the RTFO Administrator within 20 days. RTFCs may be revoked in this case and suppliers may reapply.

2.60 Data cannot be amended after the reporting deadline 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.

2.61 Obligation periods have previously run from 15 April one year to 14 April the following year. From 1 January 2019, the RTFO will move to a calendar year basis (preceded by a shorter ‘Year 11’ obligation period running from 15 April 2018 to 31 December 2018). Once the RTFO moves to a calendar year basis, the deadline for RTFC applications to be received will be 1 May following the end of the calendar obligation year. Please see the [Process Guidance](#) for full details.

Further guidance and resources

2.62 For assistance in entering data in ROS see the help screens within ROS.

2.63 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 operating a mass balance chain of custody system see Chapter 8. For guidance on wastes and residues see Chapter 9.

2.64 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

2.65 The RTFO Administrator publishes regular reports on the sustainability characteristics of renewable fuel supplied under the RTFO.

2.66 Information on renewable fuel supply by company is published annually. Reports are available on the DfT website. Individual applications for RTFCs, information on supplier volumes and verifier opinions will not be published.

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30 This applies whether or not the verification of that C&S data or the application for certificates was successful.
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 C&S information.

3. Transport fuel suppliers are required to submit verified C&S information on at least an annual basis where they have applied for RTFCs, see para 1.27.

3.1 The RED requires that suppliers submit information about the fuels that they supply in addition to the mandatory sustainability criteria\(^{31}\), and that this ‘additional sustainability information’ must be verified. The information has been included as part of the RTFC application process on ROS.

3.2 The additional sustainability information is outlined in Table 3, along with an explanation of what action is required by suppliers to meet the additional sustainability information reporting requirements.

3.3 In most cases, where the additional sustainability information was verified in a supplier’s RTFC applications, no action is required by suppliers. If some or all of the information is not supplied and verified in RTFC applications, suppliers must provide the information with a verifier’s assurance report relating to the data by 15 May immediately following the obligation period during which the fuel was supplied.

<table>
<thead>
<tr>
<th>Additional sustainability information requirement</th>
<th>Acceptable responses for ‘additional information’ requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whether the fuel has been certified or accepted as fulfilling the requirements of a scheme that has been recognised by the Commission(^{32})</td>
<td>Any voluntary scheme from the drop down list or 'none - feedstock not certified.' If this is left blank it will be treated as ‘no’.</td>
</tr>
<tr>
<td>Whether the GHG bonus of 29 gCO(_2)eq/MJ has been applied (for degraded land)</td>
<td>‘Degraded land’(^{33}) in ‘land use on 1 Jan 2008’ or any other land use category from the list</td>
</tr>
<tr>
<td>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</td>
<td>‘Yes’ or ‘No’ in ‘Soil carbon accumulation’ (or ‘n/a’ for wastes/non-ag. residues). If this is left blank it will be treated as a ‘no’.</td>
</tr>
</tbody>
</table>

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31 Article 18(3) and Decision (2011/13/EU)
32 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.
33 ‘Degraded land’ cannot be reported until there is a full definition from the Commission. A draft regulation defining severely degraded and heavily contaminated land is currently being developed by the Commission. If the regulation is agreed, the Guidance will be amended accordingly, although there are no agreed timings at present.
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. The land criteria cover preservation of both biodiversity and 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, fisheries and forestry residues), or certain feedstocks for which the land criteria are automatically satisfied including those categories of tallow which do not double count. It also does not apply to RFNBOs.

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 RTFO. 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.

4.3 The Commission has adopted a Regulation defining the criteria and geographic ranges of highly biodiverse grassland, which applies from 1 October 2015. The text of the Regulation can be found here - see link. The Commission has provided guidance to voluntary schemes on the implementation of this definition (see link).

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

4.4 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 the land’s status remains unchanged when the raw material is obtained.

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

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

36 Peatland that was not drained (either partially or completely).
Cross compliance (Article 17(6))

4.5 Biofuel feedstocks grown in the EU must be cultivated according to the 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

4.6 Reporting a 'voluntary scheme' that has been recognised by the Commission as demonstrating compliance for the land criteria is the recommended option as no further evidence is required.

4.7 Where a voluntary scheme is not available (e.g. for a particular feedstock or region), suppliers have a number of different options to demonstrate compliance with the land criteria:

- Conduct their own field audits against the RTFO Biofuel Sustainability Standard criteria. From 1 October 2015, following the application of Commission Regulation 1307/2014 on highly biodiverse grasslands, it is also possible for suppliers to conduct their own RTFO Biodiversity Audits to demonstrate compliance with the biodiversity criteria.
- Report that biofuel has been verified as compliant with another Member State's national system.
- Report one of the RED-compliant previous land use categories where evidence is available of the land-use in January 2008 for the land that the biofuel feedstock was grown on. The sections below provide further detail on which land use categories are compliant with the RED sustainability criteria.

4.8 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 renewable fuel.

4.9 The following sections provide an overview of how to demonstrate compliance with each of the land criteria.

Biodiversity

4.10 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);
- A Member State’s national system that the Administrator has confirmed provides evidence of RED compliance for supply in the UK (see table online);
- The RTFO Biofuel Sustainability Standard (see Annex C);
- The RTFO Biodiversity Audit (see Annex D);

37 Most Member States' national systems, like the UK's RTFO, operate at the duty point (or alternative assessment times for certain fuels), that is, certain obligations in the national system take effect when fuel passes that point. However, some Member States have national systems that operate in a similar way to voluntary schemes and checks are carried out that biofuel is RED-compliant prior to the duty point. In this scenario it is feasible the biofuel could then be imported into the UK.

38 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. RFNBOs are also exempt from the land criteria.
• A land use on 1 January 2008\textsuperscript{39} of:
  – cropland - non-protected;
  – cropland - protected - no interference with nature protection purpose;
  – grassland\textsuperscript{40} (excludes highly biodiverse grassland);
  – highly biodiverse grassland - no change in status (only applicable for non-natural grassland);
  – forest with canopy cover greater than 30% - no change in status;
  – forest with canopy cover 10-30\textsuperscript{41};
  – wetland - no change in status;
  – undrained peatland - no change in status;
  – settlement\textsuperscript{40};
  – waste/non-agricultural residue\textsuperscript{42}; or
  – not applicable\textsuperscript{43}.

4.11 Note that reporting ‘cropland - protected/protection status unknown’, does not demonstrate compliance with the biodiversity criteria. In such cases additional evidence would be needed e.g. reporting a voluntary scheme that is recognised as meeting the biodiversity criteria.

4.12 The requirement for suppliers to demonstrate compliance with the highly biodiverse grassland criterion applies from 1 October 2015. Demonstrating compliance may be achieved through reporting a voluntary scheme that is recognised in relation to RED Article 17(3)(c) on highly biodiverse grassland, conducting a successful RTFO Biodiversity Audit (see Annex C.; or providing the alternative evidence specified in Annex A.

Carbon stock and peatlands

4.13 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);
• A Member State’s national system that the Administrator has confirmed provides evidence of RED compliance (see table online);
• The RTFO Biofuel Sustainability Standard (see Annex C.);
• A land-use on 1 January 2008\textsuperscript{40} of:
  – cropland - non-protected;
  – cropland - protected/protection status unknown;

\textsuperscript{39} Land-use type definitions are provided in Table 4.

\textsuperscript{40} Note that for this land category an assessment of change in carbon stock must also take place and be included in the lifecycle GHG emissions reported. Therefore, although this land category demonstrates compliance with the land criteria it may not comply with the GHG criteria and relevant GHG savings threshold - see Table 4.

\textsuperscript{41} 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.

\textsuperscript{42} The category ‘waste/non-agricultural residues’ excludes agricultural, aquacultural, fisheries and forestry residues.

\textsuperscript{43} For certain feedstocks such as used cooking oil 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.
— cropland - protected - no interference with nature protection purpose;
— grassland;
— forest with canopy cover 10-30%;
— settlement;
— waste/non-agricultural residue; or
— not applicable.

4.14 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 (only applicable for non-natural grassland);
- forest with canopy cover greater than 30% - no change in status;
- wetland - no change in status;
- undrained peatland - no change in status.

**Cross compliance**

4.15 The Administrator 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**

4.16 As outlined in the previous sections, a reporting party can demonstrate compliance with one or all of the RED criteria by using one or more voluntary schemes. The scope and version of the scheme being reported should be recognised by the Commission or the RTFO Administrator as meeting the requirements. Verifiers may consider other voluntary schemes as part of the evidence, but these will not be available for reporting on ROS.

4.17 Voluntary schemes are recognised by the 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 Commission and the scope for which they are recognised are listed on the Commission's website and in the RTFO guidance table of voluntary schemes online.

4.18 In particular, it should be noted that some voluntary schemes are currently not recognised for Article 17(3)(c) on highly biodiverse grassland. Suppliers will need to take this into account when reporting these schemes from 1 October 2015, when the Regulation on highly biodiverse grassland is applied (see Annex A).

4.19 The RTFO Administrator may also recognise schemes as demonstrating compliance with the RED sustainability criteria.

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44 The RED also permits the use of recognised bilateral or multilateral agreements concluded by the EU 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 Commission. However, should any agreements be announced, the RTFO Administrator would include this as a reporting option for economic operators in an appropriate manner.
4.20 Where a voluntary scheme does not meet all of the land criteria, then suppliers will need to demonstrate compliance with the criteria that are not met through another voluntary scheme or by reporting an appropriate land category. For example, if a scheme is not recognised for highly biodiverse grassland (RED Article 17(3)(c)) then compliance can be demonstrated by reporting 'cropland - non protected'.

4.21 The chain of custody rules of a voluntary scheme must be complied with for a supplier to claim that their biofuel complies. A 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 voluntary schemes, although some schemes may allow the final party reporting to the Administrator to make a claim if they have sourced directly from a certified supplier.

4.22 Suppliers must have evidence that the biofuel in question complies with a voluntary scheme. For example, it is not sufficient to purchase from an economic operator that has been certified against a voluntary scheme unless the biofuel supplied by that entity is accompanied with evidence of meeting the scheme, e.g. a proof of sustainability. This is because being certified under a voluntary scheme does not require that entity to only supply sustainable biofuel.

The RTFO Biofuel Sustainability Standard

4.23 The RTFO Biofuel Sustainability Standard can also be used to demonstrate compliance with the RED land criteria. It comprises five environmental and two social principles as well as a norm for audit quality. These are sub-divided into criteria and indicators which are set out in Annex C. 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. At the time of writing, it is not intended that any further benchmarks of voluntary schemes will be conducted against the principles and criteria.

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.

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 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 From 1 October 2015 suppliers can conduct independent third party audits against the RED biodiversity criteria as a means of demonstrating compliance. Specific requirements for the audit of highly biodiverse grassland are detailed in Annex D.

4.29 The RTFO Administrator strongly recommends that in cases where an existing voluntary scheme is operational that has been recognised by the Commission or the RTFO Administrator to demonstrate compliance with the highly biodiverse grassland criterion, suppliers do not carry out an RTFO Biodiversity Audit.

Land-use categories and RED compliance

4.30 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.

4.31 There are 11 land-use categories based on the RED requirements (see Table 4).

4.32 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).

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

4.34 It should also be noted that the categories 'cropland', 'grassland' and 'forestland' specifically refer to the land cover, while '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.

4.35 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.

4.36 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.

4.37 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.
Further guidance/resources

4.38 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*\(^{45}\). It has no formal legal status.

4.39 The European Committee for Standardisation (CEN) prepared principles, criteria, indicators and verifiers to show that biofuels and bioliquids are sustainably produced.

4.40 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 RED sustainability criteria. The list is not meant to be exhaustive. *Guidance on UK land use evidence sources* can be found online.

4.41 Other sources of information include:

- UNEP World Database on Protected Areas (WDPA)\(^{46}\) - global resource for highly biodiverse and protected areas;
- IUCN Red List\(^{47}\) - global list of threatened species and examples of their known geographical ranges, relevant to biodiversity and protected areas;
- WWF Wildfinder\(^{48}\) - global resource for species distribution, relevant to biodiversity and protected areas;
- reference maps within voluntary schemes accepted by the Commission;
- GlobCover\(^{49}\) - land cover maps based on satellite images;
- Biocarbontracker\(^{50}\) - based on GlobCover, includes analyses of satellite images highlighting vegetation cover change, above ground biocarbon loss and events of deforestation;
- MODIS\(^{51}\) - temporal data on vegetation cover (250m resolution);
- Landsat\(^{52}\) - temporal data on vegetation cover (30m resolution), updated on ongoing basis by US government;
- US Department of Agriculture (USDA) Cropland Data Layers\(^{53}\) - crop-specific land cover data for US;
- Harmonised World Soil Database, FAO/IIASA\(^{54}\) - global database on soil information and land cover.


\(^{46}\) [http://www.wdpa.org/](http://www.wdpa.org/)

\(^{47}\) [http://www.iucnredlist.org/](http://www.iucnredlist.org/)

\(^{48}\) [http://worldwildlife.org/pages/wildfinder](http://worldwildlife.org/pages/wildfinder)

\(^{49}\) [http://due.esrin.esa.int/globcover/](http://due.esrin.esa.int/globcover/)

\(^{50}\) [http://biocarbontracker.com/](http://biocarbontracker.com/)


\(^{52}\) [http://landsat.gsfc.nasa.gov/](http://landsat.gsfc.nasa.gov/)


<table>
<thead>
<tr>
<th>Land-use in January 2008</th>
<th>Description(^{55})</th>
<th>Compliance with RED carbon stock criteria(^{56})</th>
<th>Compliance with RED biodiversity criteria(^{59})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cropland - non-protected</td>
<td>This category includes cropped land, (including rice fields and set-aside(^{57})), and agro-forestry systems where the vegetation structure falls below the thresholds used for the forest categories(^{58}). The cropland is not in a nature-protected area as defined in RED Article 17(3b).</td>
<td>This category of land automatically complies with the RED high carbon stock and peatland criteria.</td>
<td>This category of land automatically complies with the RED biodiversity criteria.</td>
</tr>
<tr>
<td>Cropland - protected/no interference with nature protection purpose</td>
<td>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. 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 Audit.</td>
<td>This category of land automatically complies with the RED high carbon stock and peatland criteria.</td>
<td>This category of land automatically complies with the RED biodiversity criteria.</td>
</tr>
<tr>
<td>Cropland - protected/protection status unknown</td>
<td>This category of cropland should be reported where: a) the cropland had protected status but evidence could not be provided that there was no interference with the nature protection purpose as defined in RED Article 17(3b); or b) the protection status could not be determined.</td>
<td>This category of land automatically complies with the high carbon stock and peatland criteria.</td>
<td>This category of land does not comply with the RED biodiversity criteria.</td>
</tr>
<tr>
<td>Grassland (and other wooded land not classified as forest)</td>
<td>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, but excludes highly biodiverse grassland and cropland lying temporarily fallow for less than 5 years. 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</td>
<td>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.</td>
<td>This category of land automatically complies with the RED biodiversity criteria from 1 October 2015. It should only be reported if it can be demonstrated that the land is not, or has not, been highly biodiverse grassland. This may be achieved through reporting a voluntary scheme recognised for</td>
</tr>
</tbody>
</table>

\(^{55}\) 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 Commission on these definitions will be included in a future version of the Guidance.

\(^{56}\) 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 an appropriate land category or a combination of these.

\(^{57}\) 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.

\(^{58}\) Note that perennial crop plantations are classed as cropland under the RTFO.
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.

<table>
<thead>
<tr>
<th>Highly biodiverse grassland - no change in status</th>
<th>The regulation containing the definition of highly biodiverse grassland was adopted by the EU on 8 December 2014 and applies from 1 October 2015. As of this date it is possible to report this category.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>This category automatically complies with the high carbon stock and peatland criteria.</td>
</tr>
<tr>
<td></td>
<td>This category of land automatically complies with the RED biodiversity criteria from 1 October 2015. It should only be reported for non-natural grassland and furthermore only if it can be demonstrated that the harvesting of the raw material is necessary to preserve the grassland status. This may be achieved through reporting a voluntary scheme recognised for RED Article 17(3)(c) or by conducting a successful RTFO biodiversity audit.</td>
</tr>
</tbody>
</table>

| Forest greater than 30% canopy cover - no change in status | 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. | 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 - 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. |

| 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. |

59 Unless evidence is provided that the production of that raw material did not interfere with those nature protection purposes. This also applies in relation to "Forest 10 to 30% canopy cover", "wetland - no change in status", and "undrained peatland".
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Reporting Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetland - no change in status</td>
<td>Land that is covered with or saturated by water permanently or for a significant part of the year.</td>
<td>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.</td>
</tr>
<tr>
<td>Undrained peatland - no change in status</td>
<td>Undrained peatland is peatland that was not completely drained in January 2008.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>This includes peatland that was not drained at all and peatland that was partially drained.</td>
<td>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 primary forest (and other wooded land with no signs of human disturbance such as logging), in a designated area, or a highly biodiverse grassland.</td>
</tr>
<tr>
<td>Degraded land</td>
<td>The land was not in use for agriculture or any other activity in January 2008; and falls into one of the following categories: 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 b) 'heavily contaminated land' that is unfit for the cultivation of food and feed due to soil contamination. A draft regulation further defining severely degraded and heavily contaminated land is currently being developed by the Commission. If the regulation is agreed, this Guidance will be amended accordingly, although there are no agreed timings at present. It is therefore not currently possible to report this category.</td>
<td>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 sustainability requirements. This cannot be reported until the full definition from the Commission is adopted and comes into effect.</td>
</tr>
</tbody>
</table>
Settlement: 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 category. This category of land automatically complies with the RED biodiverse criteria.

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.

Table 4  Land-use categories and RED compliance

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60 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 Commission in developing its guidelines on the calculation of land carbon stocks.
5. Demonstrating compliance with the Greenhouse Gas savings criteria

Chapter summary
This chapter sets out the 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 renewable fuel consignments through the use of defaults. Suppliers using actual data to report the carbon intensity of their renewable fuel should refer to Chapter 6.

Terminology

5.1 The following terminology will be used throughout this chapter:

- The **carbon intensity** of a renewable fuel refers to the lifecycle emissions of greenhouse gases from the fuel supply chain. It is expressed in units of carbon dioxide equivalents per mega joule of fuel (gCO$_2$/MJ).

- **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 emissions.

- **Carbon saving or greenhouse gas saving** refers to the GHG emissions savings of the renewable fuel relative to the fossil fuel it replaced. It is calculated by comparing the carbon intensity of the fuel 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 gCO$_2$/MJ$^{61}$.

- 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. The term 'old chain installation' refers to any processing installation that was in operation on or before 5 October 2015$^{62}$. The term 'new chain installation' refers to any processing installation that began operation after 5 October 2015. ‘Grandfathering’ refers to renewable fuels produced in installations before certain dates and affects the GHG savings requirements. This is set out in Table 5.

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$^{61}$ Note this is different to the fossil fuel baseline (94.1gCO2e/MJ) which is used to calculate a supplier’s 6% GHG reduction target under the FQD. See the GHG Regulations Guidance for more details.

$^{62}$ If an installation has converted from production of non-renewable fuel to production of renewable fuel, the operational date is deemed as the date on which renewable fuel was first produced at the facility.
Nomenclature of Territorial Units for Statistics or NUTS is a method of defining regions within EU countries employed by the Commission. NUTS2 refers to the second level on the scale and divides the EU into 276 regions.

A compliant NUTS2 region is one in which the emissions from cultivation for a particular biofuel feedstock are equal to or less than the disaggregated default for cultivation. A non-compliant NUTS2 region is one in which the emissions from cultivation for a particular biofuel feedstock are greater than the disaggregated default for cultivation.

GHG savings requirements of the RED

GHG emissions savings (Article 17(2))

5.2 The GHG saving threshold is updated following the transposition of the ILUC Directive. The minimum GHG saving thresholds in Table 5 now apply. This means that renewable transport fuels produced in installations operating on or before 5 October 2015 must achieve at least a 50% GHG emissions saving for fuels supplied. Renewable transport fuels produced in newer installations which started operating after 5 October 2015 must deliver at least a 60% GHG emissions saving.

<table>
<thead>
<tr>
<th>Date production started at an installation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>On or before 05/10/2015</td>
<td>After 05/10/2015</td>
<td></td>
</tr>
<tr>
<td>50%</td>
<td>60%</td>
<td></td>
</tr>
</tbody>
</table>

Table 5 Minimum GHG saving thresholds and grandfathering periods for renewable fuel installations

NUTS2 (Article 19(3))

5.3 The ILUC Directive amended Article 19(3) of the RED on the use of default values and disaggregated default values. It is now permitted to report the relevant default for all types of biofuels, whether they are derived from wastes and residues, EU or non-EU crops.

5.4 Therefore, the previous restriction that - for biofuels derived from EU-grown crops - the relevant default values can only be used where cultivation emissions from the relevant NUTS2 region are below the relevant disaggregated default for cultivation no longer applies.

5.5 Suppliers can still use NUTS2 cultivation values when calculating actual carbon intensity values. For most EU 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 Commission Transparency Platform and included in the Carbon Calculator.

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63 Note that revised NUTS2 codes (NUTS2013) have come into effect from 1 January 2015. The revised codes are not expected to have a large impact on suppliers. Revised codes relate to both boundary changes and some new regions, and affect some feedstocks supplied from Greece, France, Slovenia and the UK (largely metropolitan areas). Some NUTS2 regions will now have the compliance status “unknown” until that Member State updates its NUTS2 report (http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels). Suppliers should report the new NUTS2 region codes from 1 January 2015 and are advised to check the Carbon Calculator for the new compliance status.

64 Nomenclature of territorial units for statistics, level-2: http://ec.europa.eu/eurostat/web/nuts/overview

65 Member State reports on Emissions from cultivation as required by Article 19(2) are available here: http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels. Data is also available in the /Kg feedstock metric here.
Demonstrating compliance with the GHG criteria

5.6 To demonstrate compliance with the RED GHG criteria suppliers of renewable fuel must be able to:

- report a carbon intensity of 41.9 gCO$_2$/MJ$^{66}$ (equivalent to a minimum 50% GHG emission saving) or less where produced in older renewable transport fuel installations that started operation on or before 5 October 2015;
- report a carbon intensity of 33.52 gCO$_2$/MJ (equivalent to a minimum of 60% GHG emission saving) where produced in newer renewable transport fuel installations that started operation after 5 October 2015$^{67}$;

5.7 A reporting party can demonstrate RED-compliance with the GHG criteria by using one or more voluntary schemes (see also the section on Voluntary schemes in Chapter 4 for guidance on their use).

5.8 Some of the voluntary schemes recognised by the Commission may be used to demonstrate compliance with the GHG criteria. Some voluntary schemes cover actual GHG calculations whilst others only cover the use of default values. Where the voluntary scheme only covers the use of default values it is still permitted to report a carbon intensity calculated using actual data; however, as this is not covered within the scope of the voluntary scheme this information is subject to verification. Even when compliance is recognised through a voluntary scheme, a carbon intensity value must still be reported.

Assessing the carbon intensity of your biofuel

5.9 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 to calculate an actual carbon intensity; or
- combining actual data with default input data or disaggregated default values.

5.10 This chapter outlines how to report the carbon intensity of your biofuel using the carbon defaults set out in Annex V of the RED.

5.11 Suppliers wishing to include actual data in the calculation of GHG emissions from their biofuels should follow the guidance in Chapter 6.

5.12 A free software tool is provided by the RTFO Administrator called the Carbon Calculator$^{68}$ 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.

$^{66}$ Note that the cut-off for compliance with the 50% GHG savings threshold is 41.9 gCO$_2$/MJ, but the carbon intensity can only be reported as a whole number on ROS. Therefore for biofuels where the calculated carbon intensity is 41.5-41.9 gCO$_2$/MJ, the reported carbon intensity should be rounded down and reported as 41 on ROS, not 42.

$^{67}$ The cut-off for compliance with the 60% GHG savings threshold is 33.52 gCO$_2$/MJ, but the carbon intensity can only be reported as a whole number on ROS. Therefore, for biofuels where the calculated carbon intensity is 33.0-33.52 gCO$_2$/MJ, the reported carbon intensity should be rounded down and reported as 33 on ROS, not 34.

$^{68}$ Note that the Carbon Calculator can also be used by economic operators in the Republic of Ireland reporting under the Irish Biofuel Obligation System. When prompted to select the reporting scheme upon opening the calculator, economic operators reporting under the RTFO should select “UK - Renewable Transport Fuel Obligation or Renewables Obligation”.
The RED GHG calculation methodology

5.13 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. Note that for aviation fuel, the methodology is a well-to-wing-tip approach.

The RED carbon defaults

5.14 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’).

5.15 All the fuel chain default values available for suppliers to report in the RED are ‘conservative’ i.e. they are designed to underestimate carbon savings rather than overestimate them. (See Chapter 6 for further details.)

5.16 Carbon default values are available in RED Annex V for:

- bioethanol, ETBE, MTBE and TAEE from sugar beet, sugar cane, wheat and EU produced corn (natural gas as process fuel in CHP plant);
- FAME biodiesel from oilseed rape, palm, soy beans, sunflower, used cooking oil and tallow (excluding category 3)\(^{69}\);
- hydrotreated biodiesel (dedicated processing only, not co-processed) from oilseed rape, palm, sunflower;
- biomethane (as CNG\(^{70}\)) from dry manure, wet manure and municipal organic waste;
- pure plant oil from oilseed rape.

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

5.18 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.

5.19 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.

5.20 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 renewable if this is given in the RED.

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\(^{69}\) UCO and tallow (excluding category 3 tallow) use the 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 Commission default value can be used.

\(^{70}\) Compressed natural gas.
Reporting using the fuel chain default values

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

5.21 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 values.

5.22 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:

- Where the carbon default does not meet the relevant GHG saving threshold.
- 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.

What type of default can be used?

5.23 There are two different types of fuel chain default values:

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

5.24 If the biofuel feedstock does not have a default value then actual data must be used for the entire fuel chain to determine the GHG emissions. 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 6).

<table>
<thead>
<tr>
<th>Feedstock default available in RED Annex V?</th>
<th>Process default available in RED Annex V?</th>
<th>Process known?</th>
<th>Type of default value</th>
<th>Default value table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Known or unknown</td>
<td>actual data must be used</td>
<td>n/a - see Chapter 6 for how to calculate actual GHG emissions</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>Known</td>
<td>Process</td>
<td>Table 8</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>Unknown</td>
<td>actual data must be used</td>
<td>n/a - see Chapter 6 for how to calculate actual GHG emissions</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Known or unknown</td>
<td>Feedstock</td>
<td>Table 7</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Known</td>
<td>Process</td>
<td>Table 8</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Unknown</td>
<td>Feedstock</td>
<td>Table 7</td>
</tr>
</tbody>
</table>

Table 6 Cross-reference to relevant default value tables

5.25 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 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 8).

5.26 This is summarised in Table 6 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.
Default value tables

5.27 Note that the figures in the tables are conservative and may not represent typical practice. Those defaults that do not meet the 50% GHG saving threshold are marked with an asterisk (note that fuels produced in newer installations that started operating after 5 October 2015 are required to comply with a higher 60% GHG saving threshold). Any carbon defaults added to Annex V of the RED within an obligation year will be added to the guidance and the detailed carbon intensity data spreadsheet available online.

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Feedstock</th>
<th>Carbon intensity (gCO₂e/MJ)</th>
<th>Carbon saving (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioethanol, ETBE(^{71}), TAEE(^{71,71})</td>
<td>Farmed wood</td>
<td>25</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Sugar beet</td>
<td>40</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Sugar cane</td>
<td>24</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Waste wood</td>
<td>22</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>70(^{*})</td>
<td>16(^{*})</td>
</tr>
<tr>
<td></td>
<td>Wheat straw</td>
<td>13</td>
<td>85</td>
</tr>
<tr>
<td>Biodiesel (Methyl Ester)</td>
<td>Oilseed rape</td>
<td>52(^{*})</td>
<td>38(^{*})</td>
</tr>
<tr>
<td></td>
<td>Palm</td>
<td>68(^{*})</td>
<td>19(^{*})</td>
</tr>
<tr>
<td></td>
<td>Soy</td>
<td>58(^{*})</td>
<td>31(^{*})</td>
</tr>
<tr>
<td></td>
<td>Sunflower</td>
<td>41</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>Tallow (except category 3)(^{72,73})</td>
<td>14</td>
<td>83</td>
</tr>
<tr>
<td>Biodiesel (UCO)</td>
<td>Used cooking oil(^{72})</td>
<td>14</td>
<td>83</td>
</tr>
<tr>
<td>Biodiesel (hydrotreated vegetable oil)</td>
<td>Oilseed rape</td>
<td>44(^{*})</td>
<td>47(^{*})</td>
</tr>
<tr>
<td></td>
<td>Palm</td>
<td>62(^{*})</td>
<td>26(^{*})</td>
</tr>
<tr>
<td></td>
<td>Sunflower</td>
<td>32</td>
<td>62</td>
</tr>
<tr>
<td>Biogas (biomethane)</td>
<td>Dry manure</td>
<td>15</td>
<td>82</td>
</tr>
<tr>
<td></td>
<td>Municipal organic waste</td>
<td>23</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Wet manure</td>
<td>16</td>
<td>81</td>
</tr>
<tr>
<td>FT diesel</td>
<td>Farmed wood</td>
<td>6</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>Waste wood</td>
<td>4</td>
<td>95</td>
</tr>
<tr>
<td>Pure plant oil</td>
<td>Oilseed rape</td>
<td>36</td>
<td>57</td>
</tr>
<tr>
<td>Methanol, MTBE(^{74})</td>
<td>Farmed wood</td>
<td>7</td>
<td>91</td>
</tr>
<tr>
<td></td>
<td>Waste wood</td>
<td>5</td>
<td>94</td>
</tr>
<tr>
<td>DME</td>
<td>Farmed wood</td>
<td>7</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>Waste wood</td>
<td>5</td>
<td>95</td>
</tr>
</tbody>
</table>

\(^{71}\) Renewable fraction only.

\(^{72}\) Tallow (except category 3) to biodiesel (TME) and used cooking oil to biodiesel (UCOME) 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.

\(^{73}\) 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. If the tallow is uncategorised (e.g. from outside the EU), the Commission default value can be used.
Table 7  Feedstock default values

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Feedstock</th>
<th>Process characteristic</th>
<th>Carbon intensity (gCO₂e/MJ)</th>
<th>Carbon saving (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioethanol, ETBE⁷⁴, TAE²⁷⁴</td>
<td>Corn (produced within the EU)⁷⁵</td>
<td>Natural gas a process fuel in CHP plant</td>
<td>43*</td>
<td>49*</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>Lignite as process fuel in CHP plant</td>
<td>70*</td>
<td>16*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Natural gas as process fuel in conventional boiler</td>
<td>55*</td>
<td>34*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Natural gas as process fuel in CHP plant</td>
<td>44*</td>
<td>47*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Straw as process fuel in CHP plant</td>
<td>26</td>
<td>69</td>
</tr>
<tr>
<td>Biodiesel (Methyl ester)</td>
<td>Palm</td>
<td>Methane capture at oil mill</td>
<td>37</td>
<td>56</td>
</tr>
<tr>
<td>Biodiesel (Hydrotreated vegetable oil)</td>
<td>Palm</td>
<td>Methane capture at oil mill</td>
<td>29</td>
<td>65</td>
</tr>
</tbody>
</table>

Table 8  Process default values

What to do if there is no appropriate default value

5.28 There may be 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.

5.29 At the time of publishing this guidance, the Commission has not specified the process by which default values will be developed for new fuel chains.

5.30 In the absence of a suitable default value, a supplier must calculate the carbon intensity of the fuel from actual data.

5.31 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.

NUTS2⁷⁶ (Article 19(3))

5.32 The ILUC Directive amended Article 19(3) of the RED on the use of default values and disaggregated default values. It is now permitted to report the relevant default for all types of biofuels, whether they are derived from wastes and residues, EU or non-EU crops.

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⁷⁴ Renewable fraction only.
⁷⁵ Note that for biofuel derived from corn cultivated within the European Union 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.
5.33 Therefore, the previous restriction that - for biofuels derived from EU-grown crops - the relevant default values can only be used where cultivation emissions from the relevant NUTS2 region are below the relevant disaggregated default for cultivation no longer applies.

5.34 Suppliers can still use NUTS2 cultivation values when calculating actual carbon intensity values.

5.35 For most EU 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 Commission Transparency Platform. 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 their website. Changes to existing NUTS2 data will apply as soon as it is published on the Commission website and applies to any biofuel supplied from that point forwards.

Assessing the carbon intensity of a RFNBO

5.36 For RFNBOs suppliers must calculate and report actual GHG emissions from RFNBOs using the methodology set out in Chapter 6.

5.37 The Commission has powers to adopt delegated acts to set default GHG emission values for RFNBOs and carbon capture and utilisation under the amended RED.

5.38 When these become available, it is anticipated that changes will be made to the RTFO Order to enable suppliers to report these default values.

Calculating the GHG saving of a renewable fuel

5.39 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 CO$_2$e/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 renewable fuel displaces one megajoule of fossil fuel.

5.40 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 gCO$_2$e/MJ.

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

---

77 Member State reports on Emissions from cultivation as required by Article 19(2) are available here: [http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels](http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels). At present, not all EU NUTS2 reports have been submitted and accepted by the Commission.
Calculation of direct renewable fuel GHG saving

GHG saving = (CI of FF displaced - CI of biofuel)/CI of FF displaced x 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

GHG saving = (83.8 - 40)/83.8 x 100 = 52%

Aggregating consignments with different carbon intensities

5.42 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 8 are followed. Note that there are specific rules with respect to the GHG data which must be adhered to.
6. Reporting actual Greenhouse Gas data and assessing land-use change impact

Chapter summary
This chapter provides guidance on using actual data to determine the GHG savings of renewable fuels.
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 or to RFNBOs.

Calculating biofuel 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 BioGrace 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 should also be used for feedstocks for which there is no default available in RED Annex V.

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.

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

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78 The RTFO Administrator and the EU BioGrace project have developed a breakdown of the RED disaggregated defaults into their component input data.
79 The Carbon Calculator and accompanying spreadsheets are official tools supplied by the RTFO Administrator to aid GHG calculations. 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.
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).

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 renewable, and take into account only the renewable feedstock. The emissions from the non-renewable part of the partially renewable fuel, do not need to be taken into consideration for the purposes of the RTFO.80

6.7 For ETBE, TAEE and MTBE, the RED states that the GHG emissions from the finished fuel are equal to that of the ethanol or methanol production pathway used. 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.

6.8 For all other partially renewable fuels the GHG emissions must be calculated for the renewable portion as they are calculated for fuels which are wholly renewable.

6.9 When presenting actual value calculations reporters may, if they wish, separate out the constituent elements of the GHG calculation (e.g. \( \epsilon_{ec}, \epsilon_{ed}, \epsilon_{el}, \epsilon_{sca}, \epsilon_{ccr} \)) as recommended in the Commission’s advice to biofuel voluntary schemes on GHG calculation methodology published in June 2015.

**Structure of the default fuel chains**

6.10 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.

6.11 The default fuel chains are constructed by arranging common modules into a series of sequential stages. Figure 1 shows the common modules (and their corresponding stages) which make up every fuel chain and Figure 2 illustrates how they can be arranged into a fuel chain. These common modules are described in Table 9.

6.12 Note that the depot and filling station (and the transport between those) are typically beyond the duty point, that is, the point at which the owner of the biofuel (the reporting party) reports C&S data to the Administrator.

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80 The exception is for fuels that are part RFNBO, part non-RFNBO, e.g. H2 generated from a mix of solar and coal electricity. This category of partially renewable fuel does not have feedstock consignments (and the feedstock water or CO2 is neither renewable or non-renewable, because they have no energy). Hence all volumes of the fuel are assigned the same GHG intensity. In this case, the emissions from the non-renewable part of the process energy inputs do impact the fuel GHG intensity.

Figure 1 Modules used to define a biofuel chain

Figure 2 Example of fuel chain defined using common modules (OSR = oilseed rape)

<table>
<thead>
<tr>
<th>Module name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivation of raw materials</td>
<td>Growing a biofuel feedstock (e.g. palm, wheat, soy etc). Cultivation includes harvesting.</td>
</tr>
<tr>
<td>Drying and storage</td>
<td>Drying and storage of biofuel feedstocks (where this is done outside of a biofuel conversion plant).</td>
</tr>
<tr>
<td>Conversion</td>
<td>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).</td>
</tr>
<tr>
<td>Transport</td>
<td>Transport of a primary, intermediary or final product (e.g. transport of liquid biofuel from a biofuel conversion plant to a refinery).</td>
</tr>
<tr>
<td>Depot</td>
<td>Road fuel depot station.</td>
</tr>
<tr>
<td>Filling</td>
<td>Road fuel filling station.</td>
</tr>
</tbody>
</table>

Table 9 Description of the modules constituting a biofuel fuel chain
Default input data

6.13 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 project\(^2\). These should be used in supplier's GHG calculations where they are available. The BioGrace standard values are available on the BioGrace website. The Commission's GHG methodology note to biofuel voluntary schemes highly recommends that operators use these standard values in their reporting.

Focus for data collection

6.14 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 10 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.

6.15 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 fuel chain carbon emissions\(^3\). 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 11). For RFNBOs see also section 6.84.

<table>
<thead>
<tr>
<th>Step in the supply chain</th>
<th>Focus for data collection/ GHG reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop production</td>
<td>Agro-chemical application rate (e.g. nitrogen fertiliser)</td>
</tr>
<tr>
<td></td>
<td>Crop yield and moisture content</td>
</tr>
<tr>
<td></td>
<td>Fuel consumption for cultivation</td>
</tr>
<tr>
<td>Drying and storage</td>
<td>Fuel type (e.g. diesel) or electricity consumption for drying</td>
</tr>
<tr>
<td>Feedstock and liquid fuel transport</td>
<td>Transport distances</td>
</tr>
<tr>
<td>Conversion - e.g. biofuel conversion or</td>
<td>Yield(^4)</td>
</tr>
<tr>
<td>oilseed crushing</td>
<td>Fuel type (e.g. natural gas, fuel oil, coal) and demand</td>
</tr>
<tr>
<td></td>
<td>Electricity demand</td>
</tr>
<tr>
<td></td>
<td>Chemical inputs</td>
</tr>
<tr>
<td></td>
<td>Co-product yield and energy content</td>
</tr>
<tr>
<td></td>
<td>Electricity demand</td>
</tr>
<tr>
<td></td>
<td>Chemical inputs</td>
</tr>
<tr>
<td></td>
<td>Co-product yield and energy content</td>
</tr>
</tbody>
</table>

Table 10  Aspects of the biofuel chain which most affect the carbon intensity

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\(^2\) The RTFO Administrator and the EU [BioGrace project](https://bio grace.eu) have developed a breakdown of the RED disaggregated defaults into their component input data.

\(^3\) 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.

\(^4\) i.e. tonnes of product (e.g. biodiesel) per tonne of input (e.g. rapeseed oil).
Rules governing the use of actual data

6.16 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.

Which actual data should be included?

6.17 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; from origin of the biofuel to the filling station.

6.18 Although the road fuel depot and filling stations (and associated transport) are beyond the duty point, emissions from these steps must still be included. However, as the reporting party is unlikely to have influence over the GHG emissions associated with these steps or be able to collect the data (as they may no longer own the biofuel) it is permitted to use default GHG data for these steps from the Carbon Calculator.

6.19 It is not necessary to have actual data for all sources of emissions: for feedstocks that have defaults in Annex V of the RED and have been replicated in the Carbon Calculator it is possible to use a combination of actual data and default input data in the GHG calculation (taking into account compulsory linkages -see Table 11).

6.20 For feedstocks which do not have a carbon default, actual data must be used for the entire fuel chain.

6.21 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. 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

6.22 There are several input fields within a carbon intensity calculation that are interdependent. For example, crop yield is influenced by the amount of nitrogen applied. To avoid the possibility of default values being used in an inappropriate fashion a number of 'compulsory linkages' have been defined (Table 11).

6.23 If actual data is used for one of the two inputs listed in Table 11 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.

Validity of actual data over time

6.24 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.

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85 See Default input data section below.
Actual data for crop production

6.25 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).

6.26 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 Commission website. Where possible, this data has also been included in the Carbon Calculator.

6.27 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. Countries outside the EU are now able to submit national reports of NUTS2-equivalent level cultivation data to the Commission. Where such reports have been accepted by the Commission, suppliers are able to use the data as regional cultivation data in the same way as NUTS2 data in the EU.

6.28 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.

6.29 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.

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86 Member States’ reports are available here: [http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels](http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels) Data is also available in the /Kg feedstock metric here.
6.30 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**

6.31 Suppliers should be aware that a conservative factor is applied to the default processing step. In the calculation of the disaggregated default values, the Commission took a conservative approach by applying a multiplier of 1.4 to the processing step, thereby increasing emissions from processing.

6.32 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.

6.33 This rule applies to each conversion module individually in the case that there is more than one.

**Default input data**

6.34 Suppliers should use the values provided in the detailed carbon intensity spreadsheet in their GHG calculations.

**Reporting the type of GHG data**

6.35 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.

6.36 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.

6.37 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.

6.38 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 GHG saving threshold).
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.

6.39 If a supplier uses the Carbon Calculator to report actual data to the RTFO Administrator, 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.

6.40 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.

6.41 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**

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

6.43 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).

6.44 The input data lying behind these selected default options are being harmonised across the EU through the BioGrace project\(^87\), which has been recognised by the Commission as a voluntary scheme. 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.

\(^{87}\) [www.biograce.net](http://www.biograce.net)
What selected default options are available?

<table>
<thead>
<tr>
<th>Stage</th>
<th>Module</th>
<th>Input</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivation</td>
<td>Crop production</td>
<td>NUTS2 regional cultivation data</td>
<td>For the regions where this is available, the cultivation emissions for the region for a particular feedstock can be included(^{88})</td>
</tr>
<tr>
<td>Cultivation</td>
<td>Drying and storage</td>
<td>Fuel emissions factor</td>
<td>Diesel, heavy fuel oil, coal, natural gas</td>
</tr>
<tr>
<td>Conversion</td>
<td>Conversion</td>
<td>Fuel emissions factor</td>
<td>Coal, natural gas, heavy fuel oil, biomass, lignite</td>
</tr>
<tr>
<td>Conversion</td>
<td>Conversion</td>
<td>Chemicals</td>
<td>N-hexane, phosphoric acid, Fuller's earth, hydrochloric acid, sodium carbonate, sodium hydroxide, potassium hydroxide, hydrogen, pure CaO, sulphuric acid, ammonia, cyclohexane, lubricants</td>
</tr>
<tr>
<td>Transport  &amp; distribution</td>
<td>Transport</td>
<td>Transport mode fuel efficiency</td>
<td>Truck (by geographic region), rail (by geographic region), shipping</td>
</tr>
</tbody>
</table>

Table 12 Selected default options within each module

6.45 The following qualitative parameters can be changed by transport biofuel suppliers to calculate the appropriate selected carbon default values (Table 12):

- 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.

Use of NUTS2 cultivation emissions as a default option

6.46 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 on the use of NUTS2 data.

6.47 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).

6.48 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).

\(^{88}\) Selecting the appropriate NUTS2 region in the Carbon Calculator enables the emissions from cultivation for that feedstock from that region to be automatically included.
Editing pre-defined (default) fuel chains with actual input data or selected default options

6.49 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.

6.50 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.).

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

6.52 Note that there are two fuel chains (waste animal/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 missing.

6.53 Table 13 outlines the procedure for editing a default fuel chain.

<table>
<thead>
<tr>
<th>Step</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1:</td>
<td>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 User Manual. If the calculations are performed using an Excel workbook, refer to the Excel carbon intensity templates spreadsheet.</td>
</tr>
<tr>
<td>Step 2:</td>
<td>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.</td>
</tr>
<tr>
<td>Step 3:</td>
<td>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. 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 1.491. 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. 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 89 This includes all tallow, except category 3 tallow. 90 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. 91 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.</td>
</tr>
</tbody>
</table>
module. Instead, the known carbon intensity value should be inserted directly into the 'Fuel Chain Summary' table - see Step 5. 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).

**Step 4:** 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.

**Step 5:** 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.

**Step 6:** 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. In the Carbon Calculator, the new fuel chain carbon intensity will appear by clicking on the Fuel Chain module (see the Carbon Calculator User Manual for more information).

**Step 7:** 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). 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 User Manual for more information).

Table 13 Procedures for editing a default fuel chain with actual data or selected default options

**Providing actual data on co-products**

6.54 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 14. 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 calculations.
- 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.

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92 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.
93 Note that when calculating the GHG emission of crop residues they have zero emissions only up to the point of process of collection.
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>
<thead>
<tr>
<th>Approach</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System</td>
<td>Description</td>
</tr>
<tr>
<td>expansion</td>
<td>Step 1: Identify the amount of excess electricity being co-generated with the amount of heat used in the module94.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>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 cogeneration unit. See the Carbon Calculator User Manual for further explanation.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
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</tbody>
</table>

94 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.
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 User Manual 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\(^95\)) 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\(^96\).

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 3: Divide the energy of a tonne of biofuel product by the total energy of all 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.

Table 14 Procedure for editing a default fuel chain with actual data on co-products

### Emission savings from carbon capture and storage/replacement

6.55 The GHG calculation methodology set out in Annex V.C of the RED allows for the inclusion of emission savings from carbon capture and storage (\(\epsilon_{\text{ccs}}\)) and emission savings from carbon capture and replacement (\(\epsilon_{\text{ccr}}\)).

6.56 The RED sets out that emission savings from carbon capture and replacement, \(\epsilon_{\text{ccr}}\), shall be limited to emissions avoided through the capture of CO\(_2\) of which the carbon originates from biomass and which is used to replace fossil-derived CO\(_2\) used in commercial products and services. Emission savings from carbon capture and geological storage (\(\epsilon_{\text{ccs}}\)) that have not already been accounted for in emissions from processing (\(\epsilon_p\)), shall be limited to emissions avoided through the capture and sequestration of emitted CO\(_2\) directly related to the extraction, transport, processing and distribution of fuel.

6.57 The Commission’s note on GHG calculation methodology emphasises that, for both elements, the emissions saved must relate directly to the production of the biofuel they are attributed to. It would for instance not be justified to allocate different amounts of savings to biofuels obtained from the same process i.e. all biofuels originating from the same process would need to be treated equally in this regard.

\(^95\) The lower heating value should include the entire co-product i.e. not only the dry fraction

\(^96\) The co-product energy contents are taken from the BioGrace spreadsheet 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.
Capturing emissions has its own GHG emission footprint. Therefore, all emissions related to the capturing are required to be accounted for in the calculation.

6.58 To gain a credit for the CO\textsubscript{2} capture the reporter must demonstrate that the captured CO\textsubscript{2} is used in commercial products and services to replace fossil-derived CO\textsubscript{2}. In demonstrating this, the Commission note on GHG methodology states that it would suffice to verify that the CO\textsubscript{2} was sold to an economic operator that can reasonably be expected to make direct use of the CO\textsubscript{2} and has declared in writing that the purchased CO\textsubscript{2} will replace use of fossil-derived CO\textsubscript{2} and this will lead to emission savings.

**Making adjustments to the structure of existing fuel chains**

6.59 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**

6.60 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.

6.61 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.

6.62 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.

6.63 The procedure for removing a module is outlined in Table 15.

<table>
<thead>
<tr>
<th>Step</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1:</td>
<td>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 User Manual. If the calculations are performed using an Excel workbook, refer to the Excel carbon intensity templates spreadsheet.</td>
</tr>
</tbody>
</table>
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 User Manual).

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 User Manual 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 User Manual for more information).

Table 15 Procedure for removing a module

Adding a module

6.64 With the exception of crop production, the modules listed in Table 9 can be added to an existing default fuel chain. Table 10 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.

6.65 Every module must include two totals: the module total (kgCO₂e/t product\(^{97}\)); 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.

6.66 Table 16 outlines the procedure for adding a module.

\(^{97}\) 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.
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 User Manual. 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).
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 User Manual).

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 User Manual 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 User Manual for more information).

Table 16 Procedure for adding a module

Building a new fuel chain

6.67 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.

6.68 The procedure of building a new fuel chain is outlined in Table 17.
### Step 1: Define the steps which occur during the production of a biofuel using the modules shown in Figure 1. If the Carbon Calculator is used, upload the appropriate modules and create the link between them as explained in the User Manual.

### 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 3: Within each module, identify all sources of GHG emissions which will influence the final 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: The new fuel chain carbon intensity can be calculated by adding up the contribution of all the different modules. In the Carbon Calculator, the new fuel chain carbon intensity appears by clicking on the Fuel Chain module (see the Carbon Calculator User Manual 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 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 User Manual for more information).

Table 17 Procedure for building a new fuel chain

**What to do if no standard value is available**

6.69 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 Commission. 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 RED:

- the standard value should be obtained from independent, scientifically expert sources;
- the standard value should be updated as those sources progress their work.

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98 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 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 Commission or the JRC will produce a new standard emission factor, if at all.

99 These criteria are set out in paragraph 83 of the introduction to the RED.
Calculating a RFNBO carbon intensity based on actual data

6.70 The GHG methodology for the calculation of the carbon intensity of a renewable fuel of non-biological origin (RFNBO) has been adapted from the GHG calculation methodology for biofuels laid out in Annex V of the RED.

6.71 GHG emissions from the production and use of RFNBOs shall be calculated as:

\[ E = e_{ec} + e_p + e_{td} + e_u - e_{ccs} - e_{ee} \]

Where:

- \( E \) = total emissions from the use of the fuel;
- \( e_{ec} \) = emissions from the extraction or collection of raw materials;
- \( e_p \) = emissions from processing;
- \( e_{td} \) = emissions from transport and distribution;
- \( e_u \) = emissions from the fuel in use;
- \( e_{ccs} \) = emission saving from carbon capture and geological storage;
- \( e_{ee} \) = emission saving from excess electricity from cogeneration.

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

6.73 GHG emissions from fuels, \( E \), shall be expressed in terms of grams of CO\(_2\) equivalent per MJ of fuel, gCO\(_2\)/MJ.

6.74 As stipulated in the RED, the greenhouse gases taken into account for the purposes of the calculation in paragraph 7.69 shall be CO\(_2\), N\(_2\)O and CH\(_4\). For the purpose of calculating their CO\(_2\) equivalence, those gases shall be valued as follows:

- CO\(_2\) : 1
- N\(_2\)O : 296
- CH\(_4\) : 23

6.75 Emissions from the extraction or collection of raw materials, \( e_{ec} \), include emissions from the extraction process itself; from the collection of raw materials; from waste and leakages; and from the production of chemicals or products used in extraction or collection of the raw materials (this includes the additional energy and chemicals used in any carbon capture).

6.76 Water, biogenic CO\(_2\), atmospheric CO\(_2\) and naturally occurring/geothermal CO\(_2\) are considered to have zero lifecycle greenhouse gas emissions up to the process of collection of these materials. Where naturally occurring or geothermal CO\(_2\) sources are utilised, evidence must be provided to the Administrator that these emission sources have not been increased by the extraction of the CO\(_2\), or that any additional emissions have been included within the extraction emissions, \( e_{ec} \). Where biogenic CO\(_2\) sources are utilised, evidence should be provided to the Administrator that this CO\(_2\) is not already being used to claim a GHG credit in the original bioenergy supply chain, and would otherwise have been emitted to atmosphere\(^{100}\).

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\(^{100}\) For example, a biofuels producer cannot claim that any biogenic CO\(_2\) used to make a RFNBO constitutes an "emission saving from carbon capture and replacement" within their own biofuel supply chain GHG calculation. This would be an erroneous double claim of GHG savings between biofuel and RFNBO supply chains. Due to their consumption and emission to atmosphere, RFNBOs also do not count as an "emission saving from carbon capture and geological storage" in the biofuels calculation.
6.77 Suppliers should inform the Administrator if they plan on using naturally occurring, geothermal or biogenic CO₂ sources and the Administrator will define what evidence is required to demonstrate compliance with the criteria in 6.76.

6.78 Waste fossil CO₂ is also considered to have zero lifecycle greenhouse gas emissions up to the point of collection, provided these materials meet the definition of a waste (as per Article 2 (p) of the ILUC Directive), evidence is provided that the carbon in these materials would have otherwise been emitted to atmosphere, and provided the facility generating these waste materials does not claim a reduction in their emissions due to this use of the waste fossil CO₂.

6.79 If the waste fossil generating facility does wish to claim a reduction in their emissions, then these GHG emissions instead need to be assigned to the waste fossil material and contribute to eec, in line with the material’s global warming potential (e.g. one tonne of waste fossil CO₂ would be assigned 1 tCO₂e/tonne).

6.80 If the waste fossil generating facility does wish to claim a reduction in their emissions, then these greenhouse gas emissions instead need to be assigned to the waste fossil material used to produce the RFNBO and must contribute to eec, in line with the material’s global warming potential (e.g. one tonne of waste fossil CO₂ would be assigned 1 tCO₂e/tonne). Similarly, if the carbon in the material would not otherwise have been emitted to atmosphere (e.g. waste fossil plastic might have sequestered its carbon for centuries in landfill, or as a building insulation material), then the additional greenhouse gas emissions from this avoided sequestration also need to be assigned to the waste fossil material and contribute to eec.

6.81 If a supplier wishes to carry out either of the practices outlined in 6.81 they should contact the Administrator for further guidance.

6.82 Emissions from processing, eₚ, include emissions from the processing itself; from waste and leakages; and from the production of chemicals or products used in processing.

6.83 In accounting for the consumption of electricity not produced within the fuel production plant, the greenhouse gas emission intensity of the production and distribution of that electricity shall be assumed to be equal to the average emission intensity of the production and distribution of electricity in that country as measured two years before the year in question. By derogation from this rule, producers may use an average value for an individual electricity production site for electricity produced by that site if it falls under the derogations listed in 3.43 in the Process Guidance.

6.84 Where renewable energy is displaced from the wider grid, it is expected that the shortfall will be met by additional production from a combination of sources, including fossil fuels. Therefore, the supplier must account for any GHG emissions that arise from the displacement of renewable energy from the wider grid. In these instances it is assumed that the grid average emissions intensity should apply to the amount of displaced renewable energy used by the fuel production plant. Suppliers may provide evidence with actual data to overturn this presumption.

6.85 Examples of actual data include, but are not limited to records of historical generation from the electricity production site (where applicable), planning proposals for new sites that will be constructed at the same time or after the RFNBO plant (where

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101 For example, from a desire to reduce their costs under the EU’s Emission Trading Scheme, or other national taxes on emissions. The waste fossil generating facility cannot claim a GHG savings whilst the RFNBO manufacturer also claims a low carbon fuel is being made, as this would be an erroneous double claim of only one set of GHG savings - since the original fossil carbon is still ultimately ending up in the atmosphere.
applicable), evidence of curtailment, or details of what measures are set in place to address any shortfall incurred.

6.86 Emissions from transport and distribution, \( e_{td} \), includes emissions from the transport and storage of raw and semi-finished materials, wastes and leakages, and from the storage and distribution of finished materials. Emissions from transport and distribution to be taken into account under \( e_{td} \) shall not be covered by this point.

6.87 Emissions from the fuel in use, \( e_u \), shall be taken to be zero for renewable liquid and gaseous transport fuels of non-biological origin.

6.88 Emission saving from carbon capture and geological storage \( e_{ccs} \), that have not already been accounted for in \( e_o \), shall be limited to emissions avoided through the capture and sequestration of emitted \( CO_2 \) directly related to the transport, processing and distribution of fuel. The capture of any \( CO_2 \) at the start of the fuel chain, i.e. the collection of raw materials used to manufacture the assessed fuel, cannot be included within this \( e_{ccs} \) emission saving – nor can any recycling of captured \( CO_2 \) within the fuel chain – as these are not sequestration activities.

6.89 Emission saving from excess electricity from cogeneration, \( e_{ee} \), shall be taken into account in relation to the excess electricity produced by fuel production systems that use cogeneration. 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. The greenhouse gas emission saving associated with that excess electricity shall be taken to be equal to the amount of greenhouse gas that would be emitted when an equal amount of electricity was generated in a power plant using the same fuel as the cogeneration unit.

**Allocating emissions to co-products**

6.90 Where a fuel production process produces, in combination, the fuel for which emissions are being calculated and one or more other products (co-products), greenhouse gas emissions shall be divided between the fuel or its intermediate product and the co-products in proportion to their energy content (determined by lower heating value in the case of co-products other than electricity).

6.91 For the purposes of the calculation referred to in section 6.89, the emissions to be divided are \( e_{ee} + \) those fractions of \( e_p, e_{td} \) and \( e_{ee} \) that take place up to and including the process step at which a co-product is produced. If any allocation to co-products has taken place at an earlier process step in the life-cycle, the fraction of those emissions assigned in the last such process step to the intermediate fuel product shall be used for this purpose instead of the total of those emissions.

6.92 In the case of renewable liquid and gaseous transport fuels of non-biological origin, all co-products shall be taken into account for the purposes of that calculation. Co-products that have a negative energy content are considered to have an energy content of zero for the purpose of the calculation.

6.93 In the case of fuels produced in refineries, the unit of analysis for the purposes of the calculation referred to in section 6.89 is the refinery.
Calculating a GHG intensity of part RFNBO, part non-RFNBO fuels from actual data

6.94 When a RFNBO is produced using a mixture of renewable and non-renewable process energy, the resulting fuel is a part RFNBO, part non-RFNBO. As this fuel does not have discrete volumes that are renewable or non-renewable, to determine how much of that fuel is eligible for RTFCs the volume of the fuel is split into a 'fossil' (non-RFNBO) and a 'renewable' (RFNBO) element (see Process Guidance).

6.95 Unlike partially renewable biofuels that have two separate GHG emissions values, the GHG calculation methodology for RFNBOs is different. The RFNBO and non-RFNBO fractions of the fuel are required to take the same GHG intensity value (due to sharing the process energy inputs during the consignment time period). This should be calculated according to the methodology laid out above for RFNBOs, with ep (emissions from process energy) including all process energy going into the plant, including the non-renewable portion.

6.96 If a RFNBO plant uses electricity from the grid as processing energy, and does not qualify for any of the derogations under point 6.84, then the average grid emissions factor is used to calculate the GHG emissions of both the renewable and non-renewable portion of the fuel produced.

Methodology for reporting land-use change emissions

Introduction

6.97 The sections below set out the rules for GHG emission calculations due to land-use change. The Commission has published an annotated example of such emissions calculations which can be downloaded from the Commission website.

6.98 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.

6.99 The impact of land-use change is not applicable to biofuels derived from wastes and non-agricultural residues.

Calculation of land-use change emissions

6.100 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 gCO\(_2\)/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
- \( P \) is the productivity of the crop (in MJ/ha)
- \( e_B \) is a bonus of 29 gCO\(_2\)/MJ if the biofuel feedstock is obtained from restored degraded land - see Table 4.

**Calculation of carbon stock**


6.102 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)

6.103 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).

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6.104 Definitions of the different land-use categories for determining previous land-use are provided in Table 4. 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 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.

6.105 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.

6.106 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**

6.107 Parties may use several methods to determine soil organic carbon, including measurements\(^{104}\). When measurements are not used, the method used shall take into account climate, soil type, land cover, land management and inputs.

6.108 As a default method, the following equation can also be used.

**Equation 3: Soil organic carbon**

\[
SOC = SOC_{ST} \times F_{LU} \times F_{MG} \times F_{I}
\]

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 standard soil organic carbon (no unit).

6.109 \(SOC_{ST}\) can be looked-up in Table 1 of Commission Decision 2010/335/EU\(^{103}\) 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 Platform\(^{105}\). The soil type can be determined by following the flow diagram on page 12 of the Commission Decision 2010/335/EU\(^{103}\) or following the soil type data layers also available from the Transparency Platform.

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\(^{104}\) 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).

6.110 \( F_{LU}, F_{MG} \) and \( F_{I} \) can be looked-up in Tables 2 to 8 of Decision 2010/335/EU depending on climate region, land use, land management and input.

**Soil organic carbon - organic soils (histosols)**

6.111 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.

6.112 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**

6.113 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 \( CS_{A} \).

6.114 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**

6.115 For some vegetation types, \( C_{VEG} \) can be directly read from Tables 9 to 18 of Commission Decision 2010/335/EU.

6.116 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 \( (C_{BM} \text{ in gC/ha}) \) and above and below ground carbon stock in dead organic matter \( (C_{DOM} \text{ in gC/ha}) \). For \( C_{DOM} \) the value of 0 may be used, except 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**

\[
C_{BM} = B_{AGB} \times CF_{B} + B_{BGB} \times CF_{B} \\
\text{Or} \\
C_{BM} = (B_{AGB} \times CF_{B}) \times (1+R)
\]

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

\[ C_{\text{DOM}} = \text{DOM}_{\text{DW}} \times \text{CF}_{\text{DW}} + \text{DOM}_{\text{LI}} \times \text{CF}_{\text{LI}} \]

Where:

- \( \text{DOM}_{\text{DW}} \) is the weight of dead wood pool (in kg dry matter/ha);
- \( \text{CF}_{\text{DW}} \) is the carbon fraction of dry matter in dead wood pool (in kgC/kg dry matter);
- \( \text{DOM}_{\text{LI}} \) is the weight of litter (in kg dry matter/ha);
- \( \text{CF}_{\text{LI}} \) is the carbon fraction of dry matter in litter (in kgC/kg dry matter).

These values are determined as follows:

- \( B_{\text{AGB}} \) shall be the average weight of the above ground living biomass during the production cycle for cropland, perennial crops and forest plantations;
- \( \text{CF}_{\text{B}} = 0.47 \)
- \( B_{\text{BGB}} \) 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
- \( \text{CF}_{\text{DW}} = 0.5 \)
- \( \text{CF}_{\text{LI}} = 0.4 \)

**Degraded land bonus**

6.117 The Commission is currently working on a refined definition of severely degraded and heavily contaminated land. If the regulation is agreed, the Guidance will be amended accordingly, although there are no agreed timings at present. Until further guidance is issued, no biofuel will be eligible for the degraded land bonus.

6.118 Biofuel feedstocks cultivated on degraded land will be eligible to receive a GHG bonus of 29 gCO\(_2\)e/MJ biofuel. 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) are ensured and that soil contamination is reduced for heavily contaminated land (definition (b) in Table 4).
7. Indirect Land Use Change value reporting

Chapter summary
This chapter contains information on how the Administrator will collect and report information on Indirect Land Use Change (ILUC) values from land-based biofuels.

7.1 ILUC is land-use change where the cause is at least a step removed from the effects. It is the 'knock-on' effect on expansion of agricultural land use resulting from the cultivation of biofuel feedstocks.

7.2 Estimations of the effects of ILUC derived from economic modelling - known as 'ILUC values' - suggest that some crop derived biofuels can lead to an increase rather than a decrease in carbon emissions. According to the ILUC values in the amended RED, when ILUC is included crop derived biodiesel can increase carbon emissions compared to fossil fuels, whilst the GHG savings for crop derived bioethanol are more modest than previously estimated.

7.3 To help tackle ILUC, the RTFO Order has been amended to encourage the supply of fuel created from the most sustainable feedstocks through the introduction of a development fuels target that takes into account both the fuel type and the feedstock, as well as setting a maximum amount of crop based biofuels. More information on the development fuel target and the crop cap can be found in the Process Guidance.

7.4 The ILUC Directive amendments to the RED require ILUC values from land-based (crop) biofuels be included by Member States in their reports to the Commission. This will be facilitated by the RTFO Administrator.

7.5 In addition to the existing sustainability reporting requirements in this Guidance, the Administrator will also now gather information on estimated ILUC emissions from land-based (crop) biofuels. The information will be automatically calculated by our IT system based on the feedstock information already reported by suppliers.

7.6 The ILUC values used by the Administrator are the mean values provided in Annex VIII Part A of the amended RED, see Table 18 below. The mean values represent a weighted average of the individually modelled feedstock values. The mean values are given for groups of feedstocks including cereals and other starch rich crops, sugars, and oil crops.
<table>
<thead>
<tr>
<th>Feedstock group</th>
<th>ILUC values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals and other starch-rich crops</td>
<td>12</td>
</tr>
<tr>
<td>Sugars</td>
<td>13</td>
</tr>
<tr>
<td>Oil crops</td>
<td>55</td>
</tr>
</tbody>
</table>

Table 18 Provisional estimated ILUC emissions from biofuel and bioliquid feedstocks (gCO₂eq/MJ) from the amended RED

7.7 Estimated ILUC emissions are considered to be zero in the following situations:
- For feedstocks that are not listed in Table 18; or
- If there has been a (RED-compliant) direct land use change (see Chapter 6).

7.8 Suppliers must contact the Administrator before making an application in relation to fuel where the ILUC emissions are considered to be zero due to one of the situations detailed above. This is to help ensure that the correct requirements and values are applied.

7.9 Suppliers should note that, under the FQD and amended GHG Reporting Regulations, suppliers must report ILUC values for any biofuels used towards their targets. See the *GHG Reporting Regulations* guidance.
8. 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 to demonstrate that the biofuel supplied meets the sustainability criteria. This chapter outlines acceptable chain of custody systems and provides guidance on setting up a mass balance chain of custody system where none exists.

The principles of mass balance of chain of custody as laid out in this chapter also apply to RFNBOs.

Guiding principles

8.1 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.

8.2 It is the reporting party's responsibility to ensure that appropriate chains of custody are in place to the origin of the material, and that mass balance systems are being implemented correctly. The chain of custody is subject to verification.

8.3 It is the responsibility of each supplier in the chain of custody to keep records and evidence to demonstrate that the chain of custody has operated correctly. Where necessary, verifiers and the Administrator may require access to these records and evidence. Although it is not necessary for evidence to be passed along the chain of custody, it must be available for review by the verifier or Administrator if required. Descriptions of the types of evidence which may be available can be found in Chapter 10 - Demonstrating compliance: evidence requirements.

8.4 Suppliers should be aware of the letter\textsuperscript{106} to voluntary schemes published by the Commission, dated 10 October 2014. The letter gives additional guidance that should be followed by voluntary schemes regarding the chain of custody approach for all wastes and residues, and which is especially relevant in the case of UCO. The guidance in this letter is in line with the requirements already described in the RTFO and voluntary schemes may now be expected to update their approaches to be in line with the Commission guidance.

8.5 The key points in the letter include:

• Traceability of wastes and residues needs to cover the whole chain of custody, going back to the origin of the material, i.e. where the waste or residue material arises;

• A group auditing approach is only permitted at the origin of the material;

• The frequency and intensity of the auditing procedure needs to reflect the level of risk;

• Auditors should have the right to do on-site audits at the origin (e.g. restaurants) if required;

• Economic operators need to declare to auditors the name of all voluntary schemes they operate in and make available all relevant information, e.g. full mass balance records for a site.

Terminology

8.6 Throughout this chapter the following terminology will be used:

• Origin: the farm or plantation where the crop was grown or the site/facility/premises which first generated the waste or residue. The origin of UCO, for example, is the restaurant or food processing facility where the oil was used, not the biofuel processing plant or where the UCO is aggregated.

• Country of origin: the country in which the ‘origin’ is located. This is NOT the country where the biofuel was produced, i.e. the biofuel processing plant.

• Input: any physical input sourced by any party in the supply chain, e.g. 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, e.g. 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, e.g. 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 C&S characteristics reported to the RTFO Administrator, an equivalent amount of feedstock with the same C&S 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;
  – fuel feedstock;
  – fuel production process;
  – country of origin;
NUTS2 region (for EU feedstocks only, where regional average cultivation data is used as part of the carbon intensity calculation);

voluntary scheme(s) (including any supplementary checks where these have been performed);

land-use on 1 January 2008;

carbon intensity (see Aggregating multiple consignments below).

Aggregating multiple consignments

8.7 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.

8.8 Consignments with different carbon intensities can be aggregated for reporting purposes if all 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\textsuperscript{107}.

8.9 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.

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

8.10 To validate the accuracy of C&S reports a chain of custody must be established from the original party which generates the first 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).

8.11 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.

8.12 Book and claim systems are not allowed. This includes GreenPalm RSPO certified palm oil and equivalence trading\textsuperscript{108}, both of which were accepted prior to RED implementation.

8.13 Commission recognised voluntary schemes include chain of custody requirements. The list of schemes is available on the Commission website 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

\textsuperscript{107} 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.

\textsuperscript{108} ‘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.
part of it. A supplier must be able to provide proof that it has sourced the relevant feedstocks through the certified chain of custody in the form of a certificate or proof of sustainability\textsuperscript{109} issued under the voluntary scheme.

When to set up a chain of custody

8.14 Where part or all of a supply chain is not covered by a voluntary scheme, suppliers must set up their own chain of custody ensuring that a mass balance approach is used to balance the inputs and outputs from each entity in the chain.

8.15 Even where a recognised voluntary scheme is used, there may be limitations of the scheme which need to be addressed. These include:

- Operators of voluntary schemes may opt to seek Commission recognition that they meet some, but not all, of the RED criteria. There are recognised voluntary schemes that do not include a chain of custody element or 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 (or origin of the waste/residue) 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 reporting party who is applying for RTFCs.

8.16 Guidance on how to set up a chain of custody and on the detailed rules of operating a mass balance system is provided below.

Guidance for operating a mass balance type of chain of custody

8.17 Each party in the biofuel supply chain, from the origin of the feedstock to the reporting party, 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 demonstrate that the fuel meets the RED sustainability criteria and the fuel will therefore not be considered sustainable biofuel for the purposes of the RTFO.

Responsibilities and procedures

8.18 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.

\textsuperscript{109} Voluntary schemes produce documentation which demonstrates that a consignment of biofuel or biofuel feedstock meets the requirements of the scheme. This document follows the feedstock or biofuel along the chain of custody. These documents may have various names depending on the voluntary scheme. For ease we will use the most typical terminology, that is, certificates or proofs of sustainability.
8.19 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;
- organise external checks of the data where commercial confidentiality may prevent the reporting party making these checks for themselves;
- 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**

8.20 The mass balance approach must 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.

8.21 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 3.

![Diagram of a site's data flow](image-url)
8.22 Suppliers of biomethane, or fuels for which biomethane is a precursor (for example biomethanol or MTBE), can use national or international gas grid systems as part of their chain of custody provided that certain conditions are met. These conditions are specified in Chapter 2 of the Process Guidance.

**Timeframe**

8.23 It is recommended that parties in the supply chain undertake a periodic inventory of site-level C&S 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 C&S 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.

8.24 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 three months. In all cases mass balance time periods of reporting parties should not extend across two different obligation periods.

8.25 Voluntary schemes have their own specified balancing up periods, typically of three months. Schemes recognised by the Commission are accepted under the RTFO. Parties using a voluntary scheme recognised by the Commission for the mass balance criteria of the RED should use the mass balance timeframe of that voluntary scheme.

**Record keeping**

8.26 Each party in the chain of custody must keep records relating to their inputs and outputs and any conversion factors. This information should concur with the information on invoices and other records, e.g. shipping records, to enable C&S data claims to be traced back through the supply chain. This information must be available for verifiers or the Administrator to check.

**Input and output records of C&S data**

8.27 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**

8.28 These records refer to the conversion factor of inputs to outputs (e.g. rapeseed to rapeseed oil). Each party in the supply chain should maintain records of its own conversion factors.
8.29 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 used\textsuperscript{110}. 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.

**Periodic inventory of C&S data**

8.30 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).

8.31 Example formats for the records described above are illustrated in Annex F:

**Selling products with C&S data**

8.32 Records of commercial transactions must enable the reporting party and other parties in the supply chain, and the verifier appointed by the reporting party, to trace back through the supply chain to check any C&S claims made.

8.33 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;

\textsuperscript{110} Default inputs and standard values can be found in the detailed carbon intensity spreadsheet online.
• 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.

8.34 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 can be used to trace C&S data back up the supply chain. Conclusive evidence on the nature of the material can only be provided from the origin of that material.

**Allocation of sustainability information**

8.35 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 the 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.

8.36 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 'RME from non-protected cropland'.

8.37 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.

8.38 The same principle applies when dealing with partially renewable fuels. If a party has two consignments in a single tank, one of renewable methanol and one of non-renewable methanol, although they are physically mixed they can be sold to supplier A and supplier B as 100% renewable methanol and 100% non-renewable methanol, respectively.

8.39 For the parts of the supply chain where commodities are traded as single feedstocks, i.e. before conversion into biofuel, 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.

8.40 Companies should employ a transparent and consistent approach to reporting the proportion of different feedstocks in the fuel that they bring to the market.

8.41 Once C&S data has been assigned to biofuel at the duty point, further substitution of the C&S data with a different C&S dataset through the use of mass balance is not permitted\(^ \text{111} \). This means that once C&S data has been submitted to a verifier for verification or submitted to the Administrator as part of an application for RTFCs it cannot be substituted for another C&S data set. This applies whether or not the verification of that C&S data or the application for RTFCs was successful.

**Accounting for gains and losses of biofuel volumes**

8.42 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

\(^{111}\) Note, this is distinct from correcting inaccurate data in relation to the same biofuel e.g. as part of the verification process, or due to new information being gleaned from the supply chain.
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'**

8.43 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).

8.44 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. The following two examples clarify this rule.

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

8.45 'Mill M' produces and sells sugar cane-derived products (sugar and bioethanol) - see Figure 4. 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 sustainable 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 ten 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).

8.46 The sugar produced by Mill M cannot also be sold with a claim of meeting the RED criteria, as this would be a double claim. In addition, it cannot be counted towards the support scheme of any other European Economic Area state, nor towards any other UK renewable energy obligations.
Example 2. Allocation of C&S data between sugar and bioethanol produced at different mills.

8.47 Company A (‘Site A’) stores and trades in sugar cane-derived products (sugar and bioethanol)\(^{112}\) - see Figure 5. 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, which 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 because this would effectively be running the mass balance over several sites. 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.

\(^{112}\) This may be a somewhat contrived situation, but it serves to demonstrate the issue that is relevant here.
The certificate represents the flow of certified products

Figure 5 Examples of transfers of C&S data between different feedstock derived products
9. Wastes, residues and dedicated energy crops

Chapter summary

This chapter provides guidance on the categorisation of certain materials as wastes or residues for the purposes of the RTFO, the level of reward, and the processes the Administrator will follow. It also provides relevant definitions, and the new category of dedicated energy crops is explained.

In addition, the chapter outlines the particular requirements for C&S reporting on biofuels made from these feedstocks. The chapter refers to tables with lists of materials assessed by the Administrator and their single or double counting status. The tables are provided as a separate document on the Gov.uk website, which will be kept updated during the obligation year as materials are added. This chapter also provides guidance on what to do if your biofuel feedstock is not listed.

Summary

9.1 Some of the requirements for biofuels made from wastes and residues are different to requirements for biofuels made from other feedstocks.

9.2 Biofuels produced from certain wastes or residues can have up to three advantages compared to other biofuels:

- **Double reward** - Renewable fuels derived from certain waste or residue feedstocks are awarded double the RTFCs per litre or kilogram supplied. The Administrator will award double RTFCs where it believes it is appropriate to do so in light of the ‘effects’ set out in the Energy Act (2004) Section126(4) produced by that fuel. When making a decision to award double RTFCs the Administrator must consider any alternative uses and alternative disposal outcomes which could have been adopted or used for the relevant residue or waste.

- **Criteria limited to GHG emissions and mass balance** - Fuels produced from materials that meet the definition of waste or residue, other than agricultural, aquaculture, fisheries and forestry residues, need only fulfil the sustainability criteria set out in Article 17(2) of the RED - they do not need to comply with the land criteria.

- **No upstream GHG emissions** - The RED provides that 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.
9.3 From 15 April 2018, the category 'dedicated energy crops' is introduced. The definition, which is provided in full below, covers crops that are ligno-cellulosic and non-food cellulosic material and which are grown for the purpose of being used as fuel (and not food or feed). Biofuels derived from these materials are double rewarded and are also required to comply with the land-use (sustainability) criteria. Biofuels produced from dedicated energy crops do not count towards the crop cap or the development fuel target. Non-biological renewable fuels (RFNBOs) are also eligible for reward from 15 April 2018, and receive double RTFCs per litre or kilogram supplied.

9.4 In addition, from 1 January 2019, the Administrator introduced a specific target for 'development fuels'. A development fuel is a fuel made from sustainable wastes or residues that the Administrator considers are eligible for double RTFCs (although segregated oils and fats such as used cooking oil and tallow are excluded), or a RFNBO, that is of a specified fuel type.

9.5 Fuels that count towards that target will be awarded double 'development fuel'. RTFCs (See Process Guidance, Chapter 2 for more information on eligible fuel types).

Definitions

9.6 The definition of waste included in the RTFO Order from 15 April 2018, is:

'waste' means any substance or object which the holder discards or intends or is required to discard.

9.7 This definition excludes:

substances that have been intentionally modified or contaminated to for the purpose of transforming it into a waste.

9.8 The Administrator considers that a 'segregated oil and fat' refers to a material that is capable of being used as a transport fuel directly, after extraction, or after conversion by transesterification, into a usable fuel, irrespective of any blend wall limits on use.

9.9 Examples of excluded material therefore include:

- Waste vegetable oils, fish oils and animal fats (tallow and greases), mono, di and tri glycerides however mixed and extracted
- Segregated or mixes of free fatty acid, fatty acid esters and any derivative thereof.

9.10 This exclusion does not apply to waste or residue-derived materials that require significant upgrading (via thermochemical or catalytic cracking) in order to produce fuels.

9.11 Definitions of 'ligno-cellulosic material', 'non-food cellulosic material', 'residues from agriculture, aquaculture, fisheries or forestry' and 'processing residue' are introduced in the RTFO Order to reflect the amended RED. A new definition is also added to the RTFO for 'dedicated energy crops'. The new definitions are:

- 'ligno-cellulosic material' means material composed of lignin, cellulose and hemicellulose such as biomass sourced from forests, woody energy crops and forest based industries' residues and wastes;

Note that although the development fuel target was introduced on 1 January 2019, development fuel RTFCs are eligible to be claimed from Year 11 of the RTFO (15 April 2018 to 31 December 2018). See Process guidance.


- ‘non-food cellulosic material’ means feedstocks mainly composed of cellulose and hemicellulose, and having a lower lignin content than ligno cellulosic material; it includes food and feed crop residues (such as straw, stover, husks and shells), grassy energy crops with a low starch content (such as ryegrass, switchgrass, miscanthus, giant cane, cover crops before and after main crops), industrial residues (including from food and feed crops after vegetal oils, sugars, starches and protein have been extracted), and material from biowaste;

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

- ‘dedicated energy crops’ means crops which consist of non-food cellulosic material or ligno-cellulosic material, except saw logs and veneer logs; which are grown for the purpose of being used as fuel; which are not a residue or a waste; and which would not normally be used for food or feed.

- ‘processing residue’, in relation to a production process, means a substance that is not the end product sought directly from the process; the production of which is not a primary aim of the process; and in respect of which the process has not been deliberately modified in order to produce it.

9.12 The definition of residues from agriculture, aquaculture, forestry and fisheries, suggest 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.

9.13 For the purposed of the RTFO, products are materials that are not wastes or residues, and are single rewarded. 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 (i.e. a co-product). Biofuels derived from crop feedstocks, including dedicated energy crops, will need to meet the land criteria, see Chapter 4.

**Identifying which waste and residue materials are double rewarded**

9.14 The Administrator will decide whether the waste or residue derived fuel produces one or more of the ‘effects’ set out in the Energy Act (2004) S.126(4). These are the effects of the production, supply, or use of fuel from such feedstocks on:

- carbon emissions;
- agriculture;
- other economic activities;
- sustainable development;
- or the environment generally.

9.15 If the Administrator decides that the fuel produces one or more of those effects, the Administrator will then decide whether, based on those effects, to award double RTFCs.
9.16 When making a decision the Administrator must consider any alternative uses and alternative disposal outcomes which could have been adopted or used for the relevant residue or waste.

**List of wastes, residues and dedicated energy crops**

9.17 The tables available separately on the Gov.uk [website](https://www.gov.uk) provide guidance as to which feedstocks are considered products, residues, wastes or dedicated energy crops for the purposes of the RTFO, and their level of reward. They list the key materials the Administrator is aware of that might be used to produce biofuels at the time of publication.

9.18 The RTFO Administrator may periodically review and update the tables on the Department's website to add new feedstocks, or if sufficient evidence emerges to indicate that a material should be treated differently. The treatment of tallow in particular will be kept under consideration and reviewed in relation to legislative changes and to assess the impact on other markets resulting from additional incentives for tallow based biodiesel.

9.19 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 Administrator (email:rtfo-compliance@dt.gsi.gov.uk).

9.20 It is the responsibility of suppliers to demonstrate to the RTFO Administrator's satisfaction that materials are wastes or residues. The Administrator will ask the supplier to provide information on the process that results in the material and its economic value and other uses. This information will be considered according to the principles set out in this guidance.

9.21 The Administrator 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 Administrator will then come to a view on whether the material is a waste or residue for the purposes of the RTFO, and if so, the level of reward.

9.22 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.

9.23 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).

9.24 The Administrator's view on whether a feedstock is a residue or a waste and on the level of reward is relevant to the RTFO scheme only. The Administrator's view is not applicable to the status of materials under the Renewables Obligation, nor under the WFD. This applies to any subsequent views the Administrator reaches on wastes and residues for the RTFO.
Categorisations under the RTFO

9.25 In considering the appropriate classification for materials, in addition to the definitions outlined above the RTFO Administrator will take into account the following considerations:

- How materials are treated under the RED or communications related to the RED issued by the European Commission. Note that decisions on whether a material double counts under the RTFO are for the Administrator (as set out above).

- 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.
  - Any material that has been intentionally modified to count as a waste (e.g. by adding waste to non-waste) will be considered as a product.

9.26 Those handling materials considered waste under the WFD, 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 use.\(^\text{114}\)

9.27 The Administrator will also take into account the treatment of materials by other regulators, Member States, further guidance from the Commission and any relevant determinations by the courts.

9.28 It is not possible to lay down definitive or absolute rules as to when particular substances will be wastes or residues or not, or on the level of reward. A judgment has to be made taking into account the circumstances of each case. The lists are not exhaustive. There may be further materials that are not currently included in the tables that may qualify as wastes or residues following the application procedure outlined above.

9.29 The application for, and/or issuance of, RTFCs under the RTFO does not certify that the fuels supplied are compliant with the Motor Fuel (Composition and Content) Regulations 1999. Suppliers are reminded that they have a wider obligation to consider the risks to human health and the environment. These impacts include that of air quality resulting from the combustion of novel and potentially contaminated feedstocks.

Demonstrating that a biofuel feedstock is a waste or residue

9.30 As with other aspects of demonstrating the sustainability criteria, voluntary schemes are accepted as proof of the feedstock used for the biofuel. The scheme documentation must state the name of the feedstock, for example 'used cooking oil', in the certificate or proof of sustainability. Suppliers can refer to the Administrator's online tables to determine the level of reward.

9.31 Suppliers should be aware of additional guidance for the chain of custody approach for wastes and residues published by the Commission in a letter to voluntary schemes on 10 October 2014 (see section 8.4).

9.32 Outside of voluntary schemes suppliers will need to demonstrate a full chain of custody to the origin of the material. Further information on appropriate evidence and demonstrating compliance is in Chapter 10.

**GHG emission calculations for wastes and residues**

9.33 The default carbon emission value for waste vegetable or animal oil biodiesel can only be used for those wastes and residues where this is indicated in the list of wastes and residues. In deciding whether this default value can be used, the Administrator will consider how similar the process is to that used to calculate the waste vegetable or animal oil default value.

9.34 When calculating actual GHG emission values, all emissions from transport involved in collecting the waste or residue and transporting it for further processing should be included. The 'process of collection' referred to in RED Annex V Part C (18) means the beginning of the process of collection. 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.

9.35 When calculating actual GHG values all emissions from processing the waste material to extract the useful portion must also be included, for example if palm sludge oil is extracted from palm oil mill effluent, the GHG emissions from this will need to be calculated and allocated to the final biofuel.

9.36 For full details of reporting default and actual GHG values, please see Chapter 5 and Chapter 6 of this guidance.
10. Demonstrating compliance: evidence requirements

Chapter summary
This chapter provides guidance on the types of evidence suppliers should be able to identify in the supply chain and the reliance that can be placed upon them.

Introduction

10.1 As set out in Chapter 8, each party in the chain of custody must keep records relating to the feedstock or renewable fuel that they have received and supplied. In order to ensure that a full chain of custody is in place, records for both the C&S data and the physical product will need to be complete. This information may need to be made available in the following circumstances:

- for the final reporting party to check before submitting an application for RTFCs to the RTFO Administrator;
- for a verifier to review whilst undertaking an assurance engagement on a supplier's application for RTFCs;
- for the RTFO Administrator to review whilst checking the accuracy of information provided with an application for RTFCs or undertaking an investigation. 

10.2 Various types of evidence will exist depending on the nature of the feedstock, its country of origin, and the supply chain. The following sections describe the types of evidence which may be available to demonstrate compliance with the sustainability criteria. Different types of documentation are also provided along with guidance on the level of reliance that should be placed on them. The RTFO Administrator will reference this guidance when conducting its own checks.

Evidence requirements for key C&S data

Evidence of compliance with recognised voluntary schemes

10.3 Reporting that a biofuel meets a voluntary scheme which has been recognised as meeting one or more of the RED sustainability criteria, is proof of compliance with those criteria.

10.4 Similarly, reporting that a RFNBO meets a voluntary scheme which has been recognised as meeting one or more of the RED sustainability criteria, is proof of compliance with those criteria.

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115 See the Sustainability Compliance Policy in the Process Guidance for details.
10.5 Voluntary schemes may not cover all of the mandatory criteria of the RED. In this case a scheme can only be accepted as evidence for the criteria it has been recognised for. Other evidence is required to demonstrate compliance with the RED criteria not covered by the scheme.

10.6 For renewable fuels covered by a voluntary scheme, a certificate or proof of sustainability generated by the scheme must exist relating to the fuel in question. Additional evidence is not required to substantiate the C&S information included on the certificate. However, the claim of compliance with the scheme and the certificate must be legitimate, the recognised version of the scheme must be used, and the volumes of renewable fuel must be reported accurately.

10.7 A certificate issued under the scheme is the only acceptable form of evidence that the renewable fuel in question was certified and meets the sustainability criteria. Neither membership of a voluntary scheme or an audit of an individual supplier to scheme requirements provides certification for consignments of biofuel.

10.8 Suppliers should ensure that the certificate includes the necessary information to apply for RTFCs. Where mandatory or other reported C&S information is not included in the scheme’s certificate then other evidence will need to be obtained to cover the missing information.

10.9 If a voluntary scheme does not include all of the suppliers in the fuel chain, a separate chain of custody must be in place for the stages of the supply chain not covered by the scheme. Evidence must be available to demonstrate this.

10.10 Each scheme has its own system for tracing registrations and any certificates issued. Some include numbered certificates which can be cross-checked using an online database. Some have strict rules on the claims that can be made, such as a requirement for all parties in the chain of custody, including the reporting party, to be registered and certified for a claim to be legitimate. Certificates issued outside of scheme rules are not legitimate and should not be relied upon.

10.11 Some voluntary schemes include information on the certificate or proof of sustainability that is not required to be reported under the RTFO. Missing or inaccurate information in these fields may render the certificate or proof of sustainability invalid under the scheme rules meaning that it cannot be relied upon for RTFO purposes.

10.12 Where a voluntary scheme has been used but the version differs from the one that was recognised by the Commission, this may still provide some evidence, but does not automatically demonstrate compliance. In this case, it should be treated as other third party assurance - see Third party audits or assurance below.

Evidence of the biofuel feedstock

10.13 Evidence from the origin is the only form of acceptable evidence to prove feedstock type and any C&S data relating to the land on which a crop was grown. As with all evidence, evidence from the origin is subject to checks on its credibility, e.g. that the entity carries out a business that is expected to produce an appropriate volume of the feedstock whether it is a crop or a waste or a residue.

10.14 Evidence from the origin is expected to include, as a minimum, the entity's name and address, the date of transfer, and the quantity and nature of the material transferred. See Annex F: Example chain of custody records.
10.15 Formal documents are preferred and are required where they may normally be expected to be available. The availability of formal documents may depend on the country of origin. For example, a formal waste transfer note (WTN) should exist for waste products within the UK, and any registered business is required to produce sales invoices.

**Evidence of feedstock type in claims for double counted feedstocks**

10.16 Considering the financial incentive that double counting of certain feedstocks presents, it will be particularly important to examine evidence of feedstock type for these claims. Evidence will be required that the fuel is indeed made from the feedstock that has been claimed and this evidence must come from the origin. Evidence will vary with feedstock type and source. For example, in the case of used cooking oil, evidence of the original collection of the oil from restaurants or other catering establishments would be required.

10.17 For RFNBOs, evidence of the amounts of each type of renewable electricity and/or renewable heat and/or renewable cold purchased will be required, providing assurance that bioenergy or fossil energy inputs have not been used to generate wholly RFNBO fuel volumes. Evidence that the feedstocks (materials providing atoms to the fuel) used (e.g. water, CO₂) do not contain any energy will also be needed. In addition, evidence will be required that the fuel is indeed made from the process energy that has been claimed, and this evidence regarding the process energy must come from the origin (see section 10.14). For example, in the case of solar electricity, a power purchase agreement, or proof of ownership of the solar generation plant by the RFNBO plant, and meter readings would be required, plus a statement regarding the connection to the grid.

10.18 Whether a feedstock is categorised as a waste, residue or dedicated energy crop under the RTFO is determined by the Administrator. A list of feedstocks is available online.

**Evidence supporting carbon intensity data**

10.19 Where a default value for the carbon intensity is used, it is necessary to ensure that the feedstock (and process if applicable) is correct and that the correct default value has been applied. For all crop-based feedstocks it is also necessary to determine that no change in (RED-compliant) carbon stocks took place.

10.20 Where a reporting party has reported an actual value for the carbon intensity, and where this value has not been provided through a voluntary scheme, records and evidence relating to the calculation must be kept and be available for review.

10.21 Where actual carbon emissions data is provided part way along the chain of custody (including through a voluntary scheme) e.g. for cultivation and/or processing, reporting parties and verifiers should check that the calculation includes any additional carbon emissions which may have occurred along the rest of the fuel chain.

**Evidence for previous land use**

10.22 Guidance is given at the end of Chapter 4 of sources of evidence which may be available to demonstrate compliance with the land use criteria.
Evidence from audits within the supply chain

Third party audits or assurance

10.23 Evidence of third party audits may be provided in a number of circumstances. These include:

- where a supplier has used a voluntary scheme which has not been recognised by the Commission;
- where a member of the supply chain has arranged independent verification of the data to that point in the fuel chain;
- as proof of compliance with the RTFO Biofuel Sustainability Standard;
- as evidence for the use of actual carbon data.

10.24 For third party assurance to be credible enough to be relied upon exclusively, the following conditions must be met:

- the subject matter (i.e. the data that is being assured) must cover the data that is being reported to the Administrator;
- the assurance must be provided by a suitably competent and independent person;
- the assurance provider must be working to a standard appropriate to the data they are verifying;
- the assurance provider must have used appropriate assurance criteria and specify these in the assurance statement;
- testing procedures must be undertaken to an appropriate methodology and sufficient sample size to be relied upon. For example, the assurance provider should have tested, using an appropriate sample size, that the C&S information is traceable back to the party or parties that generated the original information through an appropriate chain of custody;
- the assurance conclusions must be sufficient to mitigate the need for further testing;
- the assurance report must convey the above information clearly or be accompanied by other referenced documentation which provides the information required.

10.25 If an audit states that it has been conducted to the RED sustainability criteria, it must be clear from the audit report (or accompanying documentation) how compliance with each criterion has been assessed and what evidence has been relied upon.

10.26 If the above conditions have not been met, suppliers should ensure that there is additional evidence available to substantiate the C&S data. When conducting its own investigations, the Administrator may also require evidence that has already been reviewed by an independent auditor.

10.27 In the case of actual carbon emission data, additional technical expertise is required when auditing the calculations and results. 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).

10.28 Audits on individual suppliers within the supply chain that do not include auditing of parties earlier in the supply chain may form part of a body of evidence, and may provide conclusive evidence about the operation of mass balance systems within the supplier which has been subject to audit. However, it should be noted that such reports are not considered to be evidence of a complete chain of custody and therefore do not of themselves provide conclusive evidence of meeting the sustainability criteria.

10.29 Where proof of compliance with the RTFO Biofuel Sustainability Standard is being presented, there must be evidence that a positive field audit was undertaken and that the auditor(s) met the norm for audit quality. No assessment of the content of audit reports is necessary, as the audit norm serves as a proxy for audit quality.

Second party audits

10.30 Second party audits are those undertaken on behalf of a supplier, but which are not 'independent'. For example, where a reporting party has hired experts to undertake checks on the supply chain, but has not engaged them under an assurance framework which requires independence such as ISAE 3000.

10.31 Second party audits may be used as evidence subject to the same requirements as for third party audits, with the exception of the requirement for independence. Where second party audits are used, the relationship between the individual or organisation undertaking the checks and the supplier must be considered. The level of independence required for undertaking credible checks will vary based on risk, including the complexity of information being checked.

Transport evidence and contracts

10.32 It is necessary to be able to demonstrate a chain of custody for both the sustainability data and the physical shipments. For feedstocks and other material prior to the conversion to biofuel, the C&S data and physical material must be consistent. It would therefore be expected that any C&S data included in the shipping documentation would be consistent with the C&S data transferred.

10.33 Once the feedstock has been processed into biofuel, physical shipments do not have to contain the same information as the C&S data under a mass balance system, but a physical quantity must have been shipped between the two entities to comply with the rules. For example, it may be legitimate to have a physical shipment of RME which has sustainability data for UCOME.

Transport documentation

10.34 Transport documentation should be available from the origin of the material to final supply. This can be expected to include vehicle and shipping documentation, loading and discharge inspection reports, weighbridge receipts and laboratory reports.

10.35 Prior to conversion of the feedstock into biofuel, the mass balance rules prevent allocation of C&S data to another feedstock. The chain of custody must therefore
show shipping and other transportation documents and data transfers which relate directly to each other.

10.36 A bill of lading is a document issued by a carrier, such as a shipping company, confirming that specified goods have been received as cargo for transportation. In addition, a bill of lading should state the particular vessel on which the goods have been placed, their destination and the intended recipient.

10.37 Bills of lading should be available for all renewable fuels or feedstocks that have been shipped into the UK. Feedstocks produced within the UK may not have bills of lading, but there should be equivalent transportation documentation that provides evidence of product type, quantity, delivery route and date of delivery. Renewable fuel volume data from bills of lading should be consistent with the data in the application for RTFCs.

**Contracts**

10.38 Suppliers may have contracts in place which help demonstrate their credibility. For example, a UCO supplier may have contracts for UCO collection.

10.39 Reporting parties should be able to provide contract documentation (including any amendments) that describes the renewable fuel that the supplier was contracted to supply, and which links to the invoices and bill(s) of lading that demonstrate that the specified renewable fuel was supplied.

10.40 Contract documentation may also set out requirements on the supplier to provide data, results of analytical testing, assurance to a particular standard or access to evidence.

10.41 Contracts do not however provide conclusive evidence that a product was supplied to the specified requirements, and therefore additional evidence will be required to demonstrate compliance.

**Waste Transfer Notes and regulated documents**

10.42 In the UK, a WTN is a document which is required, by law, to be completed when waste is transferred from one entity to another. There is a list of information which must be included in the document and there are penalties for falsifying the documents. Information on UK WTNs can be found on the UK Government website.

10.43 Documents describing themselves as WTNs relating to transactions in countries other than the UK may not be subject to the same levels of regulation, and therefore are not considered to provide the same level of evidence unless there is a similar regulatory system in place in the country in question. If a document claiming to be a waste transfer note is not subject to regulation, it is considered to be a self-declaration from the supplier concerned.

10.44 Suppliers moving animal by-products will also usually have regulatory controls and related documentation. In the UK for example the transport of such materials requires an 'Animal By-Products Movement Document'.

**Fraudulent documents**

10.45 Some shipping companies and other organisations host 'black lists' of examples of fraudulent documents on their websites\(^{116}\) which may give some indication of the types of fraudulent document that exist. None of these lists can be considered official.

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\(^{116}\) For example see http://www.rosneft.com/Investors/beware/examples/
and therefore the nature of the hosting organisation must be taken into account when considering the validity of any evidence provided.

**Other evidence**

**Technical testing**

10.46 On receipt of deliveries, reporting parties may perform tests of the feedstocks or renewable fuel for conformity with required physical and chemical properties. At this time, the RTFO Administrator does not consider that any chemical test is definitive for the identification of a feedstock or a resulting renewable fuel such as used cooking oil. However, these test results may provide supporting evidence about the type of feedstock and the percentage split for mixed feedstocks.

**Supplier self-declarations**

10.47 Declarations from upstream suppliers on the C&S characteristics of a biofuel feedstock, supported by contractual obligations upon suppliers to provide such information, are a means of obtaining and maintaining control over C&S information that are used by many reporting parties.

10.48 Whilst self-declarations are a form of evidence, they must be credible and they must form part of a complete chain of custody to the origin of a material.

**Management reports**

10.49 Parties in the supply chain may also have internal management reports which provide supporting evidence for their supply. This might include for example reports recording collection at restaurants.

**Supplier lists and customer endorsements**

10.50 Lists of upstream suppliers can provide supporting evidence of credible supply that can be checked. For example, a party supplying used cooking oil should have a list of collectors, who in turn should have a list of restaurants that they collect from.

**Other forms of evidence**

10.51 First-hand evidence, such as interviewing personnel, observing processes and controls and, potentially, physical inspections, are all important sources of evidence. Interviews and observations of processes and controls may form part of the evidence gathered for every RTFO audit by suppliers of verifiers. Physical inspections may be required for certain information where documented evidence has not been passed up the chain of custody; an example might be examining local land use records and speaking to local community members to verify the previous land use of an area.

10.52 Research reports produced by independent third parties that support a claim being made by a reporting party. For example, this might relate to an assertion that a biofuel feedstock was sourced from an area with no land-use change.

10.53 Other forms of evidence may also be available, in addition to those included here.
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. The RTFO Guidance for Verifiers adds detail to the information contained in this chapter.

11.1 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

11.2 Reporting parties are responsible for:

- preparing their data and submitting accurate data in their application for RTFCs;\(^\text{117}\);
- if necessary, preparing their additional information and submitting it 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;
- checking that their verifier meets, and continues to meet all of the requirements set out in ISAE 3000, the Guidance for Verifiers and the C&S Guidance.
- letting the Administrator know which verifier they have appointed so that they can be given the appropriate access to the RTFO Operating System (ROS), if the verifier is not already on ROS;
- indicating which consignments are to be verified in the period in question and submitting the data to the verifier using ROS;
- providing supporting information and evidence to the verifier and hosting any visits;

\(^{117}\) There is a civil penalty liability in the case that a reporting party has not taken reasonable steps to ensure the data is accurate. RTFCs may be revoked where the C&S information is materially inaccurate. See the Process Guidance for details.
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;
- checking the verification statement issued by the verifier to ensure that it meets the RTFO requirements and does not contain any errors;
- submitting their application for RTFCs to the Administrator including the verification statement;
- informing the Administrator if errors are discovered in their data after the application for RTFCs or annual report has been submitted.

11.3 Verifiers are appointed by, and are responsible to, the reporting parties. Consequently, the assurance opinion is addressed to the management of the reporting party. The RTFO states that the verification must meet the requirements of ISAE 3000 or an equivalent standard.

11.4 The Guidance for verifiers outlines the responsibilities for the key steps in the verification process.

Assurance standards - ISAE 3000

11.5 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.

11.6 ISAE 3000 was revised in 2013 with the new version applicable for all assurance statements dated on or after 15 December 2015. This guidance has been updated to reflect the new standard.

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

11.8 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:

"...nothing has come to our attention to cause us to believe there are errors in the data."\(^{118}\)

11.9 Where verification of volume data is requested for those fuels that do not have a defined duty point, the Administrator has powers to verify fuel volume data for such fuels itself, or to request either a 'limited' or 'reasonable' level of assurance level. The Administrator also has powers to request assurance that fuels rewarded with development fuel RTFCs meet the qualifying criteria.

11.10 Reasonable assurance requires a higher level of evidence gathering and as such the assurance opinion is expressed in a positive form, for example:

\(^{118}\) This example is intended to illustrate the concept of the negative form, not an entire assurance conclusion
"... based on our assessment, the data is free from material misstatement."\textsuperscript{119}The 'reasonable' level of assurance must also be used for verification of development fuels against their eligibility criteria, when requested by the Administrator.

11.11 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 gauged by reference to the nature and extent of evidence gathering that the verifier has undertaken and described in the report.

11.12 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 (Email: rtfo-compliance@dt.gsi.gov.uk or 0207 944 8555) to discuss this as soon as possible, and in any event, before instructing a verifier to report on the basis of an equivalent standard.

Independence of verifiers and ethical requirements

11.13 ISAE 3000 requires that "The practitioner shall comply with Parts A and B of the International Ethics Board for Accountants (IESBA) Code related to assurance engagements, or other professional requirements or requirements imposed by law or regulation that are at least as demanding."\textsuperscript{120} 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.

11.14 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 2010.

11.15 Suppliers should refer to the Guidance for verifiers for further details.

Professional competencies and capability

11.16 The RTFO Administrator does not provide accreditation of verifiers, it is for the supplier to ensure that the verifier they appoint is suitable.

11.17 Suppliers should ask verifiers to demonstrate their competencies as part of the appointment process. The Guidance for verifiers provides further details.

Quality control

11.18 ISAE 3000 requires that "The engagement partner shall... Be a member of a firm that applies ISQC 1, or other professional requirements, or requirements in law or regulation, that are at least as demanding as ISQC 1". ISQC is the "International Standard on Quality Control". (See the Guidance for verifiers for further details.)

11.19 Compliance with these quality control requirements is not optional, and therefore compliance with ISAE 3000 cannot be claimed unless they are in place. Suppliers should ensure that they appoint a verifier who fulfils these requirements.

\textsuperscript{119} This example is intended to illustrate the concept of the positive form, not an entire assurance conclusion.

\textsuperscript{120} http://www.ethicsboard.org/iesba-code
Preparing for verification

11.20 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.

11.21 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 supplier has relied on in formulating their RTFC claim;
- certifications and supporting assurance opinions held by the reporting party;
- periodic inventory records for the 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).

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

11.23 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.

11.24 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 C&S 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. This information must also be made available to the Administrator if required. The cooperation of those in the supply chain is therefore vital.

11.25 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.

11.26 It is not necessary to verify data which has already been subject to independent assurance, so long as that assurance meets all of the requirements of the RTFO Guidance. Where assurance within the supply chain does not meet all of the requirements, Chapter 10 gives suppliers and verifiers help in determining the level of reliance which should be placed on it.

11.27 It is not necessary to verify data which has been provided through a recognised voluntary scheme.
11.28 If the verifier finds evidence that data has been incorrectly reported, the supplier may amend the data or withdraw the consignments in question from the verification process.
Annex A: 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 for demonstrating RED compliance under the RTFO can be found on the DfT website.

Recognition of voluntary schemes by the Commission

A.1 The Commission has undertaken formal assessments of voluntary schemes against an Assessment Protocol template 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.\textsuperscript{121} Voluntary schemes are recognised by the 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. Voluntary schemes are recognised for a period of up to 5 years. After this period, schemes can reapply to the Commission to extend their recognition status beyond this date for another 5 years.

A.2 Those versions of voluntary schemes that are recognised by the Commission will automatically be recognised in the RTFO\textsuperscript{122} 20 days after publication in the Official Journal\textsuperscript{123}. 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 Commission is for a specific scope and version of a voluntary scheme, as listed on the Commission website. The schemes are also listed on the DfT website. Other versions are not automatically accepted under the RTFO and are not included in ROS.

A.4 In the case that a 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

\textsuperscript{121} It is a requirement of the RED that all Member States recognise any voluntary schemes that are recognised by the Commission.
\textsuperscript{122} The 20 day timescale is a Commission legislative norm and not one imposed by the RTFO Administrator.
own assessment still applies. This may involve re-assessing the version that the Administrator had previously recognised.

A.6 Note that a number of the schemes assessed by the Commission have developed supplementary EU versions, or ‘RED annexes’, in order to be recognised as RED compliant. In these cases, the Commission recognises the RED version of the scheme and does not recognise the version of the scheme without the RED annex. The ISCC scheme is one example of this - the ISCC EU version has been approved by the Commission, whereas the ISCC DE (German) version of the scheme has not.

**Highly Biodiverse Grassland**

A.7 The recognition status of voluntary schemes that cover the land-use criteria varies, in particular regarding RED Article 17(3)(c) on highly biodiverse grassland. This stems from the fact that when the RED came into force the definition of highly biodiverse grassland was unavailable.

A.8 A number of voluntary schemes are not recognised for Article 17(3)(c). The compliance status of each scheme in relation to this criterion can be found by referring to the Commission or DfT websites (links are provided in A.3 above).

A.9 Since 1 October 2015, following the application of Commission Regulation 1307/2014 on highly biodiverse grasslands, the RTFO Administrator only permits the use of schemes that are not recognised for Article 17(3)(c) if suitable alternative evidence is provided that the RED land-use criteria are met. Acceptable evidence is restricted to the following examples:\footnote{124 Will also need to be subject to third party verification, as with all biofuel consignments.}:

- if the feedstock supplied is either a waste or processing residue (see Chapter 9), as these feedstock types are exempt from the land criteria\footnote{125 Note that this exemption does not include agricultural, aquacultural, fisheries and forestry residues.}; or
- if a default GHG value is reported, as no land use change has occurred; or
- if the land-use category in January 2008 is reported as cropland (either ‘cropland - protected - no interference with nature protection purposes’ or ‘cropland - non-protected’) and it can be demonstrated that the land-use has not changed; or
- an RTFO Biodiversity Audit has been successfully undertaken (in-line with the guidance provided in Annex D).

A.10 Several schemes also allow feedstock certified to another Commission recognised voluntary scheme to be recognised within their certified supply chains. For example, Scheme A might recognise feedstock certified to Scheme B as being RED compliant and it is sold on as being Scheme A compliant. Depending on the schemes, and specifically whether they are recognised for Article 17(3)(c), there is a risk that since 1 October 2015 non-compliant feedstock enters the market (specifically if Scheme B is not recognised for Article 17(3)(c), but Scheme A is). Fuel suppliers should not report renewable fuel consignments if it is known that the voluntary scheme used to certify the feedstock was non-compliant with Article 17(3)(c) at the time of certification.

A.11 In addition, a number of schemes focus on the chain of custody only and rely on other Commission recognised voluntary schemes to certify the feedstock cultivation part of the chain. The RTFO Administrator considers that these schemes are compliant with Article 17(3)(c). However, fuel suppliers should not report renewable
fuel consignments if it is known that the scheme used to certify the feedstock was non-compliant with Article 17(3)(c) at the time of certification.

A.12 The Figure below provides an overview of how to determine compliance with Article 17(3)(c) when using voluntary schemes.

![Diagram](image)

**Figure 6** Overview of how to determine compliance with Article 17(3)(c) when using voluntary schemes.
Recognition of voluntary schemes by the RTFO Administrator

A.13 At the time of publication, no additional voluntary schemes have been recognised by the RTFO Administrator as demonstrating compliance with the sustainability criteria of the RED/RTFO.

A.14 In the interests of EU harmonisation, as a general rule it is expected that benchmarking of standards against the RED requirements should be conducted by the Commission to achieve harmonisation and to minimise administrative burden. 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 Commission assessments). The RTFO Administrator will always recommend to any such scheme that they apply directly to the Commission for recognition.

A.15 Where the RTFO Administrator has benchmarked a scheme as a result of significant delays to the Commission assessment process, this temporary recognition period will be for a maximum duration of three months (unless there are exceptional circumstances).

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 information:

- 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
- 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 10 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 7. The RTFO Administrator currently does not intend to benchmark new schemes against the RTFO Biofuel Sustainability Standard.

A.19 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.

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126 Voluntary schemes recognised by the Commission can be used in all national systems; however, some Member States have also recognised additional voluntary schemes.
Figure 7 Procedure for benchmarking voluntary schemes against the RED by the RTFO Administrator
Annex B: Recognition of other Member States' national systems

Annex Summary

This annex categorises different types of national systems set up by Member States for implementation of the RED (and FQD). These categories are used to identify those Member States national systems that might be relevant for biofuel supplied under the RTFO.

It also provides information on other Member State's national systems which have been assessed by the RTFO Administrator as providing evidence of compliance with the sustainability criteria.

Introduction

B.1 When implementing the biofuel sustainability provisions of the RED and FQD, Member States develop individual systems (their 'national system') which economic operators must use to demonstrate compliance with the RED (and FQD as applicable) in that Member State. Some Member States' national systems simply require that all biofuels must meet a voluntary scheme ('a voluntary scheme based national system')

B.2 The RTFO is the UK's national system. As the UK RTFO operates at the duty point, it is not permitted to verify biofuel as complying with the RTFO, gain evidence of that compliance from the Administrator (i.e. be awarded RTFCs), and then export the biofuel for additional reward in another Member State. Most Member States' national systems also operate at the duty point and are not therefore relevant for reporting under the RTFO.

B.3 For biofuel supplied under another Member State's national system to be relevant for reporting under the RTFO it should have the following features:

- Consignments of biofuel should be verified to be RED-compliant;
- This verification should occur before the biofuel crosses the duty point;
- There should be appropriate evidence in place e.g. official documentation issued by the Member State's authorities.

127 Voluntary schemes recognised by the Commission can be used in all national systems; however, some Member States have also recognised additional voluntary schemes.
B.4 Such a national system therefore operates in a similar way to a voluntary scheme, that is, the biofuel is verified as RED-compliant and then sold on/passed down the supply chain with evidence/documentation of that compliance.\textsuperscript{128}

Identification of other Member States' national systems

B.5 To identify which Member States have national systems that might provide evidence of RED-compliance relevant for reporting under the RTFO, an initial review was undertaken of how each Member State's national system operates.

B.6 The national systems of those Member States that might be relevant for reporting under the RTFO can then be checked in more detail to confirm whether this is the case. In addition, to aid economic operators, it can be determined which documentation is available as evidence that the biofuel has been verified as RED-compliant under the national system.

B.7 The following categorisation of Member State national systems can be made:

1. Member States that only allow the use of voluntary schemes (recognised by the Commission or the Member State) to demonstrate compliance with the RED requirements:
   a. Voluntary scheme based systems in which economic operators report information to the authorities and compliance is achieved as biofuels pass the duty point.
   b. Voluntary scheme based systems where economic operators report information into an electronic database, which is checked by Member State authorities prior to passing the duty point.

2. Member States that allow the use of voluntary schemes as well as other routes for economic operators to demonstrate compliance with the RED requirements:
   a. National systems based on ex-post verification of sustainability data provided by economic operators.
   b. National systems that link compliance with the RED requirements to the Common Agricultural Policy requirements or that introduce land zoning based on RED-compliant areas and non-RED compliant areas.

B.8 Member States in category 1a recognise consignments of biofuels as being RED-compliant at or after the duty point. After this point exports to the UK are considered highly unlikely, as the fuel supplier would have to pay duty in more than one Member State. Therefore, national systems in these Member States will not be checked in more detail by the Administrator.\textsuperscript{129}

B.9 Member States in categories 1b and 2b recognise consignments of biofuels as being RED-compliant prior to passing the duty point. This means biofuels from these Member States could in theory be exported to the UK labelled as ‘RED-compliant’ in

\textsuperscript{128} Note that whilst similar, there are important differences between such a national system and a voluntary scheme. The verification of biofuel material against the RED sustainability criteria under voluntary schemes starts at the origin of the material e.g., cultivation of the crop; whereas biofuel verified as RED-compliant under a Member State's national system would typically occur once the material has been processed into biofuel.

\textsuperscript{129} Note that with respect to 1a Member States, economic operators could request that the Administrator accepts the same voluntary schemes as that Member State does, following the process in the RTFO C&S Guidance. Note, however, that the Administrator considers that assessments of voluntary schemes should be made by the Commission and will only undertake a benchmark against the RED sustainability criteria in exceptional circumstances.
another Member State. These national systems could therefore be checked in more detail by the Administrator.

Member States in category 2a could have different bespoke designs for their national systems, which are not further categorised at this stage, but all seem to include the verification of sustainability data provided by economic operators. Any Member State in category 2a could be considered for further investigation because of the bespoke nature of the national systems. A key point to note will be whether the national system operates pre- or post-duty point.

National systems assessed by the RTFO Administrator

B.10 This section contains information on other Member State's national systems which have been assessed by the RTFO Administrator as providing evidence of compliance with the sustainability criteria, which can be used under the RTFO. National systems are assessed upon request following the process outlined in the document 'Recognition of other Member State's national systems'.

<table>
<thead>
<tr>
<th>National system</th>
<th>Type of evidence</th>
<th>Issued by</th>
<th>Verification?</th>
<th>Automatically accepted as evidence of compliance with the RTFO?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>Biomass certificate</td>
<td>Feedstock producer</td>
<td>Self-declaration</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Sustainability verification statement</td>
<td>Traders, processors or biofuel producers</td>
<td>Self-declaration</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Guarantee of sustainability</td>
<td>National Food Chain Safety Office</td>
<td>Verified by an independent auditor</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Table 19 National systems which can be reported under the RTFO

\[130\] Where accepted, the national system documentation has the same status as a voluntary scheme, that is, it demonstrates the biofuel (or biofuel material) meets the criteria at the point in the supply chain where it is issued. National systems that have been accepted can be reported in the 'voluntary scheme' box on ROS - see the RTFO C&S Guidance for more details.
Annex C: 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 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 available, suppliers use voluntary schemes recognised by the Commission or by the RTFO Administrator.

C.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 complied with for the RTFO Biofuel Sustainability Standard to be met.

C.2 The 'recommended' criteria and indicators are not required for the RTFO Biofuel Sustainability Standard to be met, but are considered good practice.

C.3 The RTFO Administrator will keep the criteria and indicators for the RTFO Biofuel Sustainability Standard under review, as well as the status of mandatory and recommended criteria, to ensure their continuing relevance.

Environmental criteria and indicators

C.4 The following table shows the environmental sustainability criteria and indicators (and recommended criteria) for the RTFO Biofuel Sustainability Standard.

<table>
<thead>
<tr>
<th>Principle 1: CARBON CONSERVATION</th>
<th>Biomass production will not destroy or damage large above or below ground carbon stocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion</td>
<td>Indicators</td>
</tr>
<tr>
<td>1.1 Preservation of above and below ground carbon stocks (reference date 01/01/2008).</td>
<td>Evidence that biomass production has not caused direct land-use change with a carbon payback time exceeding 10 years. 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.</td>
</tr>
</tbody>
</table>
**Principle 2: BIODIVERSITY CONSERVATION**

Biomass production will not lead to the destruction or damage of high biodiversity areas

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Indicators</th>
</tr>
</thead>
</table>
| 2.1 Compliance with national laws and regulations relevant to biomass production in the area and surroundings where biomass production takes place. | Evidence of compliance with national and local laws and regulations with respect to:  
- Environmental Impact Assessment;  
- land ownership and land-use rights;  
- forest and plantation management;  
- protected and gazetted areas;  
- nature and wildlife conservation;  
- land-use planning;  
- national rules resulting from the adoption of CBD\(^{131}\) and CITES\(^{132}\).  
The company should prove that:  
- 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. | Evidence that production does not take place in gazetted areas.  
Evidence that production does not take place in areas with one or more HCV areas\(^{133}\): HCV 1, 2, 3 relating to important ecosystems and species;  
- HCV 4, relating to important ecosystem services, especially in vulnerable areas;  
- HCV 5, 6, relating to community livelihoods and cultural values.  
Evidence that production does not take place in any areas of high biodiversity.  
**List of protected areas referred to in criterion 2.2:**  
- UNESCO World Heritage Sites\(^{134}\);  
- UCN List of Protected Areas categories I, II, III and IV\(^{135}\), according to the list available from 2003\(^{136}\) or more up to date lists or national data;  
- RAMSAR sites (wetlands under the Convention on Wetlands)\(^{137}\), according to the available list138 of more up to date lists or national data. |

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\(^{132}\) [http://www.cites.org/](http://www.cites.org/)

\(^{133}\) The definition of the 6 High Conservation Values can be found at [http://www.hcvnetwork.org](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  

\(^{135}\) 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.  
[http://www.iucn.org/about/work/programmes/gpap_home/gpap_quality/gpap_pacategories/](http://www.iucn.org/about/work/programmes/gpap_home/gpap_quality/gpap_pacategories/)

\(^{136}\) [http://www.unep-wcmc.org/un-list-of-protected-areas_269.html](http://www.unep-wcmc.org/un-list-of-protected-areas_269.html)


\(^{138}\) [http://www.ramsar.org/cda/en/ramsar-documents-list/main/ramsar/1-31-218_4000_0](http://www.ramsar.org/cda/en/ramsar-documents-list/main/ramsar/1-31-218_4000_0)
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.

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.

Documented and implemented management plan on how to avoid damage to or disturbance of the above mentioned species and habitats.

Recommendation

2.4 Preservation and/or improvement of surrounding landscape.

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.

Principle 3: SOIL CONSERVATION

Biomass production does not lead to soil degradation

Criterion

Indicators

3.1 Compliance with national laws and regulations relevant to soil degradation and soil management.

Evidence of compliance with national and local laws and regulations with respect to:
- Environmental Impact Assessment;
- waste storage and handling;
- pesticides and agro-chemicals;
- fertiliser;
- soil erosion.

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

The company should prove that:
- it is familiar with relevant national and local legislation;
- it complies with these legislations;
- it remains informed on changes in legislation.

3.2 Application of good agricultural practices with respect to:
- prevention and control of erosion;
- maintaining and improving soil nutrient balance;
- maintaining and improving soil organic matter;
- maintaining and improving soil pH;
- maintaining and improving soil structure;
- maintaining and improving soil biodiversity;
- prevention of salinisation.

Documentation of soil management plan aimed at sustainable soil management, erosion prevention and erosion control.

Annual documentation of applied good agricultural practices with respect to:
- prevention and control of erosion;
- maintaining and improving soil nutrient balance;
- maintaining and improving soil organic matter;
- maintaining and improving soil pH;
- maintaining and improving soil structure;
- maintaining and improving soil biodiversity;
- prevention of salinisation.

Recommendations
- records of annual measurements of:
  - soil loss in tonnes soil/ha/y;
  - N, P, K balance;
  - SOM and pH in top soil;
  - soil salts content.

Recommendation

3.3 The use of agricultural residues does not jeopardise the function of local uses of the by-products, soil organic matter or soil nutrients balance.

Documentation that the use of residues does not occur at the expense of important traditional uses (such as fodder, natural fertiliser, material, local fuel etc.) unless documentation is available that similar or better alternatives are available and are applied.
Documentation that the use of residues does not occur at the expense of the soil nutrient balance or soil organic matter balance.

### Principle 4: SUSTAINABLE WATER USE

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Indicators</th>
</tr>
</thead>
</table>
| 4.1 Compliance with national laws and regulations relevant to contamination and depletion of water sources. | Evidence of compliance with national and local laws and regulations with respect to:  
- Environmental Impact Assessment;  
- waste storage and handling;  
- pesticides and agro-chemicals;  
- fertiliser;  
- irrigation and water usage.  
The company should prove that:  
- 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. | Documentation of water management plan aimed at sustainable water use and prevention of water pollution.  
Annual documentation of applied good agricultural practices with respect to:  
- efficient water usage;  
- responsible use of agro-chemicals;  
- waste discharge.  
Recommendations:  
- 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

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Indicators</th>
</tr>
</thead>
</table>
| 5.1 Compliance with national laws and regulations relevant to air emissions and burning practices. | Evidence of compliance with national and local laws and regulations with respect to:  
- Environmental Impact Assessment;  
- air emissions;  
- waste management;  
- burning practices.  
The company should prove that:  
- 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. |

Table 20 Environmental criteria and indicators for the RTFO Biofuel Sustainability Standard
### Social criteria and indicators

**C.5** Table 21 illustrates the social criteria and indicators for the RTFO Biofuel Sustainability Standard, as well as the recommended criteria.

<table>
<thead>
<tr>
<th>Principle 6: WORKERS RIGHTS</th>
<th>Biomass production does not adversely affect workers’ rights and working relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criteria</strong></td>
<td><strong>Indicators</strong></td>
</tr>
<tr>
<td>6.1 Compliance with national law on working conditions and workers’ rights.</td>
<td>Certification applicant must comply with all national law concerning working conditions and workers’ rights.</td>
</tr>
<tr>
<td>6.2 Contracts</td>
<td>Certification applicant must supply all categories of employees (incl. temporary workers) with a legal contract in which the criteria below are registered.</td>
</tr>
<tr>
<td>6.3 Provision of information</td>
<td>Certification applicant must show evidence that all workers are informed about their rights (incl. bargaining rights).</td>
</tr>
<tr>
<td>6.4 Subcontracting</td>
<td>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.</td>
</tr>
<tr>
<td>6.5 Freedom of association and right to collective bargaining.</td>
<td>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.</td>
</tr>
<tr>
<td>6.6 Child labour</td>
<td>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).</td>
</tr>
<tr>
<td>6.7 Young workers</td>
<td>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.</td>
</tr>
<tr>
<td>6.8 Health and safety</td>
<td>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.</td>
</tr>
<tr>
<td>6.9 Wages/ compensation</td>
<td>Workers must be paid wages at least equivalent to the legal national minimum wage or the relevant industry standard, whichever is higher. Workers must be paid in cash, or in a form that is convenient to them and regularly. <strong>Recommendations:</strong> The certification applicant must pay the workers for unproductive time due to conditions beyond their control.</td>
</tr>
</tbody>
</table>
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.

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.

6.10 Discrimination
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.

6.11 Forced Labour
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.

Recommendation

6.12 Working hours
Usual working hours shall not exceed eight hours a day and 48 hours a week. Workers must have a minimum of 24 hours rest for every seven day period. 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.

6.13 Growers and mills should deal fairly with smallholders and other local businesses.
Current and past prices for produce are publicly available. Pricing mechanisms for produce, inputs and services are documented. 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. Agreed payments are made in a timely manner.

Principle 7: LAND RIGHTS
Biomass production does not adversely affect existing land rights and community relations

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1 Land right issues</td>
<td>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.</td>
</tr>
<tr>
<td>7.2 Consultation and communication with local stakeholders</td>
<td>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.</td>
</tr>
</tbody>
</table>

Table 21 Social criteria and indicators for the RTFO Biofuel Sustainability Standard
RTFO norm for audit quality criteria

C.6 When auditing a farm or plantation against the environmental and social criteria and indicators of the RTFO Biofuel Sustainability Standard, auditors must also 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).

C.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.

C.8 The norm is in line with the Commission 'Communication on voluntary schemes'.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Norm</th>
<th>Conformance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit</td>
<td><strong>2. Management of the audit programme</strong></td>
<td>ISO 19011: 2002, or justified equivalent.</td>
</tr>
<tr>
<td></td>
<td><strong>3. Audit frequency</strong></td>
<td>Once every five years for a full certification audit and once a year for a surveillance audit.</td>
</tr>
<tr>
<td></td>
<td><strong>4. Audit competency</strong></td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td><strong>5. Stakeholder consultation</strong></td>
<td>To include a range of relevant stakeholders.</td>
</tr>
<tr>
<td></td>
<td><strong>6. Public summaries of the certification audit</strong></td>
<td>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.</td>
</tr>
<tr>
<td>Accreditation</td>
<td><strong>7. Accreditation process for Accreditation Bodies (ABs)</strong></td>
<td>'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.</td>
</tr>
<tr>
<td>General</td>
<td><strong>8. Documentation management</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>

Table 22 Norm for audit quality

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139 Communication on voluntary schemes and default values in the EU biofuels and bioliquids sustainability scheme (COM 2010/C 160/01).
Additional field guidance for auditors

C.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 Commission and RTFO Administrator.

C.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 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 D: Biodiversity Audit

Annex summary
This annex describes the RTFO Biodiversity Audit. This optional approach can be used by suppliers wishing to conduct their own independent third party field audits against the requirements on highly biodiverse grassland as a means of demonstrating compliance with the RED biodiversity criteria. The approach can be used as a stand-alone audit, or alongside the RTFO Biofuel Sustainability Standard in Annex C.

The RTFO Administrator strongly recommends that in cases where an existing voluntary scheme is operational that has been recognised by the Commission or the RTFO Administrator to demonstrate compliance with the highly biodiverse grassland criterion, suppliers do not carry out an RTFO Biodiversity Audit.

D.1 On 29 January 2015, the Commission published an open letter to voluntary schemes giving further guidance on the “Implementation of the recently adopted criteria [that applies from 1 October 2015] and geographic ranges of highly biodiverse grassland”. Please refer to Commission Regulation 1307/2014 for more detail on the specific criteria and geographic ranges.

D.2 The RTFO Administrator strongly recommends that a consistent approach is taken for the RTFO Biodiversity Audit.

D.3 An independent expert with a specific qualification on biodiversity should establish, on a case-by-case basis, whether a specific piece of land is, or in the case of conversion, was highly biodiverse grassland (following the definition in the Regulation and further guidance in the open letter).

D.4 The process can be further differentiated according to the outcome of that assessment:
- If the land is not judged to be or have been highly biodiverse grassland in, or after, January 2008, the assessment only needs to be done once and the land is judged to be compliant with Article 17(3)(c);
- If the land is judged to have been highly biodiverse grassland and it is now not, then it is judged to be non-compliant with Article 17(3)(c);
- If the land is judged to be highly biodiverse grassland and no impact on biodiversity can be proven despite harvesting of material from that land for biofuel production, it can be judged to be compliant with Article 17(3)(c), but an annual expert assessment is required to ensure that biodiversity is maintained.

D.5 Please be aware that the Regulation on the definition of highly biodiverse grassland clarifies that the following geographic ranges shall always be regarded as highly biodiverse grassland:
- habitats of significant importance for animal and plant species of Union interest listed in Annexes II and IV to Directive 92/43/EEC;

D.6 If grassland has already been converted to cropland it is not possible to assess the characteristics of the land itself. In particular, if the conversion took place before 1 October 2015, then other relevant sources of information can be used. For example, information on the typical properties of grassland in the area, or other reliable information concerning the characteristics of the land. In such cases taking a precautionary approach would be appropriate.

D.7 Any experts conducting the assessment must be external, independent of the activity being audited and have no conflict of interest. Furthermore, experts are required to have the specific technical knowledge and experience on biodiversity with which to be able to perform the assessment. For instance, assessing whether grassland maintains the natural species composition and ecological characteristics and processes and whether grassland is species-rich can only be done by experts that have acquired a specific qualification for this purpose.

D.8 The report outputs from these assessments should be made available to the supplier’s independent verifier and to the RTFO Administrator upon request.
Annex E: Known future updates to carbon and sustainability reporting

**Annex summary**

This annex sets out known updates to the RTFO C&S reporting requirements that are likely to occur 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. Updates to the C&S Guidance may arise from the Comitology process; or from information published by the Commission or the RTFO Administrator.

**Outcomes of Comitology process**

**E.1** The following items are waiting to come into force or are awaiting outcomes from the Comitology\(^{140}\) process. The timetable of meetings of the 'Committee on the Sustainability of Biofuels and Bioliquids' is not fixed, and the Commission will call such meetings as and when items are due for discussion and approval.

**Decision on definition of degraded land for bonus**

**E.2** The Commission is working on a detailed definition of severely degraded and heavily contaminated land, which is necessary to enable economic operators who cultivate biofuel feedstocks on degraded land to claim a GHG bonus of 29 gCO\(_2\)e/MJ. A draft regulation was discussed by Member States in December 2015. If the regulation is agreed, this Guidance will be amended accordingly, although there are no agreed timings at present.

- 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 it comes into effect, 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 Commission Decision on the definition of degraded land is published and full RED implementation has taken place.

\(^{140}\) Comitology is the EU Committee system process which oversees the delegated acts implemented by the Commission.
New or amended Decisions on the recognition of voluntary schemes

E.3 On an ongoing basis, the Commission is expected to publish new Decisions, and potentially amended Decisions, relating to the recognition of voluntary schemes. The Commission publishes these Decisions on their website. The RTFO Administrator maintains 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 Commission

New or amended GHG default values

E.4 From time to time the Commission may publish new or amended GHG 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.

Information published by the RTFO Administrator

Additions or amendments to the list of wastes and residues

E.5 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 9.

Recognition of voluntary schemes and other Member States' national systems by the RTFO Administrator

E.6 The Administrator does not currently expect to assess any new voluntary schemes. However, in the case that it does assess and recognise a scheme it will be included in the table of voluntary schemes available online.

11.29 Any new assessments of other Member States' national systems and whether they can be used under the RTFO will also be included in this guidance - see Annex B:
Annex F: Example chain of custody records

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

Example records from a crop-based chain of custody

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Transaction date</th>
<th>Receiving company</th>
<th>Quantity (tonne)</th>
<th>Product</th>
<th>Country of origin</th>
<th>Voluntary scheme</th>
<th>Land-use on 1 Jan 2008</th>
<th>Crop yield (t/ha)</th>
<th>Nitrogen fertiliser (kg/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22001</td>
<td>15-4-2011</td>
<td>C1</td>
<td>1,000</td>
<td>Rapeseed</td>
<td>UK</td>
<td>Red Tractor</td>
<td>Cropland - non-protected</td>
<td>3.0</td>
<td>180</td>
</tr>
</tbody>
</table>

Table 23  Example of an output record from a farm\textsuperscript{142} supplying certified rapeseed to crusher C1

\textsuperscript{141} It is possible that the biofuel or biofuel feedstock met more than one voluntary scheme.

\textsuperscript{142} 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.
<table>
<thead>
<tr>
<th>Order no.</th>
<th>Transaction date</th>
<th>Supplying company</th>
<th>Quantity (tonne)</th>
<th>Product</th>
<th>Country of origin</th>
<th>Voluntary scheme</th>
<th>Land-use on 1 Jan 2008</th>
<th>Carbon intensity (g CO₂e/MJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22001</td>
<td>15-4-2011</td>
<td>F1</td>
<td>1,000</td>
<td>Rapeseed</td>
<td>UK</td>
<td>Red Tractor</td>
<td>Cropland - non-protected</td>
<td>29.3</td>
</tr>
<tr>
<td>22002</td>
<td>15-4-2011</td>
<td>F2</td>
<td>1,000</td>
<td>Rapeseed</td>
<td>UK</td>
<td>Red Tractor</td>
<td>Cropland - non-protected</td>
<td>29.3</td>
</tr>
<tr>
<td>22001</td>
<td>15-4-2011</td>
<td>F3</td>
<td>1,000</td>
<td>Rapeseed</td>
<td>UK</td>
<td>-</td>
<td>Cropland - non-protected</td>
<td>29.3</td>
</tr>
</tbody>
</table>

Table 24  Examples 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.

<table>
<thead>
<tr>
<th>Input</th>
<th>Rapeseed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>Rapeseed oil</td>
</tr>
<tr>
<td>Unit</td>
<td>kg rapeseed oil / kg rapeseed</td>
</tr>
<tr>
<td>Value</td>
<td>0.40</td>
</tr>
<tr>
<td>Valid from</td>
<td>1-1-2011</td>
</tr>
<tr>
<td>Valid until</td>
<td>1-6-2011</td>
</tr>
</tbody>
</table>

Table 25  Example record of rapeseed crusher conversion factor
<table>
<thead>
<tr>
<th>Order number</th>
<th>Transaction date</th>
<th>Receiving company</th>
<th>Quantity (tonne)</th>
<th>Product</th>
<th>Country of origin</th>
<th>Voluntary scheme</th>
<th>Land-use on 1 Jan 2008</th>
<th>Carbon intensity (gCO₂e/MJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23001</td>
<td>20-4-2011</td>
<td>B</td>
<td>400</td>
<td>Rapeseed oil</td>
<td>UK</td>
<td>Red Tractor</td>
<td>Cropland - non-protected</td>
<td>32</td>
</tr>
<tr>
<td>23002</td>
<td>20-4-2011</td>
<td>B</td>
<td>400</td>
<td>Rapeseed oil</td>
<td>UK</td>
<td>-</td>
<td>Cropland - non-protected</td>
<td>32</td>
</tr>
</tbody>
</table>

**Table 26** Example of an output record from a crusher

<table>
<thead>
<tr>
<th>Order number</th>
<th>Transaction date</th>
<th>Supplying company</th>
<th>Quantity (tonne)</th>
<th>Product</th>
<th>Country of origin</th>
<th>Voluntary scheme</th>
<th>Land-use on 1 Jan 2008</th>
<th>Carbon intensity (gCO₂e/tonne)</th>
</tr>
</thead>
<tbody>
<tr>
<td>23001</td>
<td>20-4-2011</td>
<td>C1</td>
<td>400</td>
<td>Rapeseed oil</td>
<td>UK</td>
<td>Red Tractor</td>
<td>Cropland - non-protected</td>
<td>32</td>
</tr>
<tr>
<td>23002</td>
<td>20-4-2011</td>
<td>C1</td>
<td>400</td>
<td>Rapeseed oil</td>
<td>UK</td>
<td>-</td>
<td>Cropland - non-protected</td>
<td>32</td>
</tr>
</tbody>
</table>

**Table 27** Example of an input record from a biofuel producer
This producer takes in certified rapeseed oil from crusher C1.
<table>
<thead>
<tr>
<th>Product</th>
<th>Country of origin</th>
<th>Voluntary scheme</th>
<th>Land-use on 1 Jan 2008</th>
<th>Carbon intensity (gCO₂e/MJ)</th>
<th>Inventory (tonne) 15 Apr 2008</th>
<th>Input (tonne)</th>
<th>Output (tonne)</th>
<th>Inventory (tonne) 15 May 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSR</td>
<td>UK</td>
<td>Red Tractor</td>
<td>Cropland - non-protected</td>
<td>32</td>
<td>1,000</td>
<td>800</td>
<td>400</td>
<td>1,400</td>
</tr>
<tr>
<td>OSR</td>
<td>Romania</td>
<td>-</td>
<td>Cropland - non-protected</td>
<td>32</td>
<td>2,000</td>
<td>0</td>
<td>0</td>
<td>2,000</td>
</tr>
<tr>
<td>OSR</td>
<td>UK</td>
<td>-</td>
<td>Cropland - non-protected</td>
<td>32</td>
<td>0</td>
<td>400</td>
<td>400</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 28 Example of an inventory record of C&S data for crusher C1

<table>
<thead>
<tr>
<th>Order number</th>
<th>Transaction date</th>
<th>Supplying company</th>
<th>Quantity (tonne)</th>
<th>Product</th>
<th>Country of origin</th>
<th>Voluntary scheme</th>
<th>Land-use on 1 Jan 2008</th>
<th>Carbon intensity (gCO₂e/MJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22001</td>
<td>20-4-2011</td>
<td>C1</td>
<td>1,200</td>
<td>Rapeseed oil</td>
<td>UK</td>
<td>Red Tractor</td>
<td>Cropland - non-protected</td>
<td>42.5</td>
</tr>
<tr>
<td>22002</td>
<td>20-4-2011</td>
<td>C1</td>
<td>4,800</td>
<td>Rapeseed oil</td>
<td>Unknown</td>
<td>-</td>
<td>Unknown</td>
<td>42.5</td>
</tr>
<tr>
<td>22005</td>
<td>20-4-2011</td>
<td>C2</td>
<td>400</td>
<td>CPO</td>
<td>Malaysia</td>
<td>RSPO</td>
<td>Cropland - non-protected</td>
<td>42.5</td>
</tr>
<tr>
<td>22006</td>
<td>20-4-2011</td>
<td>C2</td>
<td>600</td>
<td>CPO</td>
<td>Malaysia</td>
<td>-</td>
<td>Unknown</td>
<td>42.5</td>
</tr>
</tbody>
</table>

Table 29 Examples of an input record from biofuel company B
<table>
<thead>
<tr>
<th>Order no.</th>
<th>Transaction period</th>
<th>Receiving company</th>
<th>Quantity (tonne)</th>
<th>Fuel type</th>
<th>Feedstock</th>
<th>Biofuel production process</th>
<th>Country of origin</th>
<th>Voluntary scheme</th>
<th>Land-use on 1 Jan 2008</th>
<th>Plant in operation on or before 5 October 2015</th>
<th>Carbon intensity (gCO₂e/MJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>33001</td>
<td>4-2011</td>
<td>X</td>
<td>300</td>
<td>Biodiesel</td>
<td>Rapeseed oil</td>
<td>-</td>
<td>UK</td>
<td>Red Tractor</td>
<td>Cropland - non-protected</td>
<td>Yes</td>
<td>52</td>
</tr>
<tr>
<td>33002</td>
<td>4-2011</td>
<td>X</td>
<td>1,400</td>
<td>Biodiesel</td>
<td>Rapeseed oil</td>
<td>-</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Yes</td>
<td>52</td>
<td></td>
</tr>
</tbody>
</table>

Table 30  Example of an output record from biofuel company B
Table 31 Examples 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

Example records from a waste-based chain of custody

<table>
<thead>
<tr>
<th>Ref. no.</th>
<th>Supply date</th>
<th>Receiving company</th>
<th>Material supplied</th>
<th>Quantity, litres</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>1234</td>
<td>16 Mar 13</td>
<td>Collector 1</td>
<td>UCO</td>
<td>100</td>
<td>UK</td>
</tr>
</tbody>
</table>

Table 32 Example of an output record from a restaurant
The restaurant is supplying used cooking oil (UKO) to a UCO collector

<table>
<thead>
<tr>
<th>Ref. no.</th>
<th>Date collected</th>
<th>Supplier</th>
<th>Material collected</th>
<th>Quantity, litres</th>
<th>Origin</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1234</td>
<td>16 Mar 13</td>
<td>Restaurant 1</td>
<td>UCO</td>
<td>100</td>
<td>UK</td>
<td>Default</td>
</tr>
<tr>
<td>2345</td>
<td>17 Mar 13</td>
<td>Restaurant 2</td>
<td>UCO</td>
<td>200</td>
<td>UK</td>
<td>Default</td>
</tr>
</tbody>
</table>

Table 33 Example of an input record from a UCO collector/aggregator
The UCO collector collects UCO from a number of restaurants
<table>
<thead>
<tr>
<th>Ref. no.</th>
<th>Date supplied</th>
<th>Receiving company</th>
<th>Material supplied</th>
<th>Quantity, litres</th>
<th>Origin</th>
<th>Voluntary scheme</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3456</td>
<td>20 Mar 13</td>
<td>BPP 1</td>
<td>UCO</td>
<td>300</td>
<td>UK</td>
<td>none</td>
<td>Default</td>
</tr>
</tbody>
</table>

Table 34  Example of an output record from a UCO collector/aggregator
The UCO collector supplies the UCO to a biofuel production plant. The collector may also process the UCO into biofuel but in this example it is done by a separate economic operator.
<table>
<thead>
<tr>
<th>Ref no.</th>
<th>Date supplied</th>
<th>Supplier</th>
<th>Material supplied</th>
<th>Feedstock</th>
<th>Quantity, litres</th>
<th>Origin</th>
<th>Voluntary scheme</th>
<th>CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>3456</td>
<td>20 Mar 13</td>
<td>Coll 1</td>
<td>UCO</td>
<td></td>
<td>300</td>
<td>UK</td>
<td>none</td>
<td>Default</td>
</tr>
<tr>
<td>4567</td>
<td>20 Mar 13</td>
<td>Coll 2</td>
<td>UCO</td>
<td></td>
<td>500</td>
<td>France</td>
<td>none</td>
<td>Default</td>
</tr>
<tr>
<td>4568</td>
<td>22 Mar 13</td>
<td>Coll 3</td>
<td>UCO</td>
<td></td>
<td>400</td>
<td>Germany</td>
<td>ISCC EU</td>
<td>Default</td>
</tr>
</tbody>
</table>

Table 35  Example of an input record from a biofuel production plant
The biofuel production plant receives UCO from a number of UCO collectors

<table>
<thead>
<tr>
<th>Ref no.</th>
<th>Date supplied</th>
<th>Supplier</th>
<th>Material supplied</th>
<th>Feedstock</th>
<th>Quantity, litres</th>
<th>Origin</th>
<th>Voluntary scheme</th>
<th>Plant in operation on or before 5 October 2015</th>
<th>CI</th>
<th>Type of GHG data</th>
</tr>
</thead>
<tbody>
<tr>
<td>5678</td>
<td>30 Mar 13</td>
<td>Oil major 1</td>
<td>FAME</td>
<td>UCO</td>
<td>270</td>
<td>UK</td>
<td>None</td>
<td>Yes</td>
<td>14</td>
<td>Default</td>
</tr>
<tr>
<td>6789</td>
<td>30 Mar 13</td>
<td>Oil major 1</td>
<td>FAME</td>
<td>UCO</td>
<td>450</td>
<td>France</td>
<td>None</td>
<td>Yes</td>
<td>14</td>
<td>Default</td>
</tr>
<tr>
<td>7890</td>
<td>30 Mar 13</td>
<td>Oil major 1</td>
<td>FAME</td>
<td>UCO</td>
<td>360</td>
<td>Germany</td>
<td>ISCC EU</td>
<td>Yes</td>
<td>14</td>
<td>Default</td>
</tr>
</tbody>
</table>

Table 36  Example of an output record from a biofuel production plant
The biofuel production plant supplies FAME to an oil major. The conversion efficiency from UCO to FAME is 90% so the volumes are adjusted accordingly. Separate records are kept of the conversion factors.
### Table 37  Example of an input record for an oil major

The oil major receives FAME from a number of different biofuel production plants. Biofuel production plant 2 has used actual data to calculate the CI of consignment 9012 and has evidence of the input data used in the calculations.

<table>
<thead>
<tr>
<th>AC ref. no.</th>
<th>Fuel type</th>
<th>Quantity, litres</th>
<th>Feedstock</th>
<th>Biofuel production process</th>
<th>Country of origin</th>
<th>Previous land use</th>
<th>Voluntary scheme</th>
<th>Plant in operation on or before 5 October 2015</th>
<th>CI</th>
<th>Type of GHG data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1111</td>
<td>Biodiesel ME</td>
<td>40,270</td>
<td>UCO</td>
<td>n/a</td>
<td>UK</td>
<td>n/a</td>
<td>none</td>
<td>Yes</td>
<td>14</td>
<td>Default</td>
</tr>
<tr>
<td>2222</td>
<td>Biodiesel ME</td>
<td>450</td>
<td>UCO</td>
<td>n/a</td>
<td>France</td>
<td>n/a</td>
<td>none</td>
<td>Yes</td>
<td>14</td>
<td>Default</td>
</tr>
<tr>
<td>3333</td>
<td>Biodiesel ME</td>
<td>360</td>
<td>UCO</td>
<td>n/a</td>
<td>Germany</td>
<td>n/a</td>
<td>ISCC</td>
<td>Yes</td>
<td>14</td>
<td>Default</td>
</tr>
<tr>
<td>AC ref. no.</td>
<td>Fuel type</td>
<td>Quantity, litres</td>
<td>Feedstock</td>
<td>Biofuel production process</td>
<td>Country of origin</td>
<td>Previous land use</td>
<td>Voluntary scheme</td>
<td>Plant in operation on or before 5 October 2015</td>
<td>CI</td>
<td>Type of GHG data</td>
</tr>
<tr>
<td>------------</td>
<td>-----------</td>
<td>------------------</td>
<td>-----------</td>
<td>---------------------------</td>
<td>-------------------</td>
<td>------------------</td>
<td>------------------</td>
<td>-----------------------------------------------</td>
<td>----</td>
<td>------------------</td>
</tr>
<tr>
<td>4444</td>
<td>Biodiesel ME</td>
<td>40,000</td>
<td>UCO</td>
<td>n/a</td>
<td>UK</td>
<td>n/a</td>
<td>none</td>
<td>Yes</td>
<td>12</td>
<td>Actual data for entire fuel chain</td>
</tr>
</tbody>
</table>

Table 38  Example C&S record for an oil major for reporting in ROS
Consignments 5678 and 8901 from suppliers BPP1 and BPP2 have been aggregated as they have homogeneous C&S characteristics
### Annex G: Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Account holder</strong></td>
<td>An organisation holding an account with the RTFO Administrator, allowing them to be issued with or trade RTFCs.</td>
</tr>
<tr>
<td><strong>Actuals</strong></td>
<td>Shorthand for actual carbon values</td>
</tr>
<tr>
<td><strong>Administrative consignment</strong></td>
<td>An administrative batch of fuel. Any amount of biofuel that has a consistent set of sustainability characteristics.</td>
</tr>
<tr>
<td><strong>Biofuel</strong></td>
<td>Fuel made from recently-living biological material.</td>
</tr>
<tr>
<td><strong>Account holder</strong></td>
<td>Measurement of the variety of different life forms in a given area. High biodiversity is viewed as an indication of a healthy ecosystem.</td>
</tr>
<tr>
<td><strong>Carbon defaults</strong></td>
<td>Default carbon intensity values provided by the Commission.</td>
</tr>
<tr>
<td><strong>Carbon intensity</strong></td>
<td>The rate at which carbon is emitted in relation to the amount of energy produced.</td>
</tr>
<tr>
<td><strong>Carbon stock</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>C&amp;S</strong></td>
<td>Carbon and sustainability</td>
</tr>
<tr>
<td><strong>Certificates</strong></td>
<td>Shorthand for RTFCs</td>
</tr>
<tr>
<td><strong>CO₂</strong></td>
<td>Carbon dioxide</td>
</tr>
<tr>
<td><strong>CO₂e</strong></td>
<td>Carbon dioxide equivalent</td>
</tr>
<tr>
<td><strong>Comitology</strong></td>
<td>The EU Committee system process which oversees the delegated acts implemented by the European Commission.</td>
</tr>
<tr>
<td><strong>Commission</strong></td>
<td>The European Commission</td>
</tr>
<tr>
<td><strong>Dedicated energy crop</strong></td>
<td>Dedicated energy crops are non-food crops including lignocellulosic material and non-food cellulosic material, except saw logs and veneer logs. Dedicated energy crops are grown for the purpose of generating heat and electricity, or to produce transport biofuels.</td>
</tr>
<tr>
<td><strong>DDGS</strong></td>
<td>Dried distillers grains and solubles</td>
</tr>
<tr>
<td><strong>De minimis</strong></td>
<td>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 obligated suppliers below).</td>
</tr>
<tr>
<td><strong>Defaults</strong></td>
<td>Shorthand for default carbon values (see carbon defaults above).</td>
</tr>
<tr>
<td><strong>Development fuels</strong></td>
<td>Advanced renewable fuels, a target for which applies from January 2019 - see Process Guidance.</td>
</tr>
<tr>
<td><strong>Defra</strong></td>
<td>Department for Environment Food and Rural Affairs</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>DfT</td>
<td>Department for Transport</td>
</tr>
<tr>
<td>Economic operator</td>
<td>Any company or organisation involved in the fuel supply chain.</td>
</tr>
<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>ETBE</td>
<td>Ethyl-tertiary-butyl-ether. A type of biofuel.</td>
</tr>
<tr>
<td>FAME</td>
<td>Fatty-acid-methyl-ester. A type of biofuel.</td>
</tr>
<tr>
<td>Feedstock</td>
<td>Raw material used to produce biofuels</td>
</tr>
<tr>
<td>FQD</td>
<td>Fuel Quality Directive</td>
</tr>
<tr>
<td>gCO₂e/MJ</td>
<td>Unit of measurement of carbon intensity</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse gas</td>
</tr>
<tr>
<td>Grandfathering</td>
<td>Refers to biofuels produced in installations before certain dates and affects the GHG savings requirements.</td>
</tr>
<tr>
<td>ha</td>
<td>Hectare</td>
</tr>
<tr>
<td>HMRC</td>
<td>Her Majesty's Revenue and Customs</td>
</tr>
<tr>
<td>HVO</td>
<td>Hydro treated vegetable oil. A type of biofuel.</td>
</tr>
<tr>
<td>Input data</td>
<td>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.</td>
</tr>
<tr>
<td>Installation</td>
<td>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.</td>
</tr>
<tr>
<td>ILUC</td>
<td>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.</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organisation for Standardisation</td>
</tr>
<tr>
<td>ISAE</td>
<td>International Standard on Assurance Engagements</td>
</tr>
<tr>
<td>Land-use change</td>
<td>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.</td>
</tr>
<tr>
<td>LCA</td>
<td>Lifecycle analysis</td>
</tr>
<tr>
<td>MSW</td>
<td>Municipal solid waste. A feedstock.</td>
</tr>
<tr>
<td>MTBE</td>
<td>Methyl-tertiary-butyl-ether. A type of biofuel.</td>
</tr>
<tr>
<td>NDPB</td>
<td>Non-Departmental Public Body</td>
</tr>
<tr>
<td>NUTS/NUTS2</td>
<td>Nomenclature of Territorial Units for Statistics, a method of defining regions within European countries employed by the</td>
</tr>
</tbody>
</table>
European Commission. NUTS2 refers to the second level on the scale and divides the EU into 271 regions.

<table>
<thead>
<tr>
<th><strong>Obligated supplier</strong></th>
<th>A transport fuel supplier upon whom a renewable transport fuel obligation is imposed.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OSR</strong></td>
<td>Oilseed rape. A feedstock.</td>
</tr>
<tr>
<td><strong>Partially-renewable fuel</strong></td>
<td>Fuels that are produced in part from renewable feedstocks and in part from mineral/fossil feedstocks.</td>
</tr>
<tr>
<td><strong>PPO</strong></td>
<td>Pure plant oil. A type of biofuel.</td>
</tr>
<tr>
<td><strong>POME</strong></td>
<td>Palm oil mill effluent. An effluent from palm oil processing which can be captured and treated to prevent methane emissions.</td>
</tr>
<tr>
<td><strong>RED</strong></td>
<td>Renewable Energy Directive</td>
</tr>
<tr>
<td><strong>Renewable fuel</strong></td>
<td>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 refers to biofuels and RFNBOs.</td>
</tr>
<tr>
<td><strong>Reporting party</strong></td>
<td>A fuel supplier reporting to the RTFO Administrator.</td>
</tr>
<tr>
<td><strong>RFA</strong></td>
<td>Renewable Fuels Agency. An NDPB that administered the RTFO prior to its abolition in April 2011.</td>
</tr>
<tr>
<td><strong>RFNBO</strong></td>
<td>Renewable fuel of non-biological origin. A renewable transport fuel that does not have any biological content - rather the renewable energy content comes from renewable energy sources other than biomass. For example, renewable methanol produced from waste CO2 and hydrogen where the process is powered by geothermal electricity.</td>
</tr>
<tr>
<td><strong>RME</strong></td>
<td>Rape methyl ester (biodiesel made from rape seed)</td>
</tr>
<tr>
<td><strong>RO</strong></td>
<td>Renewables Obligation</td>
</tr>
<tr>
<td><strong>ROS</strong></td>
<td>RTFO operating system</td>
</tr>
<tr>
<td><strong>RTFC</strong></td>
<td>Renewable transport fuel certificate</td>
</tr>
<tr>
<td><strong>RTFO</strong></td>
<td>Renewable Transport Fuel Obligation. The statutory instrument used to implement the transport elements of the RED.</td>
</tr>
<tr>
<td><strong>RTFO Biofuel Sustainability Standard</strong></td>
<td>Set of criteria against which biofuel feedstock production may be audited. Developed from the RTFO Meta Standard.</td>
</tr>
<tr>
<td><strong>Selected default</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Standard value</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Supplier</strong></td>
<td>Any company or organisation supplying fuel or its precursors e.g. for biofuel this would include the crop and the virgin oil.</td>
</tr>
<tr>
<td><strong>UCO</strong></td>
<td>Used cooking oil. A feedstock.</td>
</tr>
<tr>
<td><strong>UCOME</strong></td>
<td>Used cooking oil methyl ester (biodiesel made from UCO)</td>
</tr>
<tr>
<td><strong>Verifier</strong></td>
<td>The person who undertakes the assurance of renewable fuel sustainability data on behalf of reporting parties. They must be independent of the reporting party whose data they are verifying.</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Voluntary scheme</strong></td>
<td>Schemes run by independent organisations that offer a route to providing assurance that renewable fuels meet certain sustainability criteria.</td>
</tr>
</tbody>
</table>
Annex H: Changes

<table>
<thead>
<tr>
<th>Section</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 6 (6.83 - 6.85)</td>
<td>Replaced with new text.</td>
</tr>
</tbody>
</table>

Table 39 Summary of main changes in Version 2019, February 2019