Department for Transport

Renewable Transport Fuel Obligation: Compliance Guidance

2024: 01/01/24 to 31/12/24

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1. Introduction

This guidance

1.1 The Renewable Transport Fuel Obligation (RTFO) commenced on 15 April 2008 and is intended to deliver reductions in greenhouse gas (GHG) emissions from fuel used for transport purposes by encouraging the supply of renewable fuels. The legislative basis for the RTFO is found in the Renewable Transport Fuel Obligations Order 2007 No. 3072 ('the RTFO Order'), as amended.

1.2 This document relates to fuels that pass the duty point (or alternative assessment time, see paragraphs 4.84 to 4.105) between 1 January 2023 and 31 December 2023 i.e. the 2023 obligation period.

1.3 This document provides guidance on how to comply with the RTFO Order as well as practical instruction on how to submit the required information to the Administrator. Specifically, it covers the following topics:

- applying for and maintaining an account with the RTFO Administrator (Chapter 2)
- the obligation that the RTFO Order puts on fuel suppliers and how it is met (Chapter 3)
- how renewable fuels are categorised (Chapter 4)
- how and when to submit fuel quantities to the RTFO Administrator (Chapter 5)
- applying for Renewable Transport Fuel Certificates (RTFCs) (Chapter 6)
- carbon and sustainability requirements (Chapters 7-9)
- mass balance and chain of custody requirements (Chapter 10)
- evidence requirements for demonstrating compliance with carbon and sustainability criteria (Chapter 11)
- appointing a verifier (Chapter 12)

1.4 This document 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. It is recommended that interested parties familiarise themselves with the information contained on the RTFO webpages before reviewing this detailed guidance. This document should be read in conjunction with the other guidance documents of the RTFO.

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

1.6 There are several different types of users who may be required or wish to interact with the RTFO and the Administrator. Accordingly, different chapters of this guidance are likely to be relevant to different individual users, as is outlined in Table 1.

Chapter	Fossil fuel supplier	Renewable and fossil fuel supplier	Renewable fuel supplier	Verifier	RTFC Trader
Chapter 1: Introduction	✓	✓	✓	✓	✓
Chapter 2: RTFO accounts	✓	✓	✓	✓	✓
Chapter 3: The obligation and how it is met	✓	✓	✓	✓	✗
Chapter 4: Categorisation of renewable fuels	✓	✓	✓	✓	✗
Chapter 5: Submitting fuel volume information	✓	✓	✓	✓	✗
Chapter 6: Renewable transport fuel certificates	✓	✓	✓	✓	✓
Chapter 7: RTFO Carbon and Sustainability Requirements	✗	✓	✓	✓	✗
Chapter 8: Demonstrating compliance with the Greenhouse Gas savings criteria	✗	✓	✓	✓	✗
Chapter 9: Demonstrating compliance with the land, forest and soil carbon criteria	✗	✓	✓	✓	✗
Chapter 10: Demonstrating compliance with the mass balance rules	✗	✓	✓	✓	✗
Chapter 11: Demonstrating compliance: evidence requirements	✗	✓	✓	✓	✗
Chapter 12: Appointing a verifier	✗	✓	✓	✓	✗

Table 1 Relevant chapters of this guidance for each user type

1.7 Further guidance is available online covering the following topics:

- guidance on third-party assurance and verification, including regarding the use of voluntary schemes
- additional guidance for suppliers of biomethane and Renewable Fuels of Non-Biological Origin (RFNBOs)
- a list of eligible feedstocks
- a list of renewable fuels and their renewability
- a list of recognised voluntary schemes
- standard and default carbon intensity data and templates for use when reporting under the RTFO
- codes to use when uploading CSV data files to the RTFO operating system and carbon calculator

1.8 Queries or comments should be directed to the Department for Transport's (DfT's) RTFO Unit at rtfo-compliance@dft.gov.uk.

The obligation and renewable transport fuel certificates

1.9 Suppliers of relevant transport fuel supplying petrol, diesel, gas oil or renewable fuel totalling 450,000 litres or more for use in a relevant transport mode during an obligation period must register with the administrator (see Chapter 2) and may be subject to an obligation under the Order (see Chapter 3).

1.10 Obligated suppliers may meet their obligation by redeeming Renewable Transport Fuel Certificates (RTFCs) or by paying a fixed sum for each litre (or equivalent – see paragraph 1.28) of fuel for which they wish to 'buy-out' of their obligation. RTFCs are gained by supplying sustainable renewable fuels (see Chapter 6). Those wishing to apply for RTFCs must have an account with the Administrator (see Chapter 2).

1.11 Certificates may be claimed for every litre (or equivalent) of sustainable renewable fuel supplied. Fuel from certain wastes or residues, fuel from dedicated energy crops, and RFNBOs are incentivised by awarding double the RTFCs per litre (or equivalent) supplied.

1.12 To be eligible for RTFCs, the renewable fuel must not have been counted and will not be counted under a UK renewable energy obligation other than the RTFO or any other support scheme in the UK, a European Economic Area (EEA) State or a group of EEA States that benefits the end supply of fuel such as feed-in tariffs or premium payments (see Chapter 6).

1.13 Data on the sustainability of fuel supplied must be independently verified before certificates will be awarded and the Administrator may require the evidence behind an application to be provided.

1.14 RTFCs may be traded on the open market. Any supplier of renewable fuels who owns the fuel at the 'duty point' or alternative assessment time may apply to receive RTFCs, regardless of whether or not they have an obligation under the Order.

1.15 Crop-derived biofuels are allowed to meet a supplier's obligation up to a maximum limit. This decreases year-on-year to reach 3% by 2026 and 2% by 2032. A specific target for 'development fuels' was introduced for the beginning 1 January 2019. Fuels that meet the definition of 'development fuel' can count towards either the main obligation or the development fuel target (see Chapter 3) and are awarded double 'development fuel' RTFCs (see Chapters 4 & 6).

1.16 Actions such as reporting fuel quantities, applying for RTFCs and redeeming RTFCs to meet the obligation are all undertaken through an IT system called the RTFO Operating System (ROS).

Relevant fuels and transport modes

1.17 The following non-renewable fuels are covered by the RTFO Order, where used in a relevant transport mode (see paragraph 1.19) in the UK:

- petrol
- diesel
- gasoil
- the non-renewable portion of any partially renewable fuel

1.18 The following renewable fuels are covered by the RTFO Order and eligible to receive RTFCs, where used in a relevant transport mode (see paragraph 1.19) in the UK:

- biofuel
- renewable fuels of non-biological origin (RFNBO)
- the renewable portion of any partially renewable fuel

1.19 The following relevant transport modes are covered by the RTFO Order:

- road vehicles
- non-road transports (see paragraph 1.20)
- aviation
- maritime, but only when the fuel used is a RFNBO (see paragraph 1.21)

1.20 For the purposes of the RTFO, “non-road transports” include the following transport modes:

- non-road mobile machinery (NRMM)[1]
- inland waterway vessels which do not normally operate at sea (see paragraph 1.21)
- recreational craft which do not normally operate at sea (see paragraph 1.21)
- alternatively powered trains that don’t already fall within the definition of NRMM (e.g. hydrogen fuel cell-powered trains)
- alternatively powered non-road vehicles which don’t already fall within the definition of NRMM
- tractors

1.21 For the purposes of this RTFO, an inland waterway vessel or a recreational craft which does not normally operate at sea is defined as those that do not normally operate beyond the limits of waters in the following categories of waters, as defined in Merchant Shipping Notice 1837 (M) Amendment 2:

- category A
- category B
- category C, excluding tidal rivers and estuaries

1.22 Maritime RFNBOs are defined for the purposes of the RTFO as RFNBOs which are used in ships, where ships are defined as vessels used in navigation that don’t fall under the definition of non-road transports (see paragraph 1.20). Inland waterway vessels and recreational craft which do not normally operate at sea are already

[1] NRMM is defined as any vehicle which falls within the scope of Regulation (EU) 2016/1628 and includes any mobile generator, machinery (including construction and loading vehicles), rail vehicle, inland waterways vessel (excluding ferries) or inshore pleasure craft (that does not need a maritime safety certificate) which makes use of an internal combustion engine.

included in the definition of non-road transports (see paragraph 1.20). In practice, this means that “maritime” refers to ships that normally operate at sea.

1.23 A wholly renewable fuel means one where all the energy content of that fuel originates from renewable sources. A biofuel is a type of renewable fuel where the feedstock is wholly biological. A RFNBO is a type of renewable fuel where all the energy of the fuel comes from the input process energy (with no feedstock energy), and all this process energy is from renewable sources other than bioenergy. A partially renewable fuel is one where part of the energy content of the fuel is from renewable sources and part is from non-renewable sources. Wholly and partially renewable fuels can be either liquid or gaseous. More information on fuel categories is provided in Chapter 4.

1.24 Renewable fuels that do not meet the carbon and sustainability (C&S) criteria of the RTFO (Chapter 7) are treated in the same way as fossil fuels and therefore become subject to an obligation for those suppliers that exceed the 450,000 litres reporting threshold. This is the case regardless of whether fossil fuels supplied to that transport mode are normally subject to an obligation which means, for example, that renewable aviation fuels that do not meet the C&S criteria are subject to the obligation even though fossil fuels used in aviation are not.

1.25 Fuels covered by the following HMRC duty types (code in brackets) are likely to be covered by the RTFO Order (however, any fuel covered by the descriptions in paragraphs 1.17 & 1.18 is covered, regardless of the HMRC duty type that duty is paid under):

- Unleaded petrol (522)
- Unrebated heavy oil (541)
- Gas oil (556)
- Biodiesel for non-road use (571)
- Biodiesel (589)
- Bioethanol (595)
- Aqua methanol (597)
- Natural gas including biogas (591) (only the biogas element of this duty code is covered by the RTFO Order)
- Road fuel gas other than natural gas (592) e.g. liquefied petroleum gas (LPG) (only the renewable gaseous element of this duty code is covered by the RTFO Order)
- Vapour recovery (524)

1.26 Fuels covered by the following HMRC duty codes may also be covered by the RTFO Order, depending on what use the fuel is put to.

- Other unrebated light oil (other than unleaded petrol) (520)
- Waste derived heavy oil (other than kerosene) (540)
- Kerosene, used off road or in an excepted vehicle (542)
- Fuel oil, used in an excepted vehicle or other off-road engine (561)
- Biodiesel gas blend (bioblend), used in an excepted vehicle, machine or appliance. (572)

1.27 Fuel additives and supplements are not covered by the RTFO Order.

Multipliers for specific fuel types

1.28 The RTFO operates on a volume basis when calculating obligations and awarding RTFCs. For a small number of fuel types, mostly gaseous fuels, a multiplier is applied when calculating the equivalent volume of renewable fuel for each kilogram or litre of the renewable fuel (see paragraph 1.29). If no multiplier is specified in paragraph 1.29, one kilogram of gaseous fuel is equivalent to 1 litre of renewable fuel.

1.29 The specified multipliers are as follows:

- each kilogram of methane is equivalent to 1.9 litres of renewable fuel
- each kilogram of butane or propane is to 1.75 litres of renewable fuel
- each kilogram of hydrogen regardless of application is equivalent to 4.58 litres of renewable fuel
- each kilogram of RFNBO ammonia used in maritime applications is equivalent to 0.66 litres of renewable fuel
- each litre of RFNBO methanol used in maritime applications is equivalent to 0.7 litres of renewable fuel

Civil penalties

1.30 The Administrator has powers to impose civil penalties in certain cases of non-compliance with the requirements of the RTFO Order including:

- failure to register with the Administrator if obligated
- failure to meet the obligation through either the redemption of RTFCs or the payment of the buy-out price
- failure to take reasonable steps to ensure that information provided to the Administrator is accurate

The Administrator may also apply interest to, and will collect, overdue civil penalties and buy-out payments.

1.31 The civil penalties policy is set out in full in Annex A:.

2. RTFO Accounts

Chapter summary

This chapter contains details of who should register with the Administrator, how to register, and the penalties for not doing so.

Requirement to register with the Administrator

2.1 Under the RTFO Order, any supplier that owns and supplies more than 450,000 litres (or equivalent – see paragraph 1.28) of fuel during an obligation year must register with the Administrator. This figure relates to the combined amount of fossil fuel, wholly renewable fuel and partially renewable fuel owned by the fuel supplier.

2.2 Fuel used in relevant transport modes (see paragraph 1.19) becomes subject to the RTFO at the point when the fuel becomes liable for excise duty in the UK - termed the 'duty point' - or, for fuels where there is no suitable duty point (i.e. renewable aviation turbine fuel, maritime RFNBOs, renewable gas used in non-road transports and renewable hydrogen), their alternative 'assessment times'[2].

2.3 If there is any uncertainty over whether a company is required to register, it is advisable to contact the RTFO Administrator.

2.4 Suppliers must have begun the process of opening an account within 28 days of having passed the 450,000-litre threshold within an obligation period. Obligation periods under the RTFO Order run from 1 January to 31 December.

2.5 If suppliers of less than 450,000 litres of renewable fuels wish to apply for RTFCs, they must first open an account with the Administrator.

2.6 As RTFCs are virtual certificates that exist only within the RTFO Operating System (ROS), any companies wishing to act as RTFC 'traders' (i.e. those who wish to own the RTFCs for onwards sale), must also open an account with the Administrator to be

[2] These assessment times are detailed in paragraphs 4.84 to 4.105.

able to access ROS. Companies that wish to facilitate RTFC trade, but who do not wish to own the RTFCs at any point, do not need to open an account.

2.7 Fuels that are physically present within the UK but have not crossed the duty point (i.e. are 'duty suspended') or alternative assessment time (for fuels eligible to claim RTFCs but without a suitable duty point) are not covered by the RTFO Order.

Penalties for failure to open an account

2.8 Obligated parties failing to begin the process of opening an account within 28 days of becoming obligated are liable for a civil penalty.

2.9 This is up to a maximum of £50,000 or 10% of their annual turnover (whichever is the lesser amount). See Annex A: for more details.

Applying for an account

2.10 Suppliers use the ROS system to submit information on the volume of fuel they supplied and (where relevant) the sustainability of those fuels. ROS is used to calculate a supplier's obligation, to record the issuing of RTFCs, to enable account holders to transfer RTFCs between themselves and to enable suppliers to redeem RTFCs to meet their obligation.

2.11 ROS is an online accessible database. Data submitted by suppliers is held within the Department's IT systems and is therefore subject to the same level of security and control as the Department's own data and information.

2.12 Those wishing to register for an account should contact the Administrator via rtfo-compliance@dft.gov.uk. Once the Administrator is satisfied that they have a valid reason for applying for an account, they will be provided with the website address (the URL) required to access ROS. For security reasons, the website URL is not published.

2.13 More information on how to open and manage a ROS account is available on request from the administrator.

Account refusal

2.14 The Administrator may refuse to open an account if an applicant is not considered to have a valid reason to hold an account, or if an organisation has refused to accept the conditions of application.

2.15 The Administrator will provide, in writing, the reason why the account has been refused.

Changing information concerning an account

2.16 All account holders are required to ensure that the information concerning their account is accurate. Most information can be updated by the lead user on the ROS system.

2.17 To change a nominated director, the lead user must provide the Administrator with either:

- the same information as was required for the original director
- a statement signed by both the incoming and outgoing directors to hand over the 'nominated director' role. The template to do this is available directly from the Administrator

2.18 The Administrator, after undertaking the necessary checks, will then alter these details for the account holder.

2.19 Companies House registration numbers may also only be altered by the Administrator. Evidence of this change will be required before an alteration is made. This will include a copy of the new incorporation certificate or other communication with Companies House.

Penalties for failure to maintain correct details

2.20 An account holder must ensure that all information concerning their account is correct and must inform the Administrator within 28 days of any of the information becoming incorrect.

2.21 Failure to maintain correct details may result in the account holder being liable for a civil penalty of up to £50,000 or 10% of turnover (whichever is the lesser amount). See Annex A: for more details.

Account closure

2.22 The Administrator must close an account when a non-obligated supplier:

- no longer has good reason to hold an account
- has withdrawn their consent to allow the Administrator to access premises and records

2.23 The Administrator may close an account when no certificates have been awarded or traded into the account in the preceding 36 months.

2.24 An account will not be closed where there are still certificates that can be redeemed against an obligation in the account.

2.25 If the Administrator considers that an account should be closed, the nominated director of the account will be notified of the reason in writing and will be given 14 days to object to this decision. If there is no response within 28 days, the account will

be closed. If a response is received, any representations will be considered, and a decision will be made and communicated to the recipient within a further 21 days.

2.26 If an account holder wishes to close their account, the nominated director of the company (or owner of a non-limited business) must write to the Administrator as soon as possible stating the reasons for the closure request. These reasons will be considered, and a response will be provided within 21 calendar days. The template to do this is available directly from the Administrator.

2.27 Once an account has been closed, the account will become inactive and users will be unable to access ROS. Data already recorded will be retained for 10 years and will continue to be reported as official statistics.

Reinstating a closed account

2.28 The Administrator may reinstate a closed account if the circumstances warrant this. Any such application will be dealt with on a case-by-case basis and the Administrator may require new copies of the evidence required at registration.

Consolidating an account

2.29 Accounts may be consolidated by the Administrator. The Administrator will do so where one transport fuel supplier has been wholly subsumed into another supplier.

2.30 The sale of assets used in the production or supply of transport fuels from one supplier to another will not be grounds for an account merger. If the original supplier continues to exist, it will still be an account holder under the RTFO Order and must discharge its duties accordingly.

2.31 Any supplier that expects to be in this position must contact the Administrator who will seek further evidence and provide guidance on a case-by-case basis.

3. The obligation and how it is met

Chapter summary

This chapter outlines the mechanism through which a fuel supplier's obligation is calculated and how the obligation can be met.

Minimum threshold

3.1 The RTFO Order places an obligation on any supplier of fuel for relevant transport modes (see paragraph 1.19) who supplies more than 450,000 litres (or equivalent – see paragraph 1.28) of total relevant fuel including both renewable and fossil fuel (see paragraphs 1.17 & 1.18) for use in the UK, in an obligation period.

3.2 Suppliers that supply less than this do not have an obligation.

Obligation periods

3.3 The RTFO operates on a calendar year basis. Obligation periods run from 1 January to 31 December each year.

Calculation of the obligation

3.4 The ROS system automatically calculates a supplier's obligation.

3.5 The obligation, which is comprised of the 'main obligation' and the 'development fuel target' is calculated from the obligated amount which is equivalent to the total volume of fossil fuel and unsustainable renewable fuel supplied, taking account of the multipliers outlined in paragraph 1.29. The obligated amount can be calculated by subtracting the total volume of sustainable fuel (see Paragraph 3.8) from the total volume of relevant fuel supplied. This amount is then multiplied by the obligation percentage for that period as set out in Table 2 below.

3.6 For suppliers whose obligated amount is between 450,000 litres and 10 million litres, there is no obligation on the first 450,000 litres supplied and this is therefore subtracted from the obligated amount.

3.7 The Administrator will round a supplier's obligation to the nearest litre.

3.8 The volume of sustainable fuel is the volume for which RTFCs have been issued after its sustainability has been proven. See Chapter 6 for information on issuing RTFCs and Chapters 7-9 for guidance on demonstrating compliance with the sustainability criteria. In practice, this means that the obligation is calculated from the volume of fossil fuel and renewable fuel that does not meet the sustainability criteria. The formal calculation of the obligation will occur after the last potential date for RTFC revocation as this is the point at which the amount of sustainable renewable fuel is known.

3.9 The values used to calculate a supplier’s target are Table 2 are expressed as a percentage of the obligated amount (see paragraphs 3.5 & 3.8). The obligation is also sometimes expressed as a percentage of total fuel. The relationship between these two sets of values is summarised in Annex B:.

3.10 A 'running calculator' is provided for suppliers during the year, which shows the volume of obligated fuel that a supplier has submitted and the amount of fuel that has been accepted as sustainable by the Administrator. To prevent confusion, fuel is regarded as sustainable only at the point that RTFCs are issued.

Development fuel target

3.11 A specific 'development fuel target’ is set under the RTFO Order. This target takes into account the fuel type, production pathway and feedstock, so as to incentivise those fuel pathways which need greater support and fit the UK's long-term strategic needs (see paragraph 4.75).

3.12 Suppliers are required to meet the developmental fuel target with 'development fuel' RTFCs that are issued to qualifying development fuels. RTFCs from a given year can be carried forward to meet up to 25% of a supplier's obligation in the following year.

3.13 The target level each year is set out in Table 2 below. Note that the targets include double counting, so the actual equivalent volume of development fuel supplied will be half this level. These targets, together with the main obligation, comprise the specified amount in Table 2.

Obligation period (1 Jan – 31 Dec)	Main obligation	Development fuel target	Total obligation
2023	13.078%	1.142%	14.220%
2024	13.563 %	1.379%	14.942%
2025	14.054%	1.619%	15.673%
2026	14.552%	1.863%	16.415%
2027	15.056%	2.109%	17.165%
2028	15.566%	2.358%	17.924%
2029	16.083%	2.611%	18.694%

Obligation period (1 Jan – 31 Dec)	Main obligation	Development fuel target	Total obligation
2030	16.607%	2.867%	19.474%
2031	17.138%	3.127%	20.265%
2032 onwards	17.676%	3.390%	21.066%

Table 2 The obligation trajectory. These percentages are converted to quantities by multiplying them by the obligated amount. The percentages for the 2021 obligation year are provided for information.

The crop cap

3.14 The RTFO Order sets an upper limit, by volume, on the contribution that crop-derived biofuels, excluding dedicated energy crops, can make towards discharging a supplier's obligation (referred to as the 'crop cap'). The level decreases year-on-year as set out in Table 3.

3.15 The feedstock information entered in ROS is used to automatically determine whether the fuel is subject to the crop cap. Suppliers should contact the Administrator when a new feedstock type would be required in ROS. The Administrator will then decide the appropriate classification on a case-by-case basis, based on the definition set out in paragraph 4.10.

3.16 RTFCs for biofuels derived from crops, excluding dedicated energy crops, are labelled as 'relevant crop' RTFCs. The maximum number of 'relevant crop' RTFCs that can be redeemed by each supplier is calculated alongside their obligation. It is calculated by multiplying the total volume of fuel supplied (including renewable fuel) by the relevant value in Table 3. Once this level has been reached, no further 'relevant crop' RTFCs can be redeemed by that supplier.

3.17 The rules for carryover under the RTFO Order apply to all RTFCs. Relevant crop RTFCs that are carried over count towards the following year's crop cap. Up to 25% of 'relevant crop' RTFCs permitted under the crop cap can be from the previous obligation period (see Chapter 6).

Obligation period (1 Jan – 31 Dec)	Crop cap value
2023	3.50%
2024	3.33%
2025	3.17%
2026	3.00%
2027	2.83%
2028	2.67%
2029	2.50%
2030	2.33%
2031	2.17%
2032 onwards	2.00%

Table 3 The crop cap. These percentages are converted into volumes by multiplying by the total volume of fuel supplied. The crop cap for the 2021 obligation year is provided for information.

Meeting the obligation

3.18 A supplier is required to discharge their obligation by either redeeming one RTFC per unit of obligation, or by paying a 'buy-out' price. Suppliers also have an obligation to supply a percentage of development fuels. The development fuel obligation is required to be discharged by either redeeming 'development fuel' RTFCs, or by paying the development fuel 'buy-out' price.

3.19 Suppliers will be notified of their obligation for an obligation period ahead of the redemption point. Suppliers will be notified shortly after the last issuing date for RTFCs, relating to the last possible submission period. In practice, this will be around 16 August following the obligation period in question.

3.20 Suppliers are required to redeem RTFCs by 15 September immediately after the obligation period in question.

3.21 The redemption facility on ROS is available for four weeks before that time and can be accessed via the RTFC account for that period's RTFCs.

3.22 A supplier can nominate which RTFCs they wish to redeem. Note that relevant crop RTFCs are only allowed to be redeemed up to the level of the crop cap. Development fuel RTFCs can be "over-redeemed" above the development fuel target level as these RTFCs can also be used to meet the main RTFO obligation.

3.23 The Administrator will calculate any buy-out as soon as is practicable after 16 September and inform the relevant suppliers by email.

3.24 Where a supplier fails to redeem sufficient RTFCs to meet their obligation they must pay a buy-out price of:

- 50 pence per RTFC that would otherwise be required to meet the main obligation
- 80 pence per development fuel RTFC that would otherwise be required to meet the development fuel target

3.25 This sum must be paid to DfT by 26 October following the end of the obligation period.

3.26 Where a supplier fails to make the buy-out payment by 26 October, interest will be payable on that sum at 5% per annum above the Bank of England base rate on 27 October. This interest will be applied daily.

4. Categorisation of renewable fuels and feedstocks

Chapter summary

A wide range of renewable fuels can be eligible for support under the RTFO. This chapter outlines how these fuels are categorised which, in turn, determines the amount and type of RTFCs received, as set out in Chapter 6.

Introduction

4.1 The categorisation of renewable fuels under the RTFO is mostly determined by the feedstock used in its production. Some fuels are also categorised based on the nature of the finished fuel.

4.2 The categorisation is important as it can affect the following:

- the type and number of RTFCs received per litre (or equivalent) of fuel supplied (see Chapter 6)
- which of the RTFO sustainability criteria have to be met and how the GHG emissions are calculated (see Chapter 7)
- the assessment time at which the fuel become eligible for RTFCs, covered later in this chapter

4.3 To ensure the correct treatment of each consignment of renewable fuel, reporting under the RTFO is required to take place on an individual feedstock and individual fuel-type basis.

4.4 Suppliers should be able to demonstrate for each consignment of fuel that the feedstock information provided is accurate. Relevant evidence can include reporting using an appropriate voluntary scheme and/or demonstrating a full chain of custody to the origin of the material (see Chapter 10).

4.5 This chapter provides guidance on how to categorise renewable fuels under the RTFO. It starts by defining the different feedstock categories before defining the eligibility criteria for development fuels, how partially renewable and co-processed fuels are dealt with, and the alternative assessment times for certain fuels.

4.6 Using the information contained in this chapter, suppliers should determine the following for a given consignment of fuel:

- whether the fuel is a renewable fuel
- what category of feedstock it is made from
- whether it is a partially renewable fuel and if so what proportion of the fuel is renewable
- whether the fuel qualifies as a development fuel
- the assessment time of the fuel

A decision tree to support this classification process is available in Figure 1.

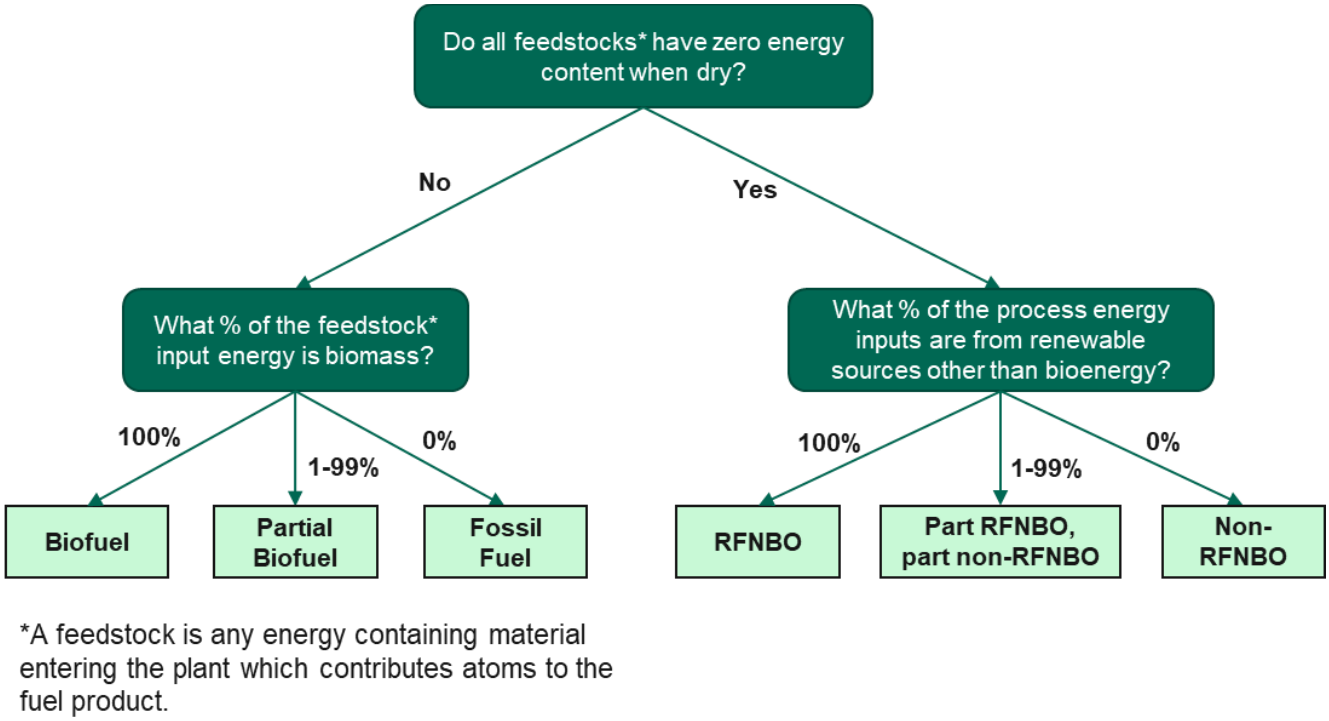

Figure 1 Classifying fuels based on their feedstock

Renewable fuel feedstock types

4.7 Renewable fuels supplied under the RTFO can be made from any of the following feedstock types:

1. Products of biological origin, which include relevant crops and energy crops.

2. Wastes and residues of biological origin, which can arise as a result of a production process or be derived directly from agriculture, aquaculture, fisheries or forestry.

3. Renewable sources other than biomass used to produce RFNBOs.

4.8 Renewable fuels made from feedstocks falling under 1 or 2 above are considered to be biofuels, while those made from non-biomass renewable sources are considered to be RFNBOs.

4.9 For the purposes of the RTFO, products are materials that are not wastes or residues and are single rewarded. In biofuel applications, these will typically, though not exclusively, be crop-derived materials and may also be materials that are produced at the same time as other products from a process (i.e. a co-product).

Relevant crops

4.10 Relevant crop feedstocks are defined according to the amended RTFO Order as starch-rich crops, sugars, oil crops and main crops, where “starch-rich crops” include:

- cereals (regardless of whether only the grains are used or the whole plant)
- tubers and root crops, including potatoes, Jerusalem artichokes, sweet potatoes, cassava and yams
- corm crops, including taro and cocoyam

4.11 Renewable fuels made from relevant crops are subject to the crop cap (paragraph 3.14). All dedicated non-food energy crops are excluded from the crop cap.

Energy crops

4.12 Dedicated energy crops are crops that 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 or energy
- are not a residue or a waste
- would not normally be used for food or feed

4.13 For the purposes of the RTFO, '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.

4.14 For the purposes of the RTFO, '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.

4.15 Biofuels derived from dedicated energy crops are double rewarded and are also required to comply with the land criteria (see Chapter 9). Biofuels produced from dedicated energy crops do not count towards the crop cap or the development fuel target.

Wastes and residues

4.16 According to the RTFO Order, the following relevant definitions apply:

- 'waste' means any substance or object which the holder discards or intends or is required to discard. This definition excludes substances that have been intentionally modified or contaminated for the purpose of transforming it into a waste.
- '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.
- '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.

4.17 The definition of residues from agriculture, aquaculture, forestry and fisheries, applies specifically to 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.

4.18 Wastes and residues may be eligible for double reward of RTFCs. Eligibility is determined on a case-by-case basis as determined by the Administrator through the assessment process outlined later in this chapter.

4.19 Agricultural wastes and residues are considered by the Administrator to be those that are derived directly from agricultural land and are subject to the land and soil carbon criteria (see Chapter 7).

4.20 Forestry wastes and residues are considered by the Administrator to be those that are derived directly from forested land and are subject to the forestry criteria (see Chapter 7).

4.21 Wastes and residues produced from agriculture- or forestry-derived materials but that only become a waste or residue during processing after collection from the land are likely to be classified as processing residues and therefore not subject to the land, forestry or soil carbon criteria.

Renewable fuels of non-biological origin (RFNBOs)

4.22 RFNBOs are renewable liquid or gaseous transport fuels for which none of the energy content of the fuel comes from biological sources. These fuels are considered renewable where the energy content of the fuel comes from renewable energy sources but excluding bioenergy sources[3]. This means that RFNBOs could be made using electricity and/or heat from wind, solar, aerothermal, geothermal or water (including hydrothermal sources, waves and tides). RFNBOs cannot be derived from

[3] Energy from renewable sources is defined as 'energy from renewable non-fossil sources, namely wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases'.

bioenergy sources and therefore would not be able to be derived from biomass, landfill gas, sewage treatment plant gas or biogases. As the available energy source of RFNBOs comes from electricity or heat, the input raw materials must contain no usable energy. In practice, this means that RFNBOs must be made from either water and/or carbon dioxide (CO_2).

4.23 The simplest RFNBO is renewable hydrogen (for example from wind or solar power electrolysis) that is directly used in transport applications: either in an internal combustion engine or a fuel cell electric vehicle. A range of other renewable transport fuels can also be generated by reacting this RFNBO hydrogen precursor with CO_2, to produce RFNBO products such as methane, methanol, ethanol, di-methyl ether, petrol, kerosene and diesel. It can also be reacted with nitrogen through the Haber process to produce renewable ammonia.

4.24 If a RFNBO is produced from CO_2, the carbon dioxide can come from waste fossil sources (for example, waste flue gases from coal and natural gas power generation or similar industrial combustion processes), from biological sources (e.g. alcohol fermentation or anaerobic digestion) or from atmospheric or naturally occurring/geothermal sources.

4.25 If the CO_2 is generated from fossil energy sources specifically for the purposes of producing transport fuel, this CO_2 must be accounted for as fossil CO_2 emissions in the reported carbon intensity of the RFNBO (see Chapter 3 of the RTFO RFNBO Guidance). Upstream supply-chain emissions associated with extracting, refining and transporting the fossil energy source must also be accounted for.

4.26 Where non-waste biogenic CO_2 is used to produce a RFNBO, the biomass used to produce the biogenic CO_2 is considered to be a feedstock. This feedstock must not have been generated specifically for the purpose of converting it into a fuel for use in transport. This means that:

- the biomass source must be a waste or residue and must meet the relevant sustainability criteria as set out in Chapters 7 and 9 – for example, forestry residues must meet the forest criteria
- any and all supply-chain emissions associated with the cultivation, collection, extraction and transport of the biomass source must be accounted for in the carbon intensity of the RFNBO

4.27 RFNBOs are incentivised under the RTFO by awarding double the RTFCs per litre (or equivalent in the case of gases) supplied.

4.28 Additional guidance for RFNBOs is provided in a separate guidance document available online.

Process for assessing and classifying feedstocks

4.29 The tables available separately on the Gov.uk website 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 renewable fuels at the time of publication.

4.30 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.

Assessment process

4.31 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@dft.gov.uk).

4.32 It is the responsibility of suppliers to demonstrate to the RTFO Administrator's satisfaction the appropriate classification of the feedstock. The Administrator will ask the supplier to provide information on the process that results in the material, its economic value and other uses. This information will be considered according to the principles set out in this guidance.

4.33 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 the appropriate classification of the feedstock for the purposes of the RTFO and the level of reward.

4.34 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.

4.35 Categorisations of materials will be applicable from the date of the RTFO Administrator's decision and applied to all renewable fuel from that feedstock supplied from that point forwards. Renewable fuel 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).

4.36 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 and is not applicable to the status of the material under any other government policy.

4.37 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.

Assessment principles

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

- products are generally materials that would be attributed GHG emissions for the purpose of calculating GHG default values (Chapter 8)
- materials that represent a significant economic value[4] 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

4.39 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[5].

4.40 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.

4.41 Should a feedstock meet the definition of a waste or residue as set out in the previous section, the Administrator will then decide whether the 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
- the environment generally

4.42 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.

4.43 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.

Classifying fuels made using algae under the RTFO

4.44 Algae are a broad family of typically photosynthetic organisms which can be used to produce biofuels. Where a supplier wishes to supply fuel derived from algae, they

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[4] The Administrator considers that materials typically trading for around 10% or more of the main product in £/tonne is an indicator of economic significance, but other factors may be taken into account, including the amount of material produced and its other uses.

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

should first contact the Administrator. Where necessary, a feedstock assessment will be undertaken (see paragraph 4.31).

4.45 Algae can grow in three different ways (Table 4). Typically, algae are “autotrophic”, meaning that they produce organic compounds (like oils and proteins) from simple carbon substrates like CO_2. As these carbon sources have no useful energy content, they derive energy from (sun)light through photosynthesis. Some kinds of algae can also take up and metabolise organic carbon from their surroundings. Certain algal species may be able to perform different types of growth depending on the conditions it is under (e.g. light vs dark, fed vs unfed).

Scenario	Growth Type	Energy source	Carbon source	Feedstock
1	(Photo)autotrophic	Light	CO2	Algae
2	Heterotrophic	Organic carbon	Organic carbon	The organic carbon source
3	Mixotrophic	Part light, part organic carbon	Part CO2, part organic carbon	See paragraph 4.48

Table 4 Types of algal growth

4.46 For the purposes of the RTFO, it is important to ascertain what the energy source is for the fuel that is produced and whether that energy source is organic carbon or not. This depends on the type of algae and how it grows under the conditions it is put in.

4.47 If the algae derive energy purely from light, then the algae itself would be considered the feedstock for the purposes of the RTFO (Scenario 1). Conversely, if the energy source is purely organic carbon, then the feedstock is whatever the organic carbon is derived from (e.g. a crop or waste) (Scenario 2). If a mix of light and organic carbon provide the energy, then the final product will need to be divided into two consignments as described in paragraph 4.48 (Scenario 3). Table 4 summarises these three situations and Figure 2 demonstrates how classification can be achieved through a flow diagram.

4.48 In situations where the energy content of the finished fuel is derived from both light and organic carbon (Scenario 3), then the final product should be split into two consignments:

- Consignment 1: Proportional to the energy coming from sunlight – for this consignment the feedstock would be algae
- Consignment 2: Proportional to the energy coming from the organic carbon source – for this consignment the feedstock would be whatever the organic carbon source is derived from

An energy allocation approach should typically be used for determining the proportion of the finished fuel which falls into each consignment. In line with the approach taken for partially renewable fuels, the Administrator will also consider alternative methods for allocation such as carbon dating on a case-by-case basis (see paragraph 4.62).

4.49 In situations where algae are not considered to be the feedstock (Scenario 2 or consignment 2 in Scenario 3), the status of the feedstock (e.g. as a waste, residue, relevant crop or energy crop) will be determined by the usual process with reference

to the published feedstock list or, where necessary, a new feedstock assessment (see paragraph 4.31).

4.50 Where the feedstock is considered to be algae (Scenario 1 or consignment 1 in Scenario 3), the Administrator will assess the feedstock type on a case-by-case basis. If grown intentionally for the purpose of producing renewable fuel, the Administrator would generally consider algae to be a single counting product. As it does not meet the definition of either a relevant crop or energy crop, it would be awarded a single general RTFC per litre of fuel supplied.

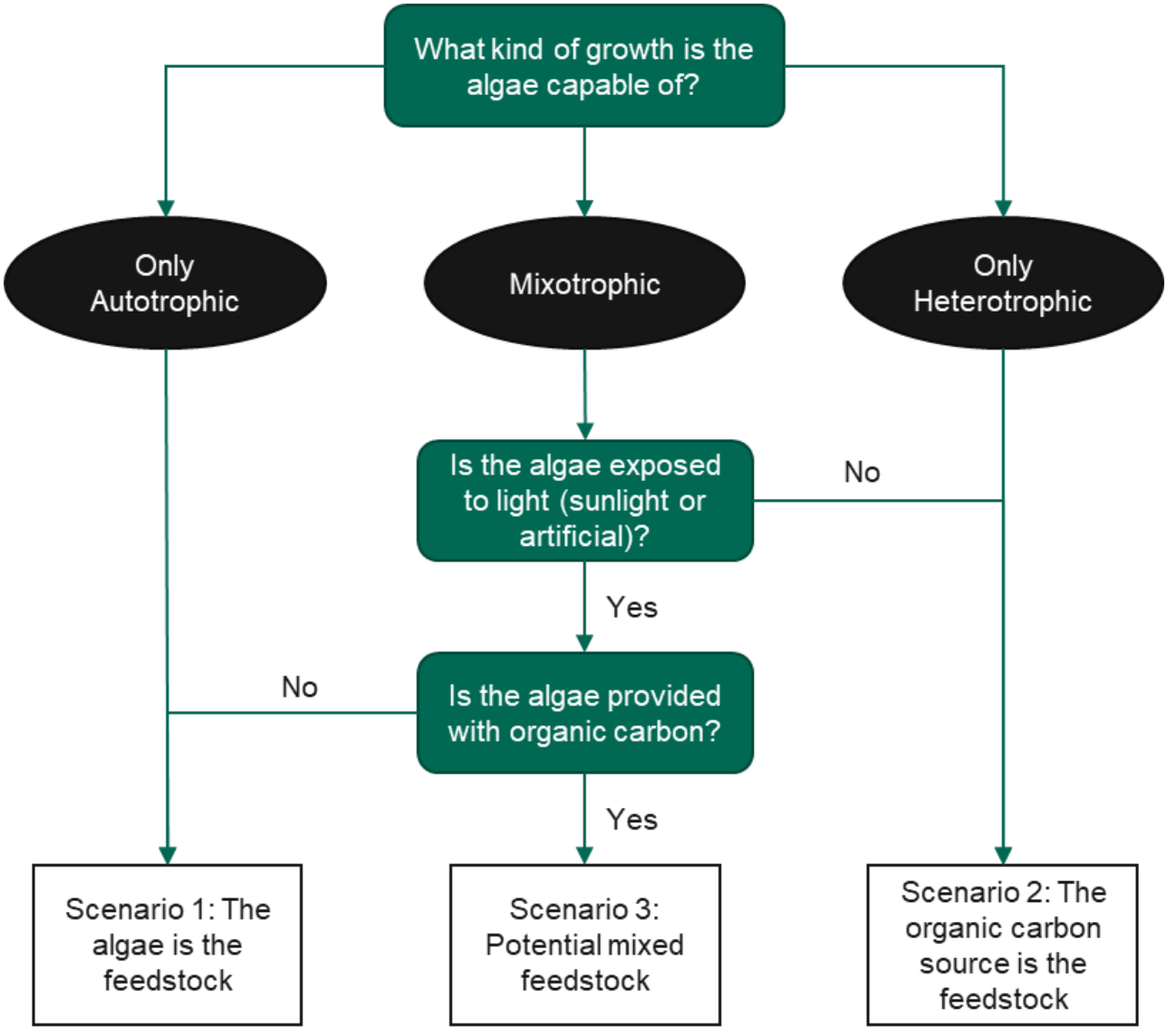

Figure 2 Flow diagram demonstrating how algae can be classified under the RTFO

Partially renewable fuels and co-processing

4.51 Some renewable fuel production processes involve both renewable and non-renewable feedstocks as inputs, for example:

- where a finished fuel or intermediate is produced by reacting compounds of renewable origin with compounds of non-renewable origin, resulting in a partially renewable fuel

- where intermediate products of fossil and renewable origin are co-processed together in the same refinery, resulting in a blend of renewable and non-renewable fuel

4.52 The guidance in this subsection explains how to calculate the volume of renewable fuel produced where a mix of fossil and renewable feedstocks are used as inputs to the process. Suppliers who blend multiple consignments of fuel together should instead follow the guidance on mass balance in Chapter 10 for assigning quantities of fuel to feedstocks.

4.53 In the case of partially renewable fuels, the renewable portion of the fuel is eligible for RTFCs and can count towards meeting a supplier's obligation if it meets the sustainability criteria (see Chapter 7). The non-renewable portion of a partially renewable fuel is not eligible for RTFCs and adds to a supplier's obligation (see paragraph 1.17). The RTFO Administrator considers that in the case of co-processed fuels, the non-renewable portion of the resulting fuel is a distinct fuel and therefore is only subject to an obligation if it is of an obligated fuel type (i.e. petrol, diesel or gas oil – see paragraphs 1.17).

4.54 The guidance in this section applies specifically to biofuels. Guidance on calculating the RFNBO portion of a fuel that is part RFNBO, part non-RFNBO is provided in a separate RFNBO-specific guidance document available online.

Calculating the amount of renewable biofuel produced by a process

4.55 Partially renewable and co-processed fuels do not have discrete volumes that are renewable or non-renewable. In order to determine how much of that fuel is eligible for RTFCs, the volume of the fuel has to be split into notional non-renewable and renewable portions that are treated as distinct consignments for the purposes of the RTFO.

4.56 The renewability of the product(s) is determined based upon the percentage (by energy) of all of the feedstocks to the production process that are of renewable origin. A feedstock is here defined as any energy containing material[6] entering a processing unit which contributes atoms to the fuel. Therefore, feedstocks include biomass and fossil inputs as well as any process chemicals that contribute atoms to the fuel.[7]

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[6] Inputs such as water and CO_2 are not considered feedstocks as they do not contribute any energy to the process.

[7] For example, in the case of hydroprocessing, hydrogen used to remove impurities such as sulphur would not be considered a feedstock and so should not be taken into account for the purposes of the calculation in paragraph 4.57 of the RTFO compliance guidance (unless it can be demonstrated that the hydrogen contributes atoms to the finished fuel). Conversely, hydrogen used to saturate the fuel does contribute atoms and so would be considered a feedstock and so should be taken into account for the purposes of the calculation in paragraph 4.57 of the RTFO compliance guidance. In uncertain cases, elemental analysis can be used to determine whether a hydrotreating step increases the hydrogen content of the finished fuel.

4.57 The renewability of the product(s) is then calculated using the following equation:

$$\text{MJ of renewable fuel} = \frac{\text{MJ of renewable feedstocks}}{\text{MJ of all feedstocks}} \times \text{MJ of fuel produced}$$

Where the energy within each feedstock in MJ is the feedstock mass flow over a given period multiplied by the respective feedstock lower heating value (LHV) over that period (taking account of water content, see paragraph 4.58). Figure 3 also illustrates this calculation for a simple example.

4.58 Where a feedstock contains water, the energy in MJ contributed by that feedstock should be calculated as follows:

$$\text{MJ of feedstock} = \text{Mass of material}_{wet} \times \text{LHV}_{dry} \times (1 - \%\ \text{water content})$$

4.59 The percentage renewability of HVO, FAME, ethyl tert-butyl ester (ETBE), methyl tert-butyl ester (MTBE) is defined in Article 4 of the RTFO Order (see Table 5). These values must be used when reporting the volume of renewable fuel produced via these processes. If a supplier's process for the production of one of these fuels differs from that defined in Table 5, the supplier should contact the RTFO Administrator.

4.60 Note that, for feedstocks that are a mix of renewable and non-renewable fractions, these should be treated as two separate feedstocks (one wholly renewable, one wholly fossil), each with their own LHV (MJ/kg) for the purposes of this renewability calculation. For example, 10 tonnes of municipal solid waste (MSW) should be treated as 6 tonnes of biogenic MSW with a LHV of 12 MJ/kg, and 4 tonnes of fossil MSW with a LHV of 18 MJ/kg (indicative values only), which on its own would produce a partial biofuel that was (6*12) / (6*12 + 4*18) = 50% renewable.

4.61 Where multiple products are produced in a process from a mix of renewable and non-renewable feedstocks, each co-product from the fuel production process should be assigned the same percentage renewability as the main product. This is illustrated in Figure 4.

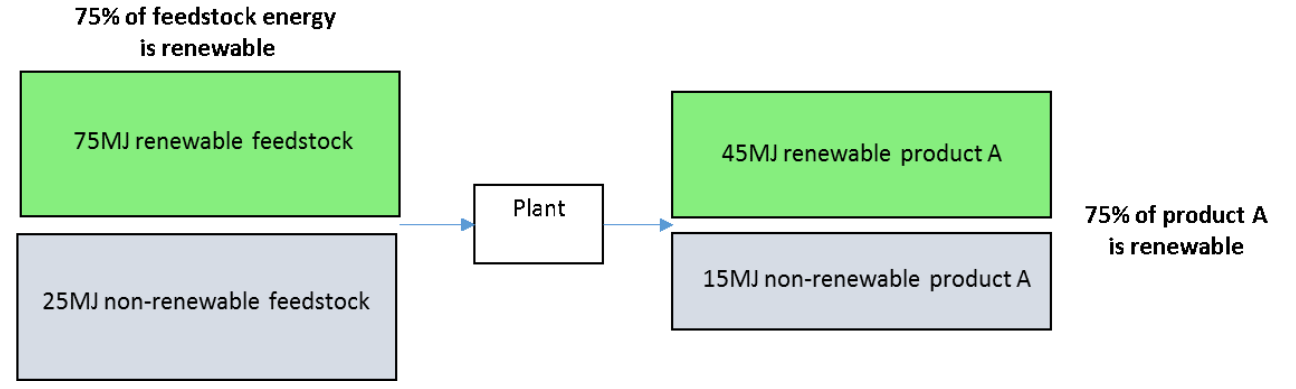

Figure 3 Calculating the amount of renewable fuel from a partially renewable fuel production process

Fuel	Production process	Renewability of fuel
Hydrotreated vegetable oil (HVO)[8]	Vegetable oils wholly from biological sources, hydrotreated with hydrogen (or methane) either wholly from fossil sources or from biomass - could be located at a refinery or as a standalone plant	100%
	Vegetable oils wholly from biological sources, co-processed with fossil crude oil in a refinery	Renewability of each product set using the equation in paragraph 4.57, considering the share of crude oil and vegetable oil inputs (on an energy basis)[9]
	Any other production process	Contact RTFO Administrator
Fatty acid methyl esters (FAME)	Transesterification of vegetable oils wholly from biological sources, with methanol either (i) wholly from biomass or (ii) from fossil sources	100%
	Any other production process	Contact RTFO Administrator
Bio-ethyl-tertiary-butyl-ether (Bio-ETBE)	Produced from ethanol wholly from biological sources and fossil isobutylene (2-methyl-propene)	47% (by volume)
	Any other production process	Contact RTFO Administrator
Bio-methyl-tertiary-butyl-ether (Bio-MTBE)	Produced from methanol wholly from biological sources and fossil isobutylene (2-methyl-propene)	36% (by volume)
	Any other production process	Contact RTFO Administrator
All other partially renewable fuels	Renewable feedstock only	100%
	Mixed renewable and non-renewable feedstock	Calculated according to equation in paragraph 4.57

Table 5 Renewability of partially renewable fuels

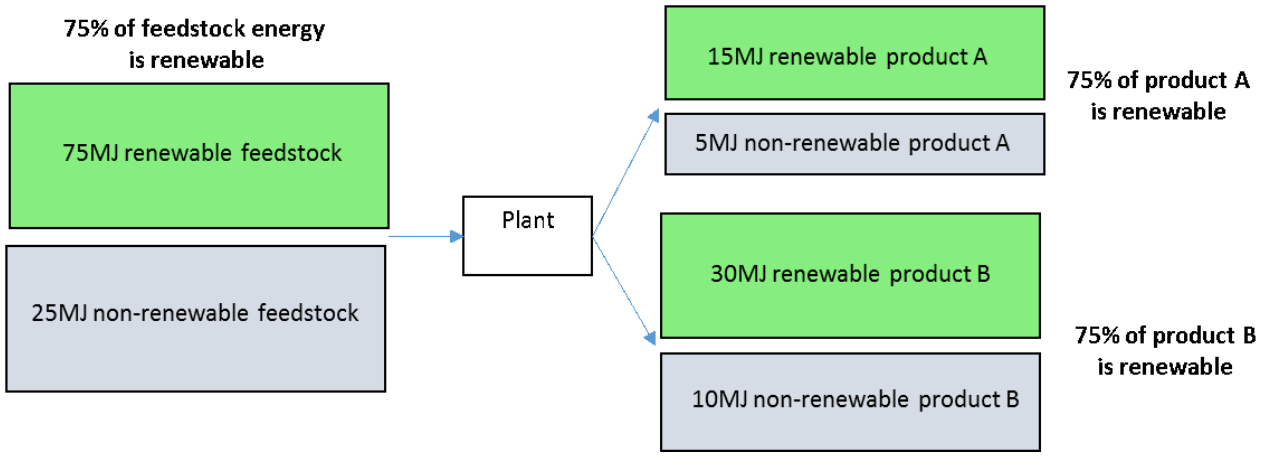

Figure 4 Calculating the amount of renewable fuel from a partially renewable fuel production process when there are multiple products / co-products

[8] HVO is sometimes referred to as hydroprocessed esters and fatty acids (HEFA), particularly in the context of aviation fuels.

[9] The fossil diesel component of the blended fuel is not eligible for RTFCs.

4.62 Where a supplier has an alternate method of allocating the proportion of renewability, the Administrator may consider this on a case-by-case basis. For example, radiocarbon (^{14}C) testing or yield-based methods[10]. However, radiocarbon (^{14}C) testing is however not always suitable for determining the renewability of the fuel produced (e.g. due to the variable ratio of carbon to hydrogen atoms in different feedstocks), so its use is subject to agreement with the RTFO Administrator.

Evidence required to demonstrate the proportion of renewable feedstock

4.63 The Administrator requires evidence as to the amount of renewable feedstock entering a partially renewable fuel production process. The Administrator will not issue RTFCs until satisfied that the percentage of that fuel that is renewable is correct. In order to report the % renewability of their products according to the equation in paragraph 4.57, suppliers must evidence the mass and LHV energy content of each feedstock entering the plant over the time period. If feedstocks enter the plant as a mixture of renewable and non-renewable material (e.g. mixed MSW) then suppliers must evidence the mass and LHVs of both the renewable and non-renewable components, as they are considered separate feedstocks for the purposes of the equation in paragraph 4.57.

4.64 The supplier must provide assurance to the Administrator that there is a Feedstock Measurement and Sampling (FMS) regime in place that allows the variability of feedstock characteristics to be known over time. Suppliers must have reached an agreement with the Administrator on the type of FMS to be employed before applying for RTFCs.

4.65 As part of the FMS regime, suppliers must agree with the Administrator how often the percentage renewability of their products must be re-calculated, and the evidence required to support this calculation. This re-calculation is likely to be required at least every three months for the first year that a supplier receives RTFCs, and will likely be more frequent if the relative mass flows or characteristics of the renewable feedstocks are highly variable. For characteristics that do not vary over time, fixed values can be used for each calculation. Future years might have less frequent re-calculation, but the Administrator may check the supporting evidence for any time period and reinstate more frequent re-calculations if appropriate.

4.66 The frequency of sampling required depends on whether these characteristics change over time. More frequent sampling will be required for production plants:

- with variable mass flows (e.g. operators controlling the fraction of renewable feedstocks they use)
- using feedstocks with LHVs that vary over time
- using feedstocks with a variable mass fraction of renewable and non-renewable components over time

[10] Yield-based methods involve using experimentation to establish the relationship between the inputs and outputs to a process. For example, a process could be run with and without the renewable feedstock and the difference in yields calculated to determine the relative contribution of the renewable feedstock to the outputs.

Assessing the sustainability of the renewable portion of partially renewable fuels

4.67 The calculated renewable portion of the partially renewable fuel is treated as a renewable fuel and subject to the same assessment of sustainability as wholly renewable fuels before RTFCs are applied for. Should this calculated volume of renewable fuel not meet the sustainability criteria then adds to, and cannot count towards meeting, the supplier's obligation.

4.68 For the purposes of sustainability reporting, every feedstock is considered to be a separate consignment, and any non-renewable feedstock is not included within the scope of the sustainability assessment. 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.

4.69 Assessment of the sustainability characteristics and GHG emissions of the renewable portion of the partially renewable fuel is outlined in Chapters 7-9.

Assigning renewability between different consignments of the same product

4.70 Renewability cannot be re-assigned between chemically different products[11] coming out of the process. For example, in Figure 4, none of the renewability of Product A can be assigned to Product B, so the operator cannot choose to generate more or less than 15 MJ of renewable Product A.

4.71 However, renewability can be re-assigned between different consignments of the same (chemically identical) product made from a partially renewable process. This means, for example, that if a process produces a product that is 75% renewable (based on the MJ of the input feedstocks), the supplier can choose to do one of the following:

1. Sell all of their product as 75% renewable (so that each 1 litre of fuel contains a 0.75 litres consignment of renewable fuel attracting, say, 1 RTFC per renewable litre).

2. Sell 75% of the product as a 100% renewable consignment (so that each 1 litre contains 1 litre of renewable fuel) and sell the remaining 25% of the product consignments as non-renewable consignments (so that each 1 litre contains 0 litres of renewable fuel), potentially in a different end market or outside of the UK. This gives the supplier flexibility to determine which markets its renewability should be rewarded by, rather than having to also sell the fossil fraction into the UK fuel market, potentially attracting an obligation.

4.72 Any re-assignment of renewability between chemically identical consignments of a given product is acceptable (e.g. the supplier could sell a particular product as 22%

[11] The term "product" is taken here to mean all outputs of the process, including products, co-products, wastes and residues. So, for example, renewability cannot be re-assigned between a solid residue and a liquid transport fuel product, as these are chemically different.

renewable if they wish), provided that the equation in paragraph 4.57 still holds true for the total amount of that product made at that facility.

4.73 For example, if a process uses 75% renewable feedstocks (based on the MJ of the input feedstocks) and produces ethanol and butanol, renewability can be assigned between different consignments of ethanol to produce some consignments of 100% bioethanol and some consignments of 100% fossil ethanol (because the fossil ethanol and the bioethanol produced in this process are chemically identical). However, renewability cannot be assigned between the ethanol and butanol: 75% of all butanol produced is renewable and 75% of all ethanol produced is renewable.

4.74 Once renewability has been assigned from the process, each consignment of each product must be sold with the appropriate renewability information. Downstream fuel mixing is subject to the usual mass balance rules (see Chapter 10), which provides another potential opportunity to change fuel renewability percentages, provided the total renewable mass output from the tank equals the total renewable mass input. Any fuel designated as non-renewable must not be sold as renewable fuel in an alternative market.

Development fuels

4.75 A 'development fuel' is a fuel made from certain (double rewarded) sustainable feedstocks specified in paragraph 4.76 that **is also** of one of the fuel types specified in paragraph 4.77.

4.76 To be classified as a development fuel, it must be one of the following:

- Made from sustainable wastes or residues which the Administrator considers are eligible for double RTFCs, apart from segregated oils and fats such as used cooking oil and tallow (see paragraph 4.78)
- A renewable fuel of non-biological origin (RFNBO) (see paragraph 4.22)

4.77 In addition to paragraph 4.76, A development fuel must be one of the following fuel types:

- Hydrogen
- Aviation fuel (avtur or avgas, see paragraph 4.79)
- Substitute natural gas - renewable methane produced from the product of gasification[12] or pyrolysis[13]
- A fuel that can be blended such that the final blend has a renewable fraction of at least 25%[14] whilst still meeting BS EN: 228 (for petrol, as revised or reissued

[12] “gasification” means the substoichiometric oxidation or steam reformation of a substance to produce a gaseous mixture containing at least two of the following: oxides of carbon, methane or hydrogen.

[13] “pyrolysis” means the thermal degradation of a substance in the absence of an oxidising agent (other than that which forms part of the substance itself) to produce char and at least one or both of gas and liquid.

[14] It should be noted that the minimum blend limit, of 25%, refers to the renewable fraction of the final fuel, not the fraction of the fuel that was blended with petrol or diesel. E.g. if a novel fuel is 50% renewable and is blended in equal parts with regular fossil diesel, the relevant fraction in this instance would be 25%.

from time to time) or BS EN: 590 (for diesel, as revised or reissued from time to time)

4.78 For the purposes of paragraph 4.76, 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. 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

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.

4.79 There are two types of aviation fuel:

- Aviation turbine fuel (avtur) is high specification kerosene used in jet and turboprop aircraft. This is not subject to fuel duty except when it is for 'private pleasure' use or put to non-aviation use.
- Aviation gasoline (avgas), also known as aviation spirit in the UK, is a high specification petrol used in spark-ignited piston engines. This is subject to fuel duty unless it is used in a commercial plane that exits UK air space, when the fuel becomes fully rebated.

4.80 Qualifying fuels are rewarded with double 'development fuel' RTFCs.

4.81 Suppliers wishing to apply for development fuel RTFCs should first contact the Administrator to request an initial assessment of the potential new development fuel production pathways against our requirements. The Administrator will then assess whether the fuel type, feedstock and production pathway meet the criteria for a development fuel and will use the information provided in RTFC applications to issue new 'development fuel' RTFCs accordingly.

4.82 In the case of novel fuels (i.e. those not specifically listed), the Administrator will need to be satisfied that the fuel meets the criteria, including that it can be blended such that the final blend has a renewable fraction of at least 25% whilst still meeting the relevant fuel standard (BS EN: 228/BS EN: 590).

4.83 The Administrator will need to be satisfied that the information contained within an application is accurate. Where deemed appropriate, the Administrator will validate this information itself. The Administrator will also have the power to require independent assurance to either a 'limited' or 'reasonable' assurance level using the standards set out in ISAE 3000 where it believes this is necessary.

Assessment times for renewable fuels

4.84 The point at which fuels are eligible for RTFCs is termed the 'assessment time'. This is also the point at which it must be demonstrated to the Administrator compliance

with the carbon and sustainability (C&S) criteria, and the point at which the obligation is calculated. To claim RTFCs, the assessment time must be located in the UK.

4.85 For fuels that are subject to fuel duty[15], the assessment time is the HMRC duty point (Hydrocarbon Oil Duties Act 1979 (HODA)).

4.86 For fuels without a suitable duty point in the UK, including renewable avtur, renewable hydrogen, RFNBOs used in maritime and renewable gaseous fuels in non-road transports an alternative assessment time must be determined. These assessment points, as well as the duty point for grid gas, are summarised below.

4.87 The required features of an assessment time are that:

- it happens only once
- there is documentation produced which can be used to validate claims
- it is clearly defined and well understood within the industry

4.88 It is preferable to use a point that already exists in administrative systems rather than creating a new point of control. In accordance with these principles, the Administrator has provided that the fuels without suitable duty points named in paragraph 4.86 have the following assessment times.

Grid gas duty point

4.89 This section concerns the point at which fuel duty becomes payable for gas supplied via a grid for use as a transport fuel. Suppliers intending to supply transport fuel via a gas grid must in the first instance contact HMRC to discuss the payment of fuel duty.

4.90 The duty point for methane supplied via gas grid pipelines is when the gas is sent out from the premises of the producer (or dealer) for use as fuel in a road vehicle; or when set aside for use as road fuel; whichever is the earlier. The point of “setting aside” takes place when it is decided that the gas is to be used as a motor fuel, this could be by physical separation or by way of an order being processed for road fuel gas at a depot.

4.91 In practice, this means that either the injector of the renewable gas into the grid or the extractor of the gas from the grid could be the duty payer. Therefore, either party, depending on where the duty point is, could be eligible for claiming RTFCs for sustainable renewable methane. It must be noted that only one claim for RTFCs can be made on a given parcel of gas; it is not permitted for both the injector and extractor to make claims for the same consignment.

4.92 Any supplier wishing to claim RTFCs for biomethane, or a fuel for which biomethane is a chemical precursor, should also refer to the RTFO Guidance for Biomethane. After reviewing the guidance, suppliers are also advised to contact the Administrator to discuss their specific requirements before submitting RTFC claims.

[15] Including Avgas. Please note that, for the purposes of the RTFO Order, the assessment time for all renewable hydrogen supplied for road transport is the point of sale.

Assessment time for renewable avtur

4.93 For avtur, the **blending and certification point** is used as the assessment time. This is the point where renewable fuel is blended with fossil fuel and certified to meet the appropriate finished aviation fuel specification, and a refinery certificate of quality (RCQ) is issued.

4.94 The main certification specifications used are Defence Standard 91-91, ASTM D7566, and ASTM D1655. These currently permit the blending of specified amounts of certain renewable fuels into fossil avtur, and then require that the resulting blend is certified.

4.95 This means that it will be the owner of the fuel at the point of blending and certification who is eligible to claim RTFCs and not necessarily the airline/user of the fuel.

4.96 As for other fuels, the renewable avtur must be supplied at or for delivery to places in the United Kingdom. Therefore, in order to be eligible for RTFCs, the owner of the fuel at the blending and certification point must provide evidence of an onward chain of custody to demonstrate that it has been delivered for use in a relevant transport mode in the UK. Evidence could take the following forms:

- bills of lading or equivalent transport documentation showing delivery to an airport
- where avtur has been transported via pipeline in the UK, proof of payment by airlines accompanied by evidence of transport up to, and including, entry into the pipeline
- other arrangements as agreed with the Administrator

Where the blending and certification point is outside of the UK, it is particularly important that evidence can be provided of transport to the UK.

4.97 Note that although avtur for private pleasure use is subject to fuel duty, the operation of two different assessment times for the same fuel could lead to the possibility of multiple claims for RTFCs. Therefore, under the Order, all avtur is subject to the alternative assessment time described in paragraph 4.93.

Assessment time for renewable hydrogen

4.98 Renewable hydrogen for transport use is a nascent industry, and supply chains tend to be simple. In general, hydrogen is produced on-site at the filling station and sold directly to the retail user.

4.99 For renewable hydrogen, the assessment time is the **point of sale** and so the owner of the hydrogen at this point is the entity eligible to apply for RTFCs. The “point of sale” in this context refers specifically to the point at which the renewable hydrogen is sold to a customer (whether commercial or retail) for consumption in transport applications and not for resale in the course of a trade or business.

4.100 For renewable hydrogen that is also classified as a maritime RFNBO, the assessment time specified in paragraph 4.102 should be used.

Assessment time for maritime RFNBOs

4.101 A maritime RFNBO is defined in paragraph 1.21 as RFNBOs which are used ships, where ships are, in practice, defined as vessels used in navigation that normally operate at sea.

4.102 The assessment time for a maritime RFNBO is the point at which it is dispensed for use in a ship. This means that the owner of the fuel at the point at which it is dispensed (i.e. the seller) is the entity eligible to apply for RTFCs.

Assessment time for renewable gases in non-road transports

4.103 Renewable gaseous fuel supplied for use in non-road vehicles are not subject to excise duty under HODA. An example is bio-LPG supplied for use in forklift trucks.

4.104 For these gases, the assessment time will be when/where the gaseous renewable fuel is 'set aside' for use in non-road transports. For bio-LPG, the Administrator considers this to be the point at which it is put into a liquid offtake container that is not intended for use in road vehicles or for heating.

4.105 In situations where it may not be clear where the assessment time occurs, please contact the Administrator.

5. Submitting fuel volume information

Chapter summary

This chapter contains details of how suppliers must submit data on the volume of fuel that they supply and how this will be assessed by the Administrator.

What to submit

5.1 Obligated suppliers are required to submit information on the volume (in litres for liquids, and kilograms for gasses) of all fossil, renewable or partially renewable fuels that are covered by the RTFO Order.

5.2 If a non-obligated supplier wishes to apply for RTFCs they must submit information on the volume of fuels that are covered by the RTFO Order. They are under no requirement to do so if they do not wish to apply for RTFCs.

5.3 The RTFO Order applies to fuels that a supplier owns at the duty point (or alternative assessment time for fuels without a suitable duty point - see Chapter 4) that are supplied at or for delivery to places in the UK for use in relevant transport modes (see paragraph 1.19). Where that fuel is subsequently supplied outside the UK, or for purposes other than for use in a relevant transport mode, that fuel is not covered by the RTFO Order.

5.4 All suppliers that submit volume information must provide information on (also see Figure 5 and paragraph 5.33):

a. the volume of fuel, by fuel type, that they owned at the duty point and paid duty upon (termed 'own lifts')

b. the volume of fuel, by fuel type that they owned at the duty point and another supplier paid duty on (termed 'lifts by others')

c. the volume of fuel, by fuel type that another supplier owned at the duty point but which they paid duty on (termed 'lifts from others')

d. the volume, by fuel type that they have paid to HMRC broken down by the form(s) (e.g. HO10, HO930, W50 etc.) on which the duty has been paid

e. for fuels without a suitable duty point, where the fuel is fully rebated or where there is a duty point but the RTFO Order specifies the use of a different assessment time, the volume of fuel, by fuel type that they owned at the assessment time (See Chapter 4 for relevant assessment times)

f. for fuels without a suitable duty point, the volume of fuel, by fuel type that another supplier owned at the assessment time (See Chapter 4 for relevant assessment time)

5.5 In the case of (b) or (c), the fuel quantities must be broken down by each supplier that a lift to/from has occurred with and reported by both parties. A volume cannot be validated until both parties agree to it. Where a supplier pays all of the duty on the fuel that it owns at the duty point and does not pay any duty on fuel owned by any other party at the duty point, then only the data under (a) and (d) is required.

5.6 Where a supplier subsequently removes the fuel from the UK transport fuel market, and where that fuel volume is confirmed by HMRC, the Administrator will not normally require any further evidence from that supplier that this is the case. However, the Administrator may require evidence where there are concerns that the fuel is either not being recorded for HMRC purposes with the correct split of fossil and renewable transport fuel, or that the fuel in question should have counted towards the RTFO.

5.7 In practice, this means that the Administrator will regard the fuels which the RTFO Order applies to as being those quantities of fuel which a supplier is liable to pay duty on - i.e. the 'net' figure of duty liability minus duty reclaim. This means that where fuel is supplied as road fuel by one supplier (A) and then 'marked' for off-road use by another supplier (B), supplier A will be obligated on this fuel as road fuel and supplier B will have a net-zero obligation (as the amount of road fuel deducted will equal the amount of non-road fuel supplied).

5.8 Where a subsequent supply of fuel for non-UK uses results in a duty payment to HMRC becoming 'negative' for a given fuel type (i.e. the duty reclaimed exceeds any duty liabilities), the supplier must inform the Administrator and advice will be given on a case-by-case basis as to how this fuel should be recorded.

5.9 Where a supplier declares that a fuel is not covered by the RTFO Order, and where no duty rebate has been claimed, the Administrator will examine this on a case-by-case basis. The Administrator may require the supplier to provide evidence that this is the case.

5.10 To facilitate administration, we expect that the monthly submissions to the Administrator should match the net duty payments to HMRC. When fuel crosses the duty point as relevant transport fuel in one month and duty is reclaimed in another (due to the time lag of making duty reclaims against the determination of an amount to be included in a monthly duty payment), deductions from the submission to the Administrator should be made in the month when the duty is reclaimed from HMRC.

5.11 Where the fuel is originally supplied for UK use in one obligation period and then subsequently supplied for non-UK use in another obligation period, the supplier should inform the Administrator of the fuel types and quantities concerned. The Administrator will determine, on a case-by-case basis, how this fuel should be recorded in the obligation periods concerned.

5.12 Where this subsequent supply for non-UK use across obligation periods is part of a regular series of fuel movements and the overall effect on an obligation period would be balanced at either end of the period, the Administrator will not normally require this fuel to be recorded across different obligation periods.

5.13 When submitting fuel quantities to the Administrator, suppliers should report fuel quantities by fuel type, as they are outlined in ROS. Where an HMRC duty code always covers only either a fossil fuel or a renewable fuel, the ROS codes will match the HMRC duty codes. Some HMRC duty codes cover different fuels, and, in some cases, this can cover both fossil fuels and renewable fuels. For example, the HMRC duty code for heavy oil covers both fossil diesel and renewable diesel (i.e. HVO). In these instances, there will be a separate code in ROS for the different fuel types and suppliers should report their fuel quantities accordingly.

5.14 If a non-obligated supplier does not supply any fuel in a reporting period, we do not require them to submit a 'zero' return.

Denaturant in bioethanol

5.15 For ethanol denatured in the UK, HMRC requires a 1% denaturant level (of either petrol (TSDA 10) or denatonium benzoate (TSDA 9)).

5.16 As petrol is covered by the obligation, any petrol used as TSDA 10 is subject to an obligation and must be recorded on ROS.

5.17 As fossil methanol is not covered by the obligation, any supplied as TSDA 9 is not subject to an obligation and therefore should not be recorded on ROS. You may need to provide supporting evidence to reconcile this with HMRC duty payment data.

5.18 The Administrator will not require any further proof of the volume of denaturant supplied, where a 1% denaturant level is submitted for ethanol denatured in the UK. For ethanol denatured outside of the UK, suppliers must submit the relevant amount of denaturant and provide proof of the level used.

Partially renewable biofuels and part RFNBO, part non-RFNBO fuels

5.19 The reported quantities of partially renewable biofuels should be split into the renewable and fossil elements as outlined in Chapter 4. The Administrator will create 'renewable element of partially renewable fuel' and 'fossil element of partially renewable fuel' fuel types on ROS which these fuels should be submitted under, e.g. 'the renewable part of ETBE' and 'the fossil part of ETBE'. Note that any bioenergy or nuclear energy used in making a part RFNBO, part non-RFNBO fuel has to be recorded in the 'fossil element of partially renewable fuel' fuel type. The reported quantities of a part RFNBO, part non-RFNBO fuel should therefore be split into corresponding 'renewable element of partially renewable fuel' (i.e. RFNBO) and 'fossil element of partially renewable fuel' (i.e. non-RFNBO).

5.20 The percentage renewability of the products must be reported each time a supplier applies for RTFCs. The total amount of renewable fuel reported to the Administrator

must not exceed the total amount of renewable fuel produced in a given time period, regardless of the sampling frequency.

5.21 Suppliers should submit information on the volume of renewable fuel supplied and the percentage[16] renewability of the process. Suppliers are encouraged to provide this information to the Administrator in sufficient time for the Administrator to make an assessment. The length of time this assessment takes will depend upon the complexity of the production pathway.

5.22 When reporting quantities of fuel to the Administrator, calculations to determine the volume of renewable fuel and fossil fuel from a partially renewable fuel production process should be rounded to the nearest litre.

5.23 If a supplier of a partially renewable fuel wishes to report just the renewable portion to the Administrator, for example, due to selling the non-renewable portion(s) of that fuel into different market sectors, they will need to inform the Administrator.

5.24 How the fossil element should be entered will depend on how HMRC requires the duty paid on that fuel to be recorded. As HMRC's recording of partially renewable fuels develops, the Administrator will inform suppliers as to how to record the fossil element of a particular partially renewable fuel.

5.25 Where a supplier wishes to confirm their approach, they can contact the Administrator at rtfo-compliance@dft.gov.uk.

Determining the end use of gas oil

5.26 The RTFO Order contains a presumption that low sulphur gas oil and off-road biodiesel is for use in NRMM unless a supplier can satisfy the Administrator to the contrary. This is to minimise administrative burden by not placing a requirement on a supplier to know the end use of their gas oil supply.

5.27 Off-road biodiesel will be eligible for RTFCs, where duty has been paid (HMRC duty code 571), provided the Administrator is satisfied that the fuel has met the sustainability criteria.

5.28 Whilst HMRC's duty code marked gas oil (556) can contain both high sulphur gas oil and low sulphur gas oil which is for NRMM and non-NRMM end uses (such as stationary generators), the presumption set out above means that the RTFO Administrator will assume that all fuel dutied under this code is obligated unless the contrary can be demonstrated to the satisfaction of the Administrator.

5.29 Suppliers who produce high sulphur gas oil should contact the Administrator to discuss what evidence can be provided to demonstrate that this fuel is high sulphur gas oil. As the presumption of NRMM use does not apply to high sulphur gas oil, this fuel will only be obligated should there be evidence that the fuel was used in a

[16] Where the partially renewable fuel is a gas, the percentage should be on a mass basis, and the amount of renewable fuel on a kilogram basis.

relevant transport mode (see paragraph 1.19). Any such use is likely to be in contravention of the Motor Fuel Regulations.

5.30 Where a supplier wishes to rebut the presumption that low sulphur gas oil or off-road biodiesel are used in NRMM, they must provide evidence specific to the fuel they supply.

5.31 The Administrator will continue to work with suppliers to determine what that evidence should consist of and will issue a clarification on either a case-by-case or industry-wide basis.

How the Administrator validates supplier submissions

5.32 In operating the RTFO it is essential to be able to check that data reported by fuel suppliers is accurate, particularly in relation to the volume of obligated fuel and the number of RTFCs to be issued. The Administrator's process to verify that volume data is correct is termed 'validation' to distinguish it from the verification of C&S information by independent verifiers.

5.33 The principal method that the Administrator uses to validate volume submissions is to check a supplier's submitted figures against HMRC duty payment data. Figure 5 and Figure 6 show how this is done when duty is paid on a duty deferred basis. Also see paragraph 5.4.

5.34 Where a fuel volume is not checkable against HMRC data, for example where a single duty code covers both fossil and renewable elements or where a supplier is claiming that a volume that has been charged road transport duty is not in fact used in a relevant transport mode (see paragraph 1.19), or for fuels without a suitable duty point, the Administrator will validate this volume in one of the following ways:

- by requiring the supplier to provide evidence for each and every submission
- by assessing the systems and processes that the supplier uses to derive these quantities on a periodic basis and with the supplier providing assurance to the Administrator that these systems have been used for each submission
- by requesting that a supplier obtains independent verification of the quantities (See the Third-Party Assurance Guidance)

5.35 Which approach is used, and the details of that approach, will be determined on a case-by-case basis and will depend upon the complexity and nature of the issue.

5.36 In some cases, the Administrator may choose to validate data despite discrepancies if those discrepancies are deemed to be trivial or legitimate. These may include cases where there are differences between:

- a supplier's declaration and HMRC duty payment data
- two suppliers' declarations where fuel has been deferred from one duty account to another

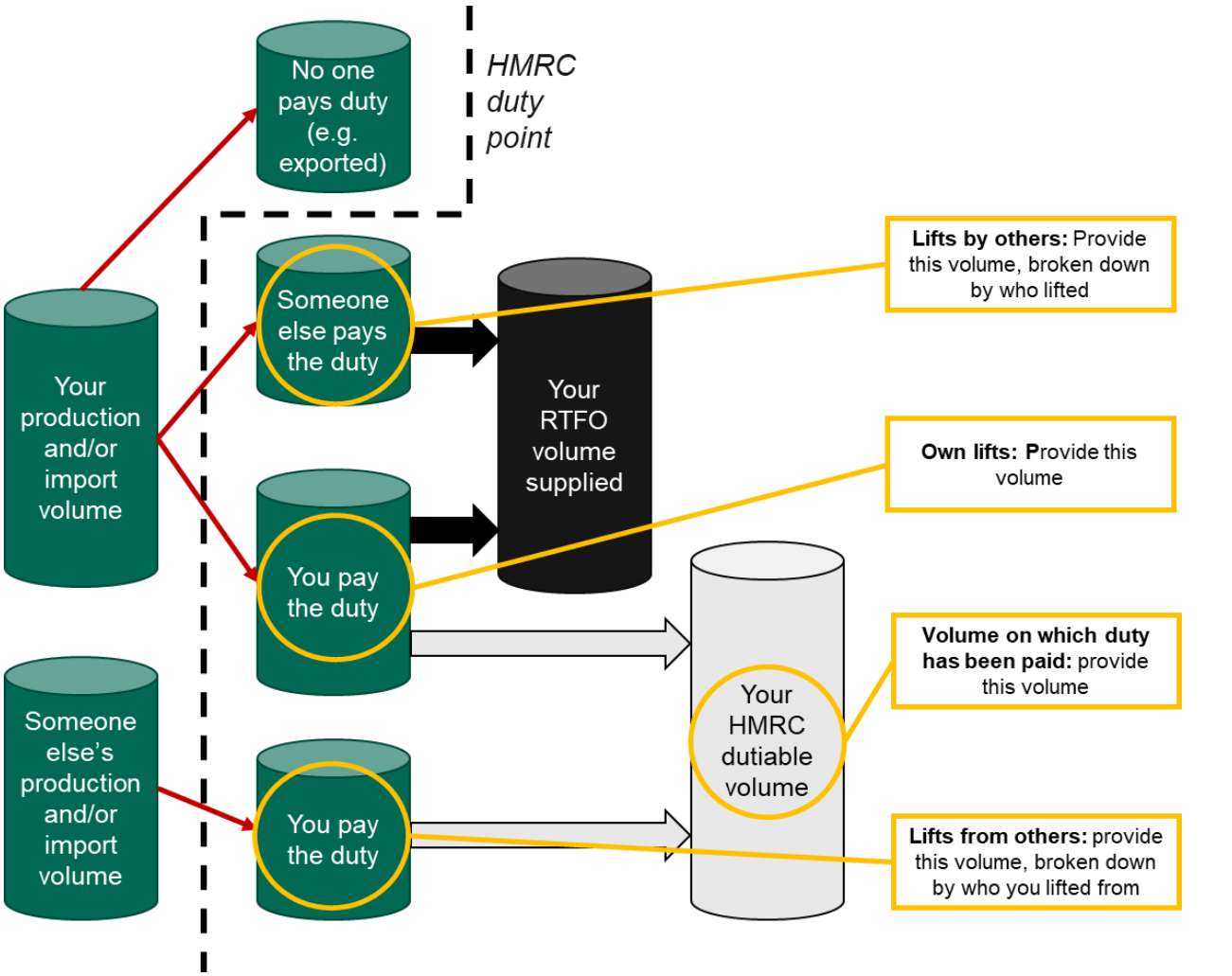

Figure 5 How duty deferring relates to the duty points and what data suppliers need to report to the Administrator in order to validate RTFO volumes.

Additives

5.37 Additives are not covered by the RTFO Order (see 5.15 for details on denaturants).

5.38 Where a supplier blends additives at the duty point and pays the duty upon them, these do not need to be added to a supplier's obligation. As the quantities supplied each month are small, a supplier may choose to report them during the obligation period and then deduct the total amount supplied in the obligation period from the last reporting period. Proof, as set out in section 5.34, will be needed for this volume.

Energy content

5.39 As the RTFO standard data provides energy content (by volume for liquids and mass for gases) for most fuels that will be covered by the RTFO Order, we do not require suppliers to submit this, unless:

- the fuel is not listed in the RTFO standard data
- the supplier is aware that the energy content of their fuel is significantly different to that in RTFO standard data

5.40 If a supplier is aware of this, they must inform the Administrator in writing to: rtfo-compliance@dft.gov.uk.

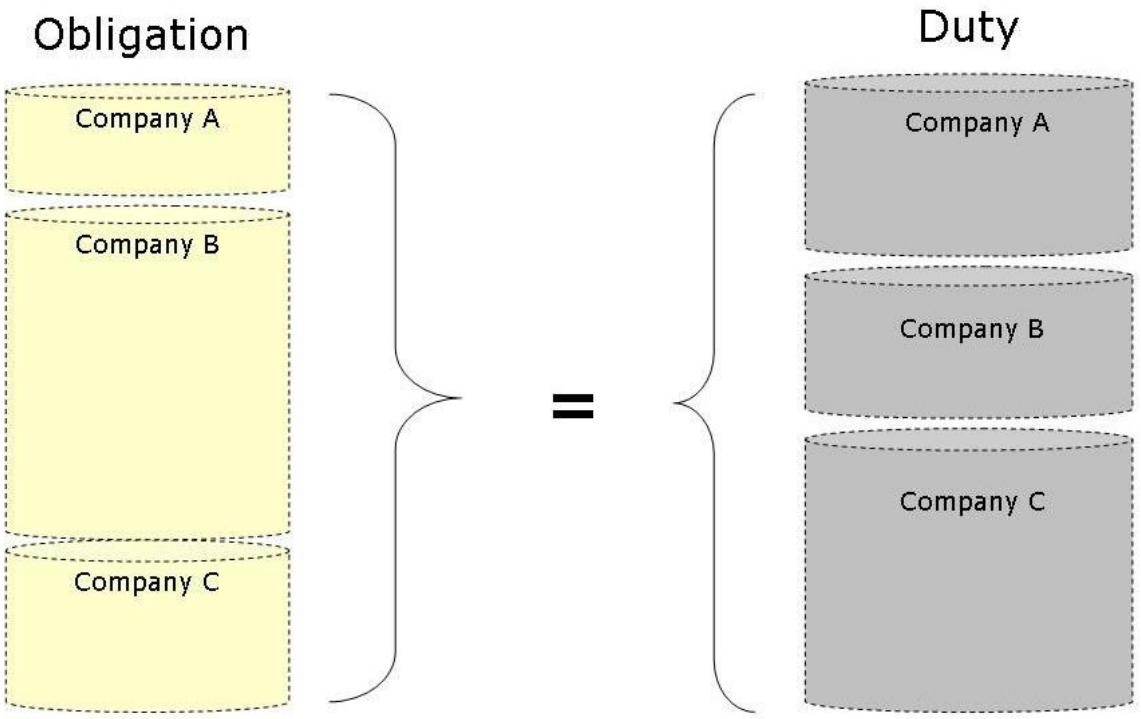

Figure 6 How the duty deferral process outlined in Figure 5 allows cross-checking

Reporting timetable

5.41 Companies who report to HMRC using the HO10 duty form submit fuel volume information to the Administrator on a monthly basis for a period beginning on the 15th of one month to the 14th of the next. The submission to the Administrator for this period should be made by the end of the 14th of the month after the one in which the report is submitted to HMRC. For example, for the fuel supplied from 15 September to 14 October, this will be reported to HMRC by 31 October, and then this in turn must be submitted to the RTFO Administrator by 14 November. When the 14th falls on a weekend or bank holiday, submissions must be made by the previous working day.

5.42 Companies who report to HMRC using the HO10 duty form who also report to HMRC on other forms, e.g. W50, or using the Customs Declaration Service[17], should submit the fuel quantities to the Administrator with the submission for the month that includes the last day covered by the form: e.g. REDS duty payment covering July (1 - 31) will be reported on ROS in the period 15 July to 14 August, as 31 July falls within this period.

5.43 Companies who report to HMRC using the HO930 form on a **monthly** (calendar month) basis submit fuel volume information to the Administrator on the same monthly basis. The submission to the Administrator must be made by the end of the 14th of the month (or previous working day) after the one in which it is reported to

[17] Note that the CHIEF system has been replaced by the Customs Declaration Service.

HMRC. For example, for the fuel supplied in the month ending 30 September, which is reported to HMRC by 31 October, a submission should be made to the RTFO Unit by 14 November.

5.44 Companies who report to HMRC using the HO930 form on a **quarterly** basis submit fuel volume information to the Administrator on a quarterly basis. The submission to the Administrator must be made by the end of the 14th of the month (or previous working day) after the one in which it is reported to HMRC. For example, for the fuel supplied in the quarter from 1 July to 30 September, which is reported to HMRC by 15 October, a submission can be made to the RTFO Unit by 14 October.

5.45 Companies who report to HMRC using other forms on a calendar month basis only, must submit fuel volume information to the Administrator on a calendar month basis in line with the rules for HO930 monthly reporters as set out in 5.44. This excludes those companies covered by 5.42.

5.46 Companies who report to HMRC using W50 or any other form not discussed above should contact the Administrator for advice as to how to submit fuel volume information.

5.47 Table 6 below shows an example of when different companies should report.

Mid-month to mid-month duty payments			**Calendar month duty payments**			**Quarterly duty payments**	
	Period end	Reporting deadline		Period end	Reporting deadline	Quarter end	Report deadline
1	14/01/aa[2]	14/02/aa					
2	14/02/aa	14/03/aa	1	31/01/aa	14/03/aa		
3	14/03/aa	14/04/aa	2	28/02/aa	14/04/aa		
4	14/04/aa	14/05/aa	3	31/03/aa	14/05/aa	31/03/aa	14/05/aa
5	14/05/aa	14/06/aa	4	30/04/aa	14/06/aa		
6	14/06/aa	14/07/aa	5	31/05/aa	14/07/aa		
7	14/07/aa	14/08/aa	6	30/06/aa	14/08/aa	30/06/aa	14/08/aa
8	14/08/aa	14/09/aa	7	31/07/aa	14/09/aa		
9	14/09/aa	14/10/aa	8	31/08/aa	14/10/aa		
10	14/10/aa	14/11/aa	9	30/09/aa	14/11/aa	30/09/aa	14/11/aa
11	14/11/aa	14/12/aa	10	31/10/aa	14/12/aa		
12	14/12/aa	14/01/bb	11	30/11/aa	14/01/bb		
13	31/12/aa[2]	14/02/bb	12	31/12/aa	14/02/bb	31/12/aa	14/02/bb

Table 6 Reporting dates for obligation periods running 1 January to 31 December in year 'aa'.

5.48 This section does not deal with the timelines for submission of C&S data to receive RTFCs. This is dealt with in Chapter 6.

5.49 The RTFO obligation year runs from 1 January to 31 December. To enable HO10 suppliers to report on a mid-month to mid-month basis there is an additional 'month 13' for HO10 suppliers to report fuel quantities supplied between 15 and

31 December. Applications for both the period 15 December to 31 December and 1 January to 14 January the following year should be made by 14 February.

5.50 Where suppliers are splitting fuel from one HMRC reporting period, such as at the beginning and end of a calendar year where the RTFO reporting period does not match the HMRC reporting period, suppliers may split their fuel quantities proportionally (e.g. a 50/50 split). The Administrator will validate the total fuel quantities over the period against HMRC data and may require additional evidence regarding any non-proportionate split of the fuel volume across the two RTFO reporting periods.

6. Renewable Transport Fuel Certificates

Chapter summary

This chapter contains details on:

- how RTFCs should be applied for
- how they will be issued
- how carry-over of RTFCs to subsequent obligation periods works
- when RTFCs will be revoked

The Third-Party Assurance Guidance should be referred to alongside this chapter.

Which fuels are eligible for RTFCs

6.1 The total amount of a wholly renewable fuel, the portion of a partially renewable biofuel that is derived from biomass feedstocks, and the portion of a part RFNBO, part non-RFNBO fuel that is derived from (non-bioenergy) renewable energy sources (see Chapter 4), is eligible for RTFCs, provided it has been proven, to the Administrator's satisfaction, that they have passed the sustainability criteria.

Requirements before an application for RTFCs can be made

6.2 To apply for RTFCs, a supplier must:

- have submitted, or intend to have submitted by the first possible RTFC issuing point, sufficient fuel volume data, which the Administrator must have validated (See Chapter 5)
- submit C&S information that demonstrates that the fuel has met the sustainability criteria and submit a verifier's assurance report attesting to this (See Chapter 7 for details on the C&S requirements and Third-Party Assurance Guidance for details on the verifier's assurance report)
- meet other stipulations under the RTFO Order, as outlined in Chapters 1, 2 & 5. These include: having an account with the Administrator; being the owner of the fuel at the duty point (or equivalent assessment time for fuels which are not

subject to duty); having paid all duty that is liable on the renewable or partially renewable fuels to HMRC; having supplied the fuel at, or for delivery into, the UK for use in a relevant transport mode (see paragraph 1.19)

Multiple incentives

6.3 To be eligible for RTFCs, the renewable fuel or any chemical precursor to that fuel must not, at the time of application or at any time in the future, be:

- counted under a UK renewable energy obligation other than the RTFO
- counted under any other support scheme of the UK, a European Economic Area (EEA) State or a group of EEA states that benefits the end supply of fuel such as feed-in tariffs or premium payments

Except where the exclusions outlined in paragraph 6.6 apply.

6.4 For the purpose of the RTFO, and specifically paragraph 6.3, “support scheme” means any instrument, scheme or mechanism[18] applied by the UK or any EEA State or group of EEA States that promotes the use of energy from renewable sources by at least one of the following:

- reducing the cost of that energy
- increasing the price at which that energy can be sold
- increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased

6.5 For the purpose of the RTFO, and specifically paragraph 6.3, “renewable energy obligation” means a scheme requiring at least one of the following:

- energy producers to include a given share of energy from renewable sources in their production
- energy suppliers to include a given share of energy from renewable sources in their supply
- energy consumers to include a given share of energy from renewable sources in their consumption

6.6 However, paragraph 6.3 does not apply to either of the following situations:

- investment aid benefitting the production plant in which the renewable transport fuel was produced, such as financial support to develop fuels and technologies (e.g. laboratory-scale testing) or support for the construction of demonstration-scale production, whether situated in the United Kingdom or elsewhere
- the reduction in any duty payable in the United Kingdom under the Hydrocarbon Oil Duties Act 1979

[18] “Instrument, scheme or mechanism” includes investment aid, tax exemptions or reductions, tax refunds, renewable energy obligations, and direct price schemes including feed-in tariffs and sliding or fixed premium payments.

6.7 Suppliers are required to declare that the fuel upon which they are claiming RTFCs, or any chemical precursor from which that fuel was produced, meets the requirements of paragraph 6.3. This means, for example, that a supplier must not apply for RTFCs if an application has been made or will be made to Ofgem under the Renewable Heat Incentive or Renewables Obligation in relation to that fuel or a chemical precursor to that fuel.

Timeline for applications

6.8 Once the above requirements have been met, including that the Administrator is satisfied with the accuracy of the information demonstrating compliance with sustainability criteria[19], suppliers will be able to claim RTFCs on ROS at any time.

6.9 Suppliers may apply for RTFCs at any time but must apply by the cut-off date of 14 May (or a later date if specified by the Administrator), after the end of an obligation year.

The flow of information before and during the application process

6.10 The flow of information between the supplier, verifier and administrator is facilitated on ROS. ROS performs logic checks to flag any data that suggests a renewable fuel has not met the sustainability criteria. The details of how ROS works are contained on the ROS help screens.

6.11 The submission for RTFCs occurs at the level of bundles of individual applications. Each ‘application’ must correspond to a volume of fuel that has homogeneous sustainability characteristics, as set out in Chapter 10. A bundle is one or more applications that a supplier has sought a verifier's assurance report on (see the Third-Party Assurance Guidance for further information on verification of the C&S data). The assessment of eligibility for RTFCs will occur at the application level.

6.12 A bundle may contain applications from more than one reporting period within an obligation period. However, it may not contain applications from multiple obligation years.

How an application is assessed

6.13 The Administrator will not issue RTFCs where:

- there are outstanding issues concerning that application
- fossil or renewable fuel quantities for any of the months covered by the application have not been validated or the application is for a larger volume of renewable fuel than has been validated

[19] See the Administrator's sustainability compliance policy at Annex C: for further details.

- there are any significant account management issues such as the Administrator no longer being satisfied that the account holder is the owner of the fuel at the duty point due to changes in a corporate group's structure etc.

6.14 As set out in the Sustainability Compliance Policy (see Annex C:), the Administrator will undertake other work as proportionate and necessary to verify the supplier's declaration that all the renewable fuel covered by the application has passed the sustainability criteria.

6.15 The Administrator may require a supplier to provide further information or evidence in support of an application.

6.16 If the Administrator has cause to believe that any portion of the application does not meet the sustainability criteria or any of the other requirements before an RTFC can be issued are not met (see paragraph 6.2), that application will not be approved.

6.17 The Administrator will inform the supplier as to why an application has not been approved.

6.18 In the event of a verifier being notified of a change in the evidence supporting an application for RTFCs, the verifier should assess that change, taking into account the opinion of any relevant certification body (where reliance is being placed upon a voluntary scheme for all or part of the information submitted and/or the chain of custody, the relevant certification body is the last point in the chain of custody that was covered by a voluntary scheme). The verifier should also provide a statement as to the materiality of that change and how it bears on the assurance statement issued for the relevant bundle, stating, where relevant, that the opinion of any relevant certification body upon that change has been taken into account.

6.19 If the amendment of evidence supporting an application does not result in a new assurance statement, the verifier should provide a statement that the change is not material to the original assurance.

How RTFCs are issued

6.20 RTFCs are credited to the supplier's electronic account on ROS. All other transactions involving RTFCs occur on ROS as well.

6.21 One RTFC is issued per litre (or equivalent – see paragraph 1.28) of renewable transport fuel or renewable part of a partially renewable transport fuel that meets the requirements set out above, except where 6.22 applies.

6.22 Two RTFCs are issued per litre (or equivalent) of renewable or renewable part of partially renewable transport fuel where that fuel meets the requirements above and that fuel has been produced from certain feedstocks that are wastes or residues, dedicated energy crops, or produced using only renewable energy of non-biological origin (RFNBOs). See Chapter 4 and the list of feedstocks online for more information on which fuels are eligible for double reward.

6.23 For fuels that have a multiplier specified in paragraph 1.29, the number of RTFCs awarded per kilogram or litre of fuel is multiplied by the number specified. The resulting number of RTFCs awarded per kilogram or litre of fuel is outlined in Table 6.

Fuel type	Unit multiplier applied to	Multiplier for single counting fuel	Multiplier for double counting or development fuel
Biomethane	kilogram	1.9	3.8
Biopropane and biobutane	kilogram	1.75	3.5
Hydrogen	kilogram	4.58	9.16
RFNBO Ammonia used in maritime	kilogram	0.66	1.32
RFNBO Methanol used in maritime	litre	0.7	1.4
All other liquid renewable fuels	litre	1	2
All other gaseous renewable fuels	kilogram	1	2

Table 6 Multipliers for calculating the number of RTFCs per kilogram or litre of renewable fuel

6.24 Two 'development fuel' RTFCs will be issued to renewable fuels that meets the definition of a development fuel (see Chapter 4). For fuels which have a multiplier specified in paragraph 1.29, the number of RTFCs awarded is equal to those awarded to double counting renewable fuels of the same type (see Table 6).

Application of rounding when RTFCs are issued

6.25 As a consequence of how RTFCs are issued for fuels with multipliers (see paragraph 6.23 & Table 6), the Administrator applies rounding when issuing RTFCs. Rounding will be applied to each application rather than to each litre. In practice, this means an approved application for 100,001 kilograms of biomethane (from a single counting material) would be multiplied by the kilograms: litres factor of 1.9, which gives an entitlement to 190,001.9 RTFCs. As 0.9 of an RTFC cannot be issued, this would be rounded to 190,002 RTFCs.

RTFC categories

6.26 Three categories of RTFC are issued: 'relevant crop', 'development fuel' and 'general' RTFCs.

6.27 Renewable fuels made from feedstocks that fall under the definition of relevant crop and hence are counted towards the crop cap are awarded 'relevant crop' RTFCs. Relevant crop RTFCs cannot be counted towards the development fuel target - for more information see Chapter 3.

6.28 A 'development fuel' is a fuel of a specified fuel type, made from sustainable wastes or residues which the Administrator considers are eligible for double RTFCs (apart from segregated oils and fats such as used cooking oil and tallow), or a non-biological renewable fuel (RFNBO). Further information is included in Chapter 4.

6.29 RTFCs awarded to all other renewable fuels are labelled as 'general'. This category includes fuels from wastes that do not meet the development fuels eligibility criteria and fuels from dedicated energy crops.

6.30 These RTFC categories are summarised in Table 7.

Type of feedstock and / or fuel	Subject to crop cap?	Can be used for development fuel target?	RTFC category
Relevant crop	Yes	No	Relevant crop
Dedicated energy crop	No	No	General
Product which is not a relevant crop or energy crop	No	No	General
1x counting wastes and residues	No	No	General
2x counting wastes and residues, not development fuel type	No	No	General
2x counting wastes and residues, are a development fuel type	No	Yes	Development fuel
RFNBO, not development fuel type	No	No	General
RFNBO, of a development fuel type	No	Yes	Development fuel

Table 7 Summary of RTFC categories

Identification and 'carryover' of RTFCs

6.31 RTFCs are marked with the obligation period relating to the supply of fuel for which they were issued.

6.32 A supplier's obligation period RTFC account on ROS is divided into the three categories of RTFC and a supplier can choose which category of RTFCs they wish to redeem or transfer from their account. When transferred, an RTFC is credited to the appropriate category in the receiver's account.

6.33 The RTFO Order allows 25% of the main obligation and development fuel target to be met with RTFCs issued in the preceding period - commonly termed 'carryover'. ROS will not accept redemption transactions that attempt to meet more than 25% of the main obligation or development fuel target with RTFCs from the previous obligation period.

6.34 RTFCs carried over from previous obligation years will keep their 'relevant crop', 'development fuel' or 'general' label and will count towards the respective cap or target of the new obligation year. Chapter 3 explains further how 'relevant crop' and 'development fuel' RTFCs are be treated when carried over.

Transferring RTFCs from one account to another

6.35 The RTFO Order allows suppliers to transfer RTFCs from one account to another.

6.36 This is done via the ROS system where a supplier selects how many RTFCs they wish to transfer and the account to which they wish to transfer them.

6.37 A supplier may select which year's RTFCs and which RTFC category to transfer.

6.38 Suppliers may set up delayed transactions to occur in the future.

6.39 For an RTFC to be eligible for redeeming, it must be present in the account of the supplier that wishes to redeem it on the day of the redemption deadline.

6.40 Any commercial matters related to a transfer are matters for the two parties involved in the transfer.

6.41 The Administrator will correct any IT system errors that occur in a transaction. However, the Administrator can only reverse a transfer where only one party is disputing that transaction if ordered to do so by a court, as the Administrator does not have the powers to judge which party is correct in the event of a dispute.

6.42 The Administrator will apply a 'first in-first out' principle to tracing RTFCs from the original supplier to a transferee, unless the original supplier or any subsequent transferor notifies the Administrator of a different arrangement for the relevant RTFCs. An example of such a notification would be that a third-party trading entity would be able to state which supplier they had traded the certificates on to.

Revocation of RTFCs

Circumstances in which RTFCs may be revoked

6.43 The Administrator may revoke an RTFC where they are satisfied that:

- the declaration that accompanied the application for RTFCs was false
- RTFCs were issued as a result of fraudulent behaviour, statement or undertaking on the part of the supplier, any connected person or the verifier
- the information provided on fuel quantities or sustainability information was materially inaccurate or any evidence presented to support this information was insufficient to substantiate it
- the verifier's assurance report on the sustainability information was materially inaccurate

Which RTFCs will be revoked

6.44 Whilst the Order applies revocation to individual RTFCs, in practice, the Administrator will revoke all the necessary RTFCs in one action and actions in the subsequent

paragraphs apply to that group of RTFCs. Where the reasons for revocation relate to the verifier's assurance report on a bundle, it is likely that all RTFCs relating to that group will be revoked. Where the reasons for the revocation relate to the sustainability information within an application, the revocation will relate to that consignment. Where the reasons for revocation relate to the volume of fuel supplied and the fuel volume in question does not match the volume in one or more applications, the Administrator will decide on a case-by-case basis whether the revocation(s) occur within or at application level.

6.45 Where possible the Administrator will revoke RTFCs of the correct obligation period and RTFC category from the original supplier.

6.46 Where the supplier does not have sufficient RTFCs for the Administrator to revoke from the correct obligation period and category, RTFCs of that same category and obligation period will be revoked from a transferee.

6.47 The Administrator will apply a 'first in-first out' principle to tracing RTFCs from the original supplier to a transferee, unless the original supplier or any subsequent transferor notifies the Administrator of a different arrangement for the relevant RTFCs.

6.48 If, upon the notice of revocation being served the original supplier or a subsequent transferor wishes to submit evidence that the assignment of the RTFCs in question to a particular transfer should not be applied on a 'first in-first out' principle or any notification made to the supplier at the point of the transfer, this will be taken into account by the Administrator in determining which RTFCs to revoke.

6.49 For example, 15,000 RTFCs are issued to supplier A for two applications of 7,500l with the same RTFC category. Supplier A then transfers these RTFCs in the following order: 5,000 to supplier B, 5,000 to supplier C and 5,000 to supplier D. The Administrator then determines that RTFCs should not have been issued to one of the applications and revokes 7,500 RTFCs. As supplier A no longer has any RTFCs of the correct obligation period or category, they must be revoked from one of the suppliers to whom they have been transferred. If the transferor has not provided any evidence as to which RTFCs they purchased, the Administrator will apply the 'first in-first out' principle. This means that 5,000 RTFCs will be revoked from supplier B and 2,500 from supplier C.

6.50 When a revocation of RTFCs occurs, relevant C&S data will be removed from ROS.

6.51 Where the RTFCs related to a particular amount of renewable fuel are revoked, that amount will no longer be subtracted from the obligation.

Process for revoking RTFCs

6.52 The Administrator will mark the application data in question as 'revoked' and this data will become available to suppliers as an 'open' application.

6.53 The Administrator must inform a supplier of its intent to revoke an RTFC and inform the supplier as to the grounds for revoking that RTFC.

6.54 The Administrator may not serve notice of intent to revoke after 16 June immediately after the obligation period to which the RTFC in question belongs.

6.55 An RTFC will be marked on ROS as 'intended for revocation' during this process. Whilst RTFCs are marked 'intended for revocation', they cannot be traded, redeemed or surrendered by the current owner.

6.56 If that RTFC has been transferred out, then the Administrator must inform both the original supplier, and any subsequent owner of the RTFC, of both the intent to and the grounds for revocation.

Making representations against a revocation proposal or decision

6.57 Revocation of an RTFC occurs in two stages. First the Administrator issues 'notice of intent to revoke' which both the original owner and any subsequent owner(s) may make representations against. Should the Administrator decide to, a 'revocation notice' is then served, against which the original owner and any subsequent owner(s) may appeal.

6.58 Any representations against the 'notice of intent to revoke' or the 'revocation notice' must be made within 14 days of the notice being received.

6.59 The last date the Administrator may issue a 'notice of intent to revoke' is 16 June after the end of the obligation period. Any representations against this 'notice of intent' must be considered by 16 July after the end of the obligation period.

6.60 The last date the Administrator may issue a 'revocation notice' is 16 July after the end of the obligation period. Any appeal against this revocation must be considered by 15 August after the end of the obligation period.

6.61 The Administrator will inform the parties involved of the outcome of its consideration of either a representation against a 'notice of intent to revoke', or an appeal against a 'revocation notice'.

6.62 If the Administrator determines that the revocation should not occur at either stage, the relevant parties will be informed and the RTFCs will become available to the current owner for trading, redeeming or surrendering.

6.63 The Administrator may allow an oral hearing when considering a representation against a 'notice of intent to revoke' or an appeal against a 'revocation notice'.

6.64 If the Administrator fails to make a determination by 15 August, the RTFCs will be re-instated.

6.65 If the Administrator confirms that a revocation should occur, the RTFC will be marked on ROS as revoked and therefore be permanently unavailable for trading or redemption by the current owner. The grounds for this confirmation (which may be different to the grounds for the original intent to revoke) will be communicated in writing.

Applying for RTFCs for fuel that has had RTFCs revoked

6.66 Where RTFCs have been revoked for the fuel in question, suppliers may apply again for RTFCs. However, unless there is new information or evidence to support the application, the Administrator is unlikely to issue RTFCs.

Links from RTFC revocation to civil penalties

6.67 The gaining or attempt to gain an RTFC through the provision of inaccurate information, or the continued ownership of an RTFC where a supplier is aware that the information used to gain that RTFC is inaccurate, but has failed to inform the Administrator, is subject to a civil penalty as set out in Annex A:.

Obligation status of renewable fuel for which RTFCs have been revoked

6.68 Where RTFCs have been revoked, the renewable fuel in question will no longer be regarded as sustainable and it will therefore count towards a supplier's obligation.

7. RTFO Carbon and Sustainability Requirements

Chapter summary

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

7.1 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.

Who should report C&S information to the RTFO Administrator

7.2 Renewable Transport Fuel Certificates (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 (or alternative assessment point where this is specified in Chapter 4).

7.3 Any parties wishing to claim RTFCs are required to report all fuel quantities to the RTFO Administrator. Reporting of fuel quantities and obligations are covered separately in Chapter 5.

7.4 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. To do this, suppliers must submit verified C&S reports which demonstrate compliance with the RTFO sustainability criteria via an IT system called the RTFO Operating System (ROS). Account holders who purchase RTFCs do not have any C&S reporting requirements with respect to the purchased RTFCs.

7.5 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 paragraph 3.8 for more information.

RTFO C&S requirements

7.6 To be eligible for RTFCs, suppliers must be able to demonstrate that they meet the C&S requirements of the RTFO. These requirements are that the fuel meets the relevant RTFO sustainability criteria and that a complete chain of custody can be demonstrated in order to track C&S data back to its original source following the principles of mass balance.

7.7 Additional sustainability information must also be reported for crop-derived biofuels (see paragraph 7.15). This information is not explicitly required for RTFC applications but if it is not provided in full within verified RTFC applications suppliers must submit a separately verified annual report containing the missing information.

7.8 All C&S information reported to the Administrator must be independently verified

7.9 This subsection outlines the above-described requirements which are then described in more detail in the subsequent chapters of this document.

RTFO sustainability criteria

7.10 The RTFO Order Schedule sets out the sustainability criteria that suppliers must demonstrate compliance with in order to be eligible for RTFCs. There are four elements to the RTFO sustainability criteria:

- **GHG emissions saving threshold (Chapter 8):** Renewable fuels must meet an emissions saving threshold which depends on the fuel type and when the production installations were built. Biofuels produced in installations operating on or before 5 October 2015 must achieve at least a 55% GHG emissions saving. Biofuels produced in installations which started operating after 5 October 2015 and all RFNBOs must deliver at least a 65% GHG emissions saving.
- **Land criteria (Chapter 9):** Biofuels made from feedstocks subject to the land criteria cannot be made from raw material obtained from land with high biodiversity value at any point during or since January 2008 and 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.
- **Forest criteria (Chapter 9):** Biofuels made from forest biomass must come from land where there are appropriate monitoring and enforcement systems in place to ensure legal harvesting, forest regeneration and the maintenance of soil carbon.
- **Soil carbon criteria (Chapter 9):** Biofuels made from agricultural residues or wastes must come from land where there are monitoring or management plans in place to address the impacts on soil quality and soil carbon of the harvesting of the feedstock concerned.

7.11 The exact criteria which a given consignment of renewable fuel must meet depend on the feedstock from which it is made, as set out in Table 7. The requirements can be summarised as follows:

- by default, a fuel needs to meet the GHG emissions saving and the land criteria
- fuels made from residues and wastes from agriculture must also meet the soil carbon criteria
- fuels made from any kind of forest biomass (including wastes and residues) must meet the GHG emissions saving and the forest criteria, but not the land criteria
- RFNBOs and fuels made from wastes and residues not from agriculture, aquaculture, fisheries or forestry only need to meet the GHG emissions saving

Feedstock	GHG emissions saving threshold	Land criteria	Forest criteria	Soil carbon criteria
Forest biomass, including residues from forestry or wastes from forestry	✓	✗	✓	✗
Residues, including processing residues, which are not residues from agriculture, aquaculture, fisheries or forestry	✓	✗	✗	✗
Wastes, which are not wastes from agriculture, aquaculture, fisheries or forestry	✓	✗	✗	✗
Residues or wastes from agriculture	✓	✓	✗	✓
Renewable energy of non-biomass origin	✓	✗	✗	✗
Any feedstock not falling within entries listed above	✓	✓	✗	✗

Table 7 Relevant RTFO sustainability criteria that fuels produced from different kinds of feedstock must meet

Chain of custody and mass balance requirements

7.12 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 RTFO. 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 renewable fuel sold, the corresponding sustainable feedstock has been produced.

7.13 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 10.

Additional sustainability information

7.14 The RTFO Order requires that suppliers submit certain additional sustainability information in addition to demonstrating that the RTFO sustainability criteria are met and that this 'additional sustainability information' must be verified. The information has been included as part of the RTFC application process on ROS.

7.15 Additional sustainability information is only required in the case of agricultural crops (energy crops or relevant crops). Suppliers of fuels made from wastes, residues and RFNBOs do not need to provide this information.

7.16 The additional sustainability information required is outlined in Table 8, along with an explanation of what action suppliers need to take to meet the additional sustainability information reporting requirements.

7.17 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.

Additional sustainability information requirement	Acceptable responses for 'additional information' requirements
Whether the fuel has been certified or accepted as fulfilling the requirements of a scheme that has been recognised by the RTFO	Any voluntary scheme from the drop-down list or 'none - feedstock not certified.' If this is left blank it will be treated as 'no'.
Whether the GHG bonus of 29 gCO_2eq/MJ has been applied (for degraded land)	'Degraded land' in 'land use on 1 Jan 2008' or any other land use category from the list
Whether emission savings from soil carbon accumulation via improved agricultural management been used for the GHG calculation	'Yes' or 'No' in 'Soil carbon accumulation'

Table 8 Additional sustainability information reporting requirements

Accounting for indirect land-use change

7.18 Indirect land-use change (ILUC) is land-use change where the cause is at least one step removed from the effects. It is the knock-on effect on expansion of agricultural land use resulting from the cultivation of biofuel feedstocks.

7.19 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. 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.

7.20 To help tackle ILUC, the RTFO Order encourages the supply of fuel created from the most sustainable feedstocks via additional rewards for waste feedstocks and an additional development fuels target that takes into account both the fuel type and the feedstock. Crop-derived biofuels cannot be used to meet the development fuel target. In addition, the main obligation includes a crop cap which limits the maximum

contribution that crop-derived biofuels can deliver to supplier obligations (see Chapter 3).

7.21 In addition to the existing sustainability reporting requirements in this Guidance, the Administrator also gathers information on estimated ILUC emissions from land-based (crop) biofuels.

7.22 The ILUC values used by the Administrator are shown in Table 9 below and show 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. These values are **automatically applied on the ROS IT system** based on the feedstock information already reported by suppliers.

7.23 ILUC values are calculated for reporting purposes only and are not taken into account for the purposes of meeting the GHG emissions saving threshold.

Feedstock group	ILUC values
Cereals and other starch-rich crops	12
Sugars	13
Oil crops	55

Table 9 Estimated ILUC emissions from biofuel and bioliquid feedstocks (gCO_2e/MJ).

7.24 Estimated ILUC emissions are considered to be zero in the following situations:

- for feedstocks that are not listed in Table 9
- if there has been a (RTFO-compliant) direct land-use change (see Chapter 9)

7.25 Suppliers must contact the Administrator before making an application in relation to fuel derived from a relevant crop (see Chapter 4 for definitions) 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.

Reporting C&S data

7.26 C&S reports must contain the information required to demonstrate compliance with the RTFO sustainability requirements. For many renewable fuels, compliance with all these criteria can be demonstrated by reporting through a recognised voluntary scheme. For detailed guidance on how to demonstrate compliance with the sustainability criteria see Chapters 8 and 9. Evidence requirements for demonstrating compliance are set out in full in Chapter 11.

7.27 C&S reports are submitted through the ROS IT system.

Reporting renewable fuel that meets a voluntary scheme

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

7.29 Further information on using voluntary schemes to demonstrate compliance with the RTFO sustainability criteria can be found in Chapters 8 & 9.

7.30 A supplier must be able to provide proof that they have 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 10 for chain of custody and mass balance requirements and Chapter 11 for evidence requirements.

C&S reporting by application

7.31 C&S reports on renewable fuels must be per application. Individual applications must consist of an is any amount of product with an identical set of sustainability characteristics. Those characteristics are:

- fuel type
- renewable fuel feedstock
- renewable fuel production process (if applicable)
- country of origin
- voluntary scheme(s)
- land use on 1 January 2008
- carbon intensity

7.32 Suppliers may operate a site-based mass balance system to allocate sustainability data (by application) to physical consignments of renewable fuel. See Chapter 10 for further information and rules on operating a mass balance system.

7.33 A physical consignment may contain more than one application. Conversely, an application may be split between different physical consignments.

7.34 Each application must be associated with a particular month's volume of supply (or quarter for those suppliers who report fuel quantities quarterly) and must be unique to a particular duty type. The total volume of the consignments associated with a particular period cannot exceed the volume of renewable fuel supplied in that period.

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

Verification

7.36 Once data is complete for one or more application, and the other requirements set out in this 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. A verifier's statement is required for every application for an RTFC - RTFCs will not be issued where no such information has been provided.

7.37 Suppliers can '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.

7.38 Verification effort is likely to be reduced in the case that the renewable fuel meets a voluntary scheme, particularly where those schemes cover the full chain of custody and all of the sustainability data.

7.39 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[20]). It must be undertaken by a person who is independent of the supplier and who has the necessary expertise.

7.40 Chapter 12 gives further information on appointing a verifier. This includes 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 should undertake.

7.41 The Third-Party Assurance Guidance provides detailed information on the processes which verifiers will undertake. This guidance also provides a useful reference for suppliers preparing for verification.

Changing C&S data

7.42 Once C&S data has been assigned to renewable fuel at the duty point, the further substitution of the C&S data with a different C&S dataset through the use of mass balance is not permitted[21]. Note that this is distinct from correcting inaccurate data in relation to the same renewable fuel - see below.

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

7.44 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.

7.45 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.

7.46 After RTFCs have been issued, data cannot 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.

7.47 Data cannot be amended after the reporting deadline following the end of the obligation period for which the RTFCs are being applied for, unless the Administrator

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[20] The RTFO Administrator is not aware of any equivalent standards at the time of publication.

[21] This applies whether or not the verification of that C&S data or the application for certificates was successful.

expressly authorises it. However, suppliers are still required to inform the RTFO Administrator if they become aware of any inaccuracies in the data.

7.48 The deadline for RTFC applications to be received is 14 May following the end of the calendar obligation year. Please see Chapter 6 for full details.

Further guidance and resources

Tools for greenhouse gas calculations

7.49 Several tools and resources are supplied on the RTFO guidance webpages to assist suppliers wishing to calculate the GHG emission savings of their renewable fuels:

- **Carbon Calculator**[22]**:** The Carbon Calculator is a free software tool available online to help reporting parties determine the GHG emissions from consignments of renewable fuels 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 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.
- **RTFO standard data:** This spreadsheet provides standard values such as global warming potentials, lower heating values (LHVs), transport efficiencies and emission factors for commonly used inputs. These values should be used in suppliers' GHG calculations where they are available. It also lists carbon defaults which can be used when reporting carbon intensities of specific fuel chains.

7.50 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.

Information on voluntary schemes

7.51 A table is supplied online listing which voluntary schemes are accepted by the RTFO Administrator.

7.52 For each voluntary scheme, the table lists what sustainability requirements they have been recognised as providing evidence for. It also sets out the dates from which these schemes are recognised.

Information on fuels and feedstocks

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

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[22] 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".

Additional documents

7.54 Additional sources and documents relevant to this guidance, including relevant legal instruments, are available online.

Publication of information

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

7.56 Information on renewable fuel supply by each company is published annually. Reports are available on the DfT website. Individual applications for RTFCs, information on supplier fuel quantities and verifiers' opinions will not be published.

8. Demonstrating compliance with the greenhouse gas emissions saving criteria

Chapter summary

This chapter sets out the greenhouse gas (GHG) requirements of the RTFO 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, actual values or a mix of actual and default values.

Terminology

8.1 The following terminology will be used throughout this chapter:

- The **carbon intensity** of a renewable fuel refers to the life-cycle emissions of greenhouse gases (GHGs) from the fuel supply chain. It is expressed in units of carbon dioxide equivalents per megajoule of fuel (gCO_2e/MJ).
- **Carbon defaults** are carbon intensity values provided for a number of biofuel production pathways, 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 saving 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 and is currently set by the Administrator at 94 gCO_2e/MJ.
- The term **'installation'** includes any processing installation used in the production process. It should not be understood as including production facilities that might have been intentionally added to the production chain only to qualify for the exemption foreseen in this provision. The term **'old chain installation**' refers to any processing installation that was in operation on or before 5 October 2015[23].

[23] 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.

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.

Demonstrating compliance with the GHG emissions saving criteria

Required GHG emissions saving

8.2 The direct GHG emissions saving of a renewable fuel are established by comparing the renewable fuel's carbon intensity against the displaced fossil fuel's carbon intensity. This comparison must be done using carbon intensity values given on an energy basis i.e. gCO_2e/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.

8.3 When converting carbon intensities from gCO_2/kg or gCO_2/l to gCO_2/MJ, suppliers should use the lower heating values (LHVs) provided in the RTFO standard data. If no energy content value is available, suppliers should contact the Administrator.

8.4 The carbon intensity for all fossil fuels (e.g. petrol, diesel, etc.), referred to as the fossil fuel comparator, is 94 gCO_2e/MJ.

8.5 GHG emissions saving percentage from renewable fuels should be calculated as follows:

$$\text{GHG Saving (\%)} = \frac{(E_{FF} - E_{RF})}{E_{FF}} \times 100$$

Where:

- ERF = total emissions from the renewable fuel
- E_{FF} = total emissions from fossil fuel comparator for transport

8.6 To be eligible for RTFCs, renewable fuels must meet the GHG emissions saving threshold. The threshold that a fuel has to meet depends on the fuel type and when the production installations were built (Table 10). Biofuels produced in installations operating on or before 5 October 2015 must achieve at least a 55% saving (equivalent to a maximum allowable carbon intensity of 42.3 gCO_2e/MJ). Biofuels produced in installations that started operating after 5 October 2015 and all RFNBOs must deliver at least a 65% saving (equivalent to a maximum allowable carbon intensity of 32.9 gCO_2e/MJ).

8.7 In practice, suppliers are not required to calculate the GHG emissions saving of a fuel directly. Instead, compliance can be demonstrated by reporting a verified carbon intensity of less than or equal to the relevant maximum allowable carbon intensity (Paragraph 8.6, Table 10).

Fuel type	Installation start date	GHG emissions saving threshold	Maximum permitted carbon intensity
Biofuel	On or before 5 October 2015	55%	42.3
Biofuel	After 5 October 2015	65%	32.9
RFNBO	Any	65%	32.9

Table 10 GHG emissions saving thresholds and maximum permitted carbon intensity

Assessing the carbon intensity of renewable fuels

8.8 The carbon intensity of a consignment of renewable fuel can be assessed by one of the following options:

- selecting the appropriate default value
- collecting information about the way in which it was produced to calculate an actual carbon intensity
- combining actual data with default input data or disaggregated default values

8.9 Further guidance on how to assess the carbon intensity of **biofuels** through each of the three options listed above is provided in the subsequent sections of this chapter.

8.10 For RFNBOs, suppliers must calculate and report actual GHG emissions using a different methodology set out in separate RFNBO guidance issued by the Administrator. There are no default figures available for RFNBOs.

Voluntary schemes and verification

8.11 In order for a consignment of renewable fuel to be eligible for RTFCs, reported carbon intensity values must be verified along with the rest of the data contained in the C&S report.

8.12 Reporting GHG values using one or more recognised voluntary schemes helps to demonstrate compliance with the GHG emission saving criteria and is likely to substantially reduce the verification effort. However, regardless of voluntary scheme recognition a carbon intensity value must always be reported and this value must meet the thresholds set out in paragraph 8.5 and Table 10.

8.13 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 full verification.

8.14 Suppliers should be mindful of any differences between the RTFO methodology outlined here and those followed by voluntary schemes. For example, voluntary schemes may permit the averaging of carbon intensity values across multiple feedstocks co-digested in the same anaerobic digestor – this is not permitted under the RTFO where all carbon intensities must be calculated and reported on an individual feedstock basis. In such cases, it is still permissible to report using a

recognised voluntary scheme. However, where carbon intensities calculated on an individual feedstock basis are not provided through a voluntary scheme, carbon intensities will need to be calculated separately in line with the RTFO methodology (paragraph 8.46). These calculations should then be submitted and verified alongside the relevant voluntary scheme evidence (e.g. a proof of sustainability).

Using default values to demonstrate compliance

8.15 Default values are provided in Annex D: for many of the more commonly used biofuel production pathways. These values may be used when calculating the GHG emissions of biofuels and are intentionally set conservatively to account for deviation from normal processes.

8.16 Suppliers should report actual values if:

- they wish to demonstrate a higher GHG emissions saving
- the default does not meet the required GHG emissions saving
- there have been emissions due to land-use change
- where no default has been published for a particular production pathway

Guidance on reporting actual values is provided in the next subsection.

8.17 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.

8.18 Several of the default values require information on the process used to produce the biofuel to determine the appropriate default value. In most cases, this information relates to the specific process fuel used. These default values must not be reported unless the relevant process information is known and matches that of the default value.

8.19 For a consignment to be RTFO-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) - guidance on calculating land-use change emissions is provided later in this chapter
- where a default value requires process information, but the process is unknown

Calculating actual values for the carbon intensity of biofuels

General conditions

8.20 Suppliers of biofuels wishing to report actual values for carbon intensity should follow the calculation methodology outlined in the subsequent section. This methodology is

based on a well-to-wheels (or equivalent) approach that includes all significant sources of direct GHG emissions.

8.21 Where default values exist for a particular fuel chain (see Annex D:), it is permissible to use a mix of actual and disaggregated default values when calculating the carbon intensity of a given consignment of fuel. Disaggregated default values collectively make up the total default values and can be used individually to account for emissions from a whole portion of the emissions calculation set out in paragraph 8.46, such as transport or processing. Disaggregated default values are also provided in Annex D:.

8.22 The Administrator provides standard values in the RTFO standard data such as global warming potentials, LHVs, transport efficiencies and emission factors for commonly used inputs. These values should be used in suppliers' GHG calculations where they are available. Where they are not available, the figures used should primarily be based on official statistical data from government or other independent bodies, or peer-reviewed academic work. In all cases, the figures used should be the most recent available and of good quality.

8.23 A free software tool is provided by the RTFO Administrator called the Carbon Calculator[24] which can be used to calculate carbon intensity values using actual data for fuel chains.

8.24 When presenting actual value calculations reporters are recommended to separate out the constituent elements of the GHG calculation (e.g. e_{ec}, e_{td}, e_{l}, e_{sca}, e_{ccr}). See the Methodology for calculating the carbon intensity of biofuels for more details.

Structure of a fuel chain

8.25 If planning to report actual values, it is important that suppliers understand the structure and boundaries of their fuel chain. Wherever practicable, it is strongly recommended to select from the common modules shown in Figure 7, which are grouped to line up with the key stages in the calculation methodology set out in paragraph 8.46. Further description of each of these modules is provided in Table 11.

8.26 A fuel chain can be constructed by arranging common modules into a series of sequential stages, an example of which is shown in Figure 8.

8.27 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.

[24] 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".

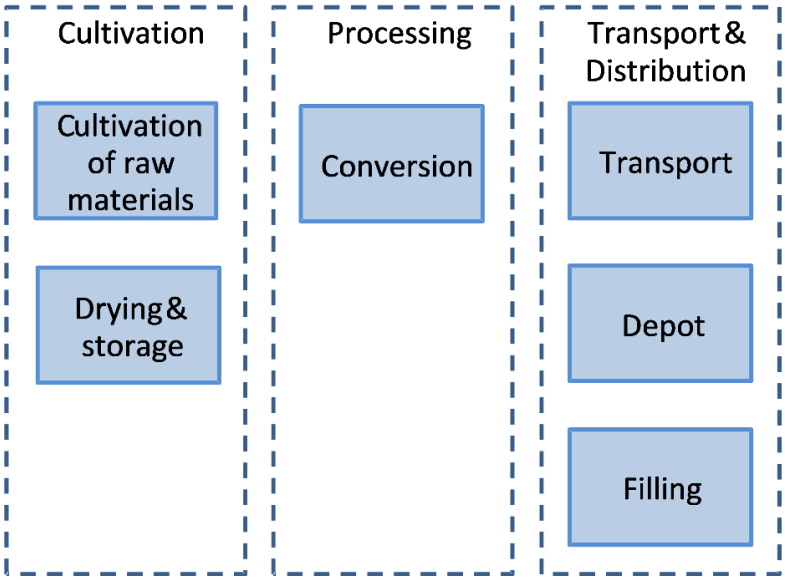

Figure 7 Modules used to define a biofuel chain

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

Table 11 Description of the modules constituting a typical biofuel fuel chain

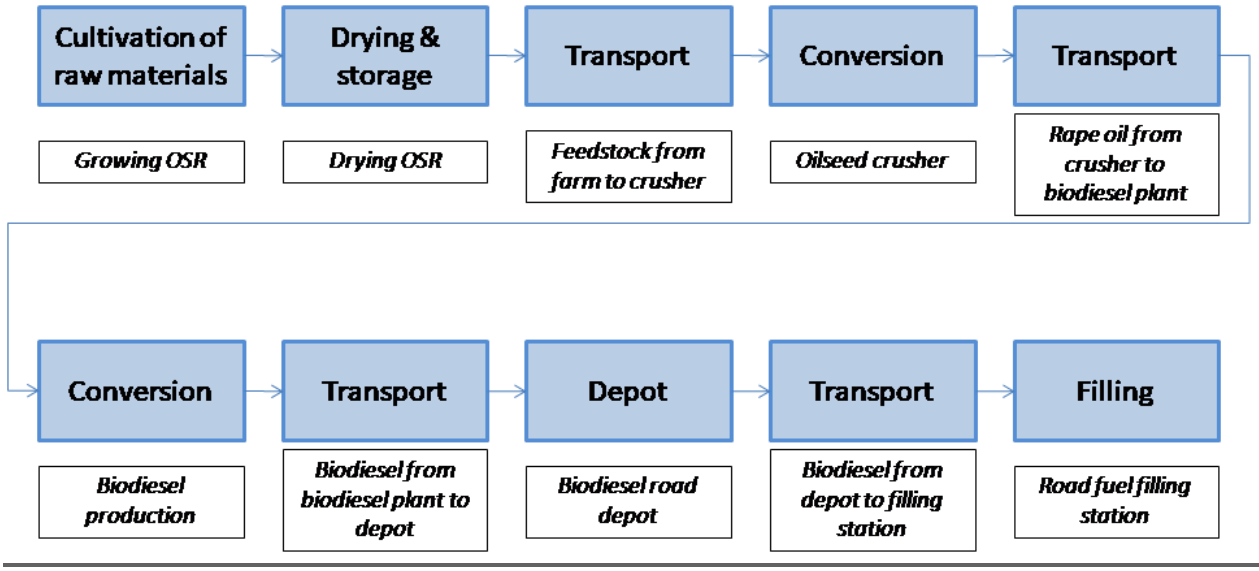

Figure 8 Example of fuel chain defined using common modules (OSR = oilseed rape)

Calculating actual values for partially renewable fuels

8.28 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 should take into account only the renewable feedstock. The emissions from the non-renewable part of the partially renewable biofuels do not need to be taken into consideration for the purposes of the RTFO. Note that distinct conditions apply for RFNBOs (see the RTFO RFNBO guidance).

8.29 For ETBE, TAEE and MTBE, 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, 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.

8.30 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.

Calculating actual values for fuels made from wastes and residues

8.31 Wastes and residues are considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials.

8.32 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' 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.

8.33 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.

What data to collect

8.34 Only a small number of data points have a significant influence on the final carbon intensity of a biofuel. Table 12 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.

8.35 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 from the origin of the biofuel to the filling station.[25]

Step in the supply chain	Focus for data collection/ GHG reduction
Crop production	Agrochemical application rate (e.g. nitrogen fertiliser) Crop yield and moisture content Fuel consumption for cultivation
Drying and storage	Fuel type (e.g. diesel) or electricity consumption for drying
Feedstock and liquid fuel transport	Transport distances
Conversion - e.g. biofuel conversion or oilseed crushing	Yield[26] Fuel type (e.g. natural gas, fuel oil, coal) and demand Electricity demand Chemical inputs Co-product yield and energy content Electricity demand Chemical inputs Co-product yield and energy content

Table 12 Aspects of the biofuel chain which most affect the carbon intensity

8.36 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 (see paragraph 8.21).

8.37 It is not necessary to have actual data for all sources of emissions: for feedstocks that have defaults provided by the Administrator it is possible to use a combination of actual data and default data in the GHG calculation.

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

Validity of actual data over time

8.39 The actual data which can be used 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.

[25] 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 life-cycle carbon emissions of the biofuel.

[26] i.e. tonnes of the product (e.g. biodiesel) per tonne of input (e.g. rapeseed oil).

Actual data for crop production

8.40 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
- 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)

8.41 It is also permitted to use regional cultivation data in the place of actual crop production data for the calculation of fuel chain GHG emissions. The numbers should primarily be based on official statistical data from government bodies when available and of good quality.[27]

8.42 If not available, statistical data published by independent bodies may be used. As a third option, the numbers may be based on peer-reviewed academic work, with the precondition that data used lies within the commonly accepted data range when available.

8.43 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.

8.44 In the absence of relevant regional average values, it is permitted to calculate averages based on local farming practices based for instance on data of a group of farms, as an alternative to using actual values, although this shall be at the discretion of the Administrator.

Methodology for calculating the carbon intensity of biofuels

8.45 The methodology for calculating GHG emissions outlined in this section applies to all renewable transport fuels that are derived from biomass regardless of state (i.e. both gaseous and liquid biofuels).[28]

Overall methodology

8.46 GHG emissions from the production and use of biofuels shall be calculated as follows:

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

[27] Regional cultivation data for the UK is available here.

[28] Note that this is different from the methodology outlined in Directive (EU) 2018/2001, whereby gaseous renewable fuels derived from biomass are defined separately from liquid biofuels and have a distinct methodology. Under the RTFO, the GHG emissions from gaseous and liquid biofuels should be calculated using the same methodology. As of January 2024 no manure credit may be applied for gaseous biofuels derived from manure.

Where:

- E = total emissions from the production of the fuel before energy conversion
- e_{ec} = emissions from the extraction or cultivation of raw materials
- e_l = annualised emissions from carbon stock changes caused by land-use change
- e_p = emissions from processing
- e_{td} = emissions from transport and distribution
- e_u = emissions from the fuel in use
- e_{sca} = emission savings from soil carbon accumulation via improved agricultural management
- e_{ccs} = emission savings from carbon capture and storage
- e_{ccr} = emission savings from carbon capture and replacement

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

8.48 Where the GHG emissions from the extraction or cultivation of raw materials, e_{ec}, are expressed in unit gCO_2e/dry-tonne of feedstock, the conversion to gCO_2e/MJ shall be calculated as follows[29]:

$$e_{ec}\text{fuel } [gCO_2eq/MJ \text{ fuel}] = \frac{e_{ec}\text{feedstock } [gCO_2eq/t_{dry}]}{LHV_{feedstock}\ [MJ/t_{dry}]} \times \text{Feedstock to fuel ratio} \times \text{Fuel allocation factor}$$

Emissions per dry-tonne feedstock shall be calculated as follows:

$$e_{ec}\text{feedstock } [gCO_2eq/t_{dry}] = \frac{e_{ec}\text{feedstock } [gCO_2/t_{moist}]}{(1 - \%\text{ water content})}$$

The fuel allocation factor shall be calculated as follows:

$$\text{Fuel allocation factor} = \frac{\text{Energy in fuel [MJ]}}{\text{Energy in fuel [MJ]} + \text{Energy in co-products [MJ]}}$$

The fuel allocation factor shall be calculated on a LHV (wet) basis where energy contents are calculated using the following equation:

$$LHV_{wet} = LHV_{dry} \times (1 - \%\text{ water content}) - 2.441 \times \%\text{ water content}$$

The feedstock to fuel ratio shall be calculated as follows:

Feedstock to fuel ratio = [Ratio of MJ feedstock required to make 1 MJ fuel]

The feedstock to fuel ratio should be calculated on a LHV (dry) basis where fuel and feedstock energy are calculated using the following equation:

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[29] The formula for calculating greenhouse gas emissions from the extraction or cultivation of raw materials e_{ec} describes cases where feedstock is converted into biofuels in one step. For more complex supply chains, adjustments are needed for calculating greenhouse gas emissions from the extraction or cultivation of raw materials e_{ec} for intermediate products.

$LHV_{fuel/feedstock} = LHV_{dry} \times (1 - \%\ water\ content)$

8.49 The greenhouse gases taken into account for the purposes of the equation in 8.45 shall be CO_2, N_2O and CH_4. For the purpose of calculating CO_2 equivalence, those gases shall be valued as follows:

- CO_2: 1
- N_2O: 298
- CH_4: 25

Guidance on calculating individual components

8.50 Emissions from the extraction or cultivation of raw materials, e_{ec}, shall include emissions:

- from the extraction or cultivation process itself
- from the collection, drying and storage of raw materials
- from waste and leakages
- from the production of chemicals or products used in extraction or cultivation

The capture of CO_2 in the cultivation of raw materials shall be excluded. Several options are available for calculating e_{ec} as outlined in paragraphs 8.40 to 8.44.

8.51 Wastes and residues are attributed with zero GHG emissions up to the process of collection of those materials. The process of collection may involve transportation of the material and any emissions of this transport step should therefore be included in e_{ec} (see paragraphs 8.31 to 8.33).

8.52 For the purposes of the calculation referred to in paragraph 8.45, GHG emission savings from improved agriculture management, e_{sca}, such as shifting to reduced or zero-tillage, improved crop/rotation, the use of cover crops, including crop residue management and the use of organic soil improver (e.g. compost, manure fermentation digestate), shall be taken into account only if solid and verifiable evidence is provided that the soil carbon has increased or that it is reasonable to expect to have increased over the period in which the raw materials concerned were cultivated while taking into account the emissions where such practices lead to increased fertiliser and herbicide use[30].

[30] Measurements of soil carbon can constitute such evidence, e.g. by a first measurement in advance of the cultivation and subsequent ones at regular intervals several years apart. In such a case, before the second measurement is available, an increase in soil carbon would be estimated on the basis of representative experiments or soil models. From the second measurement onwards, the measurements would constitute the basis for determining the existence of an increase in soil carbon and its magnitude.

8.53 Annualised emissions from carbon stock changes caused by land-use change[31], e_l, shall be calculated by dividing total emissions equally over 20 years. These emissions should be calculated as follows[32]:

$e_l = (CS_R - CS_A) \times 3.664 \times (1/20) \times (1/P) - e_B$

Where:

- e_l = the annualised GHG emissions from carbon stock change due to land-use change (in gCO_2e/MJ). 'Cropland'[33] and 'perennial cropland'[34] shall be regarded as one land use
- CS_R = 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 = 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 = the productivity of the crop (in MJ/ha/y)
- e_B = a bonus of 29 gCO_2e/MJ if the biofuel feedstock is obtained from restored degraded land (see paragraph 8.54)

Further guidance on determining carbon stocks (CS_R and CS_A) is provided later in this chapter (see paragraph 8.64).

8.54 The bonus of 29 g CO_2eq/MJ shall be attributed if evidence is provided that the land satisfies both of the following criteria:

- it was not in use for agriculture or any other activity in January 2008
- it is severely degraded land[35], including such land that was formerly in agricultural use

The bonus of 29 g CO_2eq/MJ shall apply for a period of up to 20 years from the date of conversion of the land to agricultural use, provided that a steady increase in carbon stocks as well as a sizable reduction in erosion phenomena are ensured.

8.55 Emissions from processing, e_p, shall include emissions:

- from the processing itself
- from waste and leakages

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

[32] The quotient obtained by dividing the molecular weight of CO_2 (44,010 g/mol) by the molecular weight of carbon (12,011 g/mol) is equal to 3,664.

[33] Cropland as defined by IPCC.

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

[35] 'Severely degraded land' means land that, for a significant period of time, has either been significantly salinated or presented significantly low organic matter content and has been severely eroded.

- from the production of chemicals or products used in processing, including the CO_2 emissions corresponding to the carbon contents of fossil inputs, whether or not actually combusted in the process.

In accounting for the consumption of electricity imported from an electricity grid rather than being generated on-site within the fuel production plant, the GHG emissions intensity of the production and distribution of that electricity shall be assumed to be equal to the average emission intensity of the production and distribution of electricity in a defined region.[36] By way of derogation from this rule, the electricity can be attributed a GHG emissions intensity of zero if the electricity can be demonstrated to be wholly additional renewable electricity as per Chapter 2 of the RTFO Guidance for RFNBOs. Guarantees of Origin are not considered acceptable evidence for demonstrating the use of additional renewable electricity.

In accounting for the consumption of methane or natural gas not produced within the fuel production plant, the gas consumed should be assumed to be entirely fossil gas (and appropriate GHG emissions factors applied). However, if it can be demonstrated that an equivalent quantity of renewable gas has been produced and mass balanced to the point of consumption, the GHG emissions intensity of the gas consumed can be taken to be that of the renewable gas. However, the GHG emissions intensity cannot be taken to be less than zero and the requirements of the RTFO Guidance for Biomethane must be met.

Emissions from processing shall include emissions from drying of interim products and materials where relevant.

8.56 Emissions from transport and distribution, e_{td}, shall include emissions from the transport of raw and semi-finished materials and from the storage and distribution of finished materials. Emissions from transport and distribution to be taken into account under paragraph 8.50 shall not be covered by this paragraph.

8.57 Emissions of the fuel in use, e_u, shall be taken to be zero for biofuels.

8.58 Emission savings from carbon capture and storage, e_{ccs}, that have not already been accounted for in e_p, shall be limited to emissions avoided through the capture and permanent storage of otherwise emitted carbon directly related to the extraction, transport, processing and distribution of the biofuel.[37] Storage must be demonstrably permanent and stable. Examples may include geological sequestration of CO_2, or the permanent sequestration of solid carbon through inert underground storage or integration into concrete or cement for use construction.

8.59 Emission savings from CO_2 capture and replacement, e_{ccr}, shall be related directly to the production of the biofuel they are attributed to, and shall be limited to emissions avoided through the capture of CO_2 of which the carbon originates from biomass and

[36] The figures used should take into account direct (Scope 2) emissions associated with electricity generation and indirect (Scope 3) emissions associated with the extraction, refining and transportation of primary fuels as well as electricity transmission and distribution.

[37] Where carbon is sequestered in a form other than CO_2, an equivalent quantity of CO_2 sequestered should be calculated based on the amount of elemental carbon sequestered. For example, if 1 kg of solid, elemental carbon is captured and sequestered, this would be equivalent to 3.66 kgs of sequestered CO_2.

which is used to replace fossil-derived CO_2 in the production of commercial products and services. In demonstrating this, it would suffice to verify that the CO_2 was sold to an economic operator that can reasonably be expected to make direct use of the CO_2 and has declared in writing that the purchased CO_2 will replace the use of fossil-derived CO_2 and that this will lead to emission savings.

8.60 For the purposes of both e_{ccs} and e_{cru}, any and all emissions related to the capturing and storage/replacement must be taken into account in the calculation.

Allocation of GHG emissions

8.61 Where a biofuel production process produces, in combination, the fuel for which emissions are being calculated and one or more other products ('co-products'), upstream and relevant process step GHG emissions shall be divided between the fuel or its intermediate product and the co-products in proportion to their energy content using the following equation:

$$\text{Fuel allocation factor} = \frac{\text{Energy in fuel [MJ]}}{\text{Energy in fuel [MJ]} + \text{Energy in co-products [MJ]}}$$

In the case of co-products other than electricity and heat, the energy content of products and co-products should be determined based on LHV (wet) of the feedstock, which can be calculated as follows:

$$LHV_{wet} = LHV_{dry} \times (1 - \%\ \text{water content}) - 2.441 \times \%\ \text{water content}$$

The GHG intensity of excess useful heat or excess electricity is the same as the GHG intensity of heat or electricity delivered to the biofuel production process and is determined from calculating the GHG intensity of all inputs and emissions, including the feedstock and CH_4 and N_2O emissions, to and from the cogeneration unit, boiler or other apparatus delivering heat or electricity to the biofuel production process. In the case of cogeneration of electricity and heat, the calculation is performed following paragraph 8.63.

8.62 For the purposes of the calculation referred to in paragraph 8.61, the emissions to be divided shall be $e_{ec} + e_l + e_{sca}$ + those fractions of e_p, e_{td}, e_{ccs}, and e_{ccr} that take place up to and including the process step at which a co-product is produced. If any allocation to co-products has taken place at an earlier process step in the life-cycle, the fraction of those emissions assigned in the last such process step to the intermediate fuel product shall be used for those purposes instead of the total of those emissions.

All co-products shall be taken into account for the purposes of that calculation. No emissions shall be allocated to wastes and residues. Co-products that have a negative energy content (LHV_{wet}) shall be considered to have an energy content of zero for the purposes of the emissions allocation calculation. Wastes and residues shall be considered to have zero life-cycle greenhouse gas emissions up to the process of collection of those materials irrespectively of whether they are processed to interim products before being transformed into the final product.

In the case of fuels produced in refineries, other than the combination of processing plants with boilers or cogeneration units providing heat and/or electricity to the processing plant, the unit of analysis for the purposes of the calculation referred to in paragraph 8.61 shall be the refinery.

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

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

Where:

- T_h = Temperature, measured in absolute temperature (kelvin), of the useful heat at the point of delivery
- T_0 = Temperature of surroundings, set at 273.15 kelvin (equal to 0 °C)

If the excess heat is exported for heating of buildings, at a temperature below 150 °C (423.15 kelvin), C_h can alternatively be defined as follows:

C_h = Carnot efficiency in heat at 150 °C (423.15 kelvin), which is: 0.3546

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

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

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

Calculation of carbon stock for land-use change emissions

8.64 The equation provided in paragraph 8.53 should be used for reporting land-use change. 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 Paragraph 8.65.

8.65 Carbon stock can be calculated using the following equation:

$CS_i = SOC + C_{VEG}$

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)

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

- previous land use
- climate and in some cases ecological zone
- soil type
- soil management (for both previous and new land use)
- soil input (for both previous and new land use)

8.67 Definitions of the different land use categories for determining previous land use are provided in Table 13. Climate, ecological zone and soil type can be taken from maps and data provided by the Joint Research Centre (JRC) and the Food and Agriculture Organisation of the United Nations (FAO) - 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.

8.68 In most cases, it is possible to use the information above to find the values for the different parameters in the look-up tables in the RTFO standard data. 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). 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

8.69 Parties may use several methods to determine soil organic carbon, including measurements[38]. When measurements are not used, the method used shall take into account climate, soil type, land cover, land management and inputs.

8.70 As a default method, the following equation can also be used:

$SOC = SOC_{ST} \times F_{LU} \times F_{MG} \times F_I$

[38] 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).

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 principal 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)

8.71 SOC_{ST} can be looked up in the RTFO standard data available online depending on climate region and soil type. The climate region can be determined from the climate region data layers produced by the JRC and available online. The soil type can be determined by following the flow diagram in Figure 9 or following the soil type data layers produced by the JRC and available online.

8.72 F_{LU}, F_{MG} and F_I can be looked up in the RTFO standard data available online depending on climate region, land use, land management and input.

Soil organic carbon - organic soils (histosols)

8.73 No default method is available for determining the SOC value of organic soils. However, the method used by parties should 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.

8.74 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.

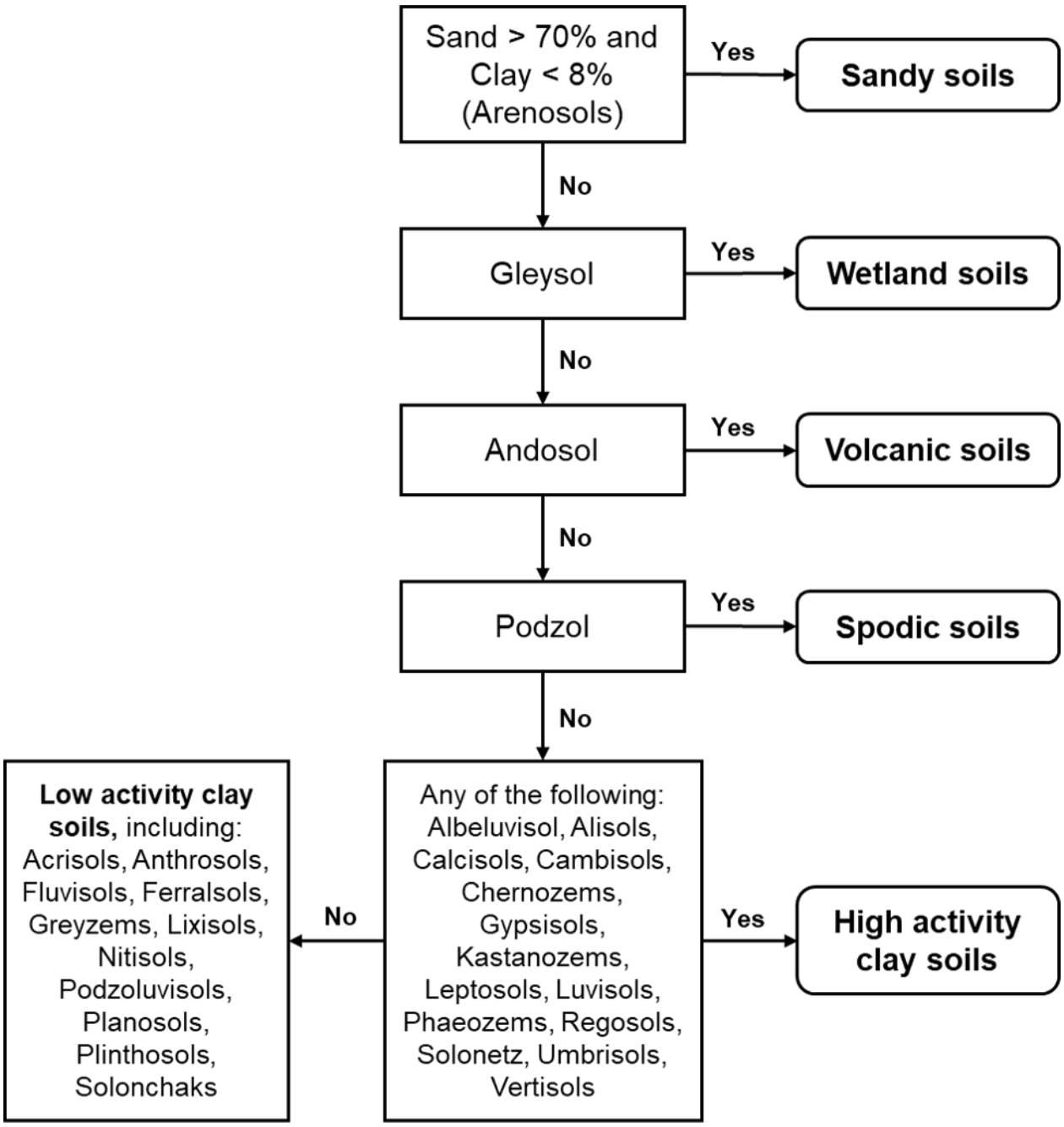

Figure 9 Flow diagram for classifying soil type

Increase in soil carbon stock through improved agricultural management

8.75 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 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.

8.76 Where there has been an increase in carbon stock through improved agricultural management, this should be reported in the appropriate field in ROS (see Table 8).

Above and below-ground vegetation carbon stock

8.77 For some vegetation types, C_{VEG} can be directly read from RTFO standard values available online. Relevant ecological zones can be determined from maps produced by the FAO.

8.78 If a look-up value is not available, vegetation carbon stock shall take into account both above and below-ground carbon stock in living stock (C_{BM} in gC/ha) and above and below-ground carbon stock in dead organic matter (C_{DOM} in gC/ha). For C_{DOM} the value of 0 may be used, except forest land (excluding forest plantations) with more than 30% canopy cover. These can be calculated based on the equations provided in paragraphs 8.79 & 8.80.

8.79 Above and below-ground carbon stock in living stock can be calculated using one of the following equations:

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

Or

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

Where:

- B_{AGB} is the weight of above-ground living biomass (in kg dry matter/ha) which shall be taken to be the average weight of the above-ground living biomass during the production cycle for cropland, perennial crops and forest plantations
- B_{BGB} is the weight of below-ground living biomass (in kg dry matter/ha) which shall be taken to be the average weight of the below-ground living biomass during the production cycle for cropland, perennial crops and forest plantations
- CF_B is the carbon fraction of dry matter in living biomass (in kgC/kg dry matter) which can be taken to be 0.47
- R is the ratio of below-ground carbon stock in living biomass to above-ground carbon stock in living biomass which can be read in the RTFO standard values available online

8.80 Above and below-ground carbon stock in dead organic matter shall be calculated as follows:

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

Where:

- DOM_{DW}.is the weight of the deadwood pool (in kg dry matter/ha)
- CF_{DW} is the carbon fraction of dry matter in the deadwood pool (in kgC/kg dry matter) which can be taken to be 0.5
- DOM_{LI} is the weight of litter (in kg dry matter/ha)
- CF_{LI} is the carbon fraction of dry matter in the litter (in kgC/kg dry matter) which can be taken to be 0.4

9. Demonstrating compliance with the land, forest and soil carbon criteria

Chapter summary

This chapter sets out the land, forest and soil carbon criteria of the RTFO and how suppliers can demonstrate compliance. This chapter is not applicable to RFNBOs or biofuels derived from wastes and residues which are not from agriculture, aquaculture, fisheries or forestry. For certain feedstocks, the land criteria are automatically satisfied including those categories of tallow that do not double count.

Introduction

9.1 In addition to meeting the GHG emissions saving threshold (Chapter 8), fuels made from certain feedstocks also must meet additional criteria, namely the land, forest and/or soil carbon criteria (Table 7).

9.2 Unless exempt, all fuels must meet the land criteria. Fuels made from residues and wastes from agriculture also must meet the soil carbon criteria.

9.3 RFNBOs as well as wastes and residues which are not from agriculture, aquaculture, fisheries[39] or forestry are exempt from the land criteria. Certain kinds of products not derived from the land are also exempt, as set out in the list of feedstocks online.

9.4 Fuels made from any kind of forest biomass (including wastes and residues) must meet the forest criteria rather than the land criteria.

9.5 It is strongly recommended that fuel suppliers meet the land, forest and soil carbon criteria by reporting through a voluntary scheme that has been recognised as demonstrating compliance with the relevant criteria as this means that no further

[39] In many cases materials from aquaculture and fisheries will automatically meet the land 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.

evidence is required. See the section on Demonstrating compliance through a voluntary scheme for more information.

The RTFO land criteria

9.6 The land criteria ensure that biofuel feedstocks are sourced in a way that preserves biodiversity and carbon stocks. To achieve this, it is prohibited to source biofuels from land that has or previously had a certain status (high biodiversity or carbon stock). In some cases, it is permitted to source material from land of a certain type if specific criteria are met.

9.7 The land criteria are made up of two sub-criteria, one which covers biodiversity and the other carbon stocks and peatlands.

Biodiversity criteria

9.8 To satisfy the biodiversity criteria, biofuels may not be made from raw material obtained from land with high biodiversity value in or after January 2008. The prohibited land categories are:

a) Primary forest or other wooded land of native species where there is no clearly visible indication of human activity and ecological processes are not significantly disturbed.

b) Highly biodiverse forest or other wooded land which is species-rich and not degraded except in cases where the land is designated for nature protection purposes and the production of relevant feedstock is a necessary management action that did not interfere with the purposes for which the land concerned was designated for nature protection purposes.

c) Land designated for nature protection purposes, including those designated for the protection of rare, including for the protection of rare, threatened or endangered ecosystems or species, unless production of the relevant feedstock can be shown not to have interfered with those nature protection purposes.

d) Natural highly biodiverse grassland[40] spanning more than one hectare.

e) Non-natural highly biodiverse grassland spanning more than one hectare, unless harvesting of the raw material is necessary to preserve its status as highly biodiverse grassland.

9.9 For the exemptions permitted in paragraph 9.8 for land categories b, c and e listed, evidence must be provided that satisfies the Administrator that the exemption is valid.

[40] Natural grassland is grassland that would remain as grassland and that maintains its natural species composition and ecological characteristics and processes in the absence of human intervention.

Carbon stocks and peatlands criteria

9.10 Biofuels must not be made from raw material if the sourcing of such biomass would cause adverse effects on land carbon stocks or to peatlands. To satisfy the carbon stocks and peatlands criteria each of the criteria outlined in paragraph 9.11, 9.12 or 9.13.

9.11 Biofuels may not be made from raw material obtained from land which had the following land status at any time in January 2008 and no longer has that status:

a) Wetlands, defined as land that is covered with or saturated by water permanently or for a significant part of the year.

b) Continuously forested areas 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.

9.12 Where raw material is sourced from land which at any time in January 2008 was a forested area 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, and the land no longer has that status, suppliers must be able to demonstrate that any biofuel made from that raw material meets the GHG emission saving criteria. Special care must be taken to ensure that any GHG emissions due to land-use change are taken into account following the equation in paragraph 8.53.

9.13 Biofuels may not be made from raw material obtained from land which was peatland at any time in January 2008, unless it can be demonstrated that the cultivation and harvesting of that raw material did not involve drainage of previously undrained soil.

The RTFO soil carbon criteria

9.14 The soil carbon criteria apply specifically to fuels made from wastes and residues derived from agriculture and is in addition to the land criteria.

9.15 To meet the soil carbon criteria, it must be demonstrated that monitoring or management plans are in place to address the impacts on soil quality and soil carbon of the harvesting of the relevant feedstock concerned.

9.16 To comply with the soil carbon criteria, it should be demonstrated that appropriate monitoring or management practices are either:

- required by law in the country of origin of the feedstock, and that their implementation is monitored and enforced
- in place at the farms from which the material was sourced

The RTFO forest criteria

9.17 The forest criteria apply to fuels derived from forest biomass including wastes and residues. Such fuels do not have to meet the land criteria.

9.18 Where a fuel is derived from such feedstocks, it must be demonstrated that the feedstocks meet the following criteria:

- the material has not been harvested from wetlands, peatlands or protected land areas unless the land is designated for nature protection purposes and the production of the relevant feedstock did not interfere with the purposes for which the land concerned was designated for nature protection purposes
- the material has been legally harvested
- the material has been harvested in such a way that negative impacts on soil quality and forest biodiversity are minimised and which maintains or improves the long-term production capacity of the forest from which it was harvested
- that areas that have been harvested are subject to forest regeneration[41]
- that changes in carbon stock associated with forest biomass harvest are accounted for in submissions related to the country's commitment to reduce or limit greenhouse gas emissions through the 'Paris Agreement', or the material has been harvested in such a way that carbon stocks and sinks levels in the forest are maintained or increased over the long term

9.19 To comply with the forest criteria, it should be demonstrated that appropriate monitoring or management practices which ensure the criteria described in paragraph 9.18 are satisfied are either:

- required by law in the country of origin of the feedstock, and that their implementation is monitored and enforced
- in place at forest sourcing area[42] from which the material is sourced

Demonstrating compliance through a voluntary scheme

9.20 A reporting party can provide evidence of compliance with one or all of the RTFO criteria by using one or more voluntary schemes. The scope and version of the scheme being reported should be recognised by the RTFO Administrator as providing evidence of compliance. Verifiers may consider evidence of compliance provided through other voluntary schemes, but these will not be available for reporting on ROS.

9.21 Voluntary schemes are recognised for a specific scope. For example, they might be recognised as providing evidence for one or more of the land criteria, forest criteria, soil carbon criteria, the GHG emissions saving criteria (including the possibility to calculate actual values), and/or the mass balance chain of custody. Where a voluntary scheme does not provide evidence for all of the land, forest and/or soil carbon criteria, then suppliers will need to demonstrate compliance with those criteria through another voluntary scheme or by following one of the compliance routes outlined in 9.26.

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[41] "Forest regeneration" means the re-establishment of a forest stand by natural or artificial means following the removal of the previous stand by felling or as a result of natural causes, including fire or storm.

[42] "Sourcing area" means the geographically defined area from which the forest biomass is sourced from which reliable and independent information is available and where conditions are sufficiently homogeneous to evaluate the risk of the sustainability and legality characteristics of the forest biomass.

9.22 The chain of custody rules of a voluntary scheme must be complied with for a supplier to claim that their renewable fuel 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. In such cases the final party reporting to the Administrator does not need to be certified by a voluntary scheme.

9.23 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 by 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.

9.24 When demonstrating compliance through a voluntary scheme, it is permitted to report a land use of 'Voluntary scheme - met land criteria' on ROS if the land use information was not passed down the chain of custody. However, where the land use is known it should always be reported. See Table 13 for a summary of land use categories.

Alternative options for demonstrating compliance with the land criteria

9.25 Reporting a 'voluntary scheme' that has been recognised as demonstrating compliance for the land criteria is the recommended option.

9.26 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:

- report one of the RTFO-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 RTFO land criteria)
- conduct their own field audits against the RTFO Sustainable Land Use Standard criteria. It is also possible for suppliers to conduct their own RTFO Biodiversity Audits to demonstrate compliance with the biodiversity criteria

Reporting an RTFO-compliant land use

9.27 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. Table 13 outlines which land use categories meet the RTFO land use criteria and under which conditions.

9.28 Some land use categories are not permitted to be used for biofuel feedstock production under the RTFO 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).

9.29 For the land use categories in Table 13 of “Forest greater than 30% canopy cover - no change in status”, “Forest 10 to 30% canopy cover", "wetland - no change in status", and "undrained peatland" these land uses should not be reported if that land was also in a designated protected area, except if evidence is provided that the production of that raw material did not interfere with those nature protection purposes.

9.30 The land use category of “Grassland (and other wooded land not classified as forest)” can only be reported if it can be demonstrated that the land has not been highly biodiverse grassland. “Highly biodiverse grassland - no change in status” should only be reported if it can be demonstrated that harvesting of the raw material is necessary to preserve the grassland status. In both cases, reporting using a recognised voluntary scheme or conducting a successful audit against the RTFO Biodiverse Grassland Standard (paragraph 9.41) are acceptable routes to demonstrating compliance with the biodiversity conditions.

9.31 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.[43]

9.32 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.

9.33 Cropland specifically refers to land that is under the control of the farm or plantation. It is feasible that the land under the 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.

9.34 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.

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[43] For example, if a plantation is located on land that was undrained peatland on 1 January 2008, this should always be reported as undrained peatland, irrespective of whether it had forest, grassland or cropland on it.

9.35 Suppliers will need to be able to demonstrate evidence of the land use they are claiming. For feedstocks sourced within the UK, a non-exhaustive list of possible evidence sources for demonstrating compliance with the land criteria is available in Annex E:.

9.36 Other sources of information include:

- Guidance documents produced by the European Commission 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[44]
- The European Committee for Standardisation (CEN) prepared principles, criteria, indicators and verifiers to show that biofuels and bioliquids are sustainably produced
- UNEP World Database on Protected Areas (WDPA)[45] - a global resource for highly biodiverse and protected areas
- IUCN Red List[46] - a global list of threatened species and examples of their known geographical ranges, relevant to biodiversity and protected areas
- WWF Wildfinder[47] - a global resource for species distribution, relevant to biodiversity and protected areas
- Reference maps provided by recognised voluntary schemes
- GlobCover[48] - land cover maps based on satellite images
- Biocarbontracker[49] - based on GlobCover, includes analyses of satellite images highlighting vegetation cover change, above-ground biocarbon loss and events of deforestation
- MODIS[50] - temporal data on vegetation cover (250m resolution)
- Landsat[51] - temporal data on vegetation cover (30m resolution), updated on an ongoing basis by the US government
- US Department of Agriculture (USDA) Cropland Data Layers[52] - crop-specific land cover data for the US
- Harmonised World Soil Database, FAO/IIASA[53] - global database on soil information and land cover

[44] http://ec.europa.eu/energy/en/topics/renewable-energy/biofuels/sustainability-criteria
[45] http://www.wdpa.org/
[46] http://www.iucnredlist.org/
[47] http://worldwildlife.org/pages/wildfinder
[48] http://due.esrin.esa.int/globcover/
[49] http://biocarbontracker.com/
[50] http://modis-land.gsfc.nasa.gov/vi.html
[51] http://landsat.gsfc.nasa.gov/
[52] http://www.nass.usda.gov/research/Cropland/metadata/meta.htm
[53] http://webarchive.iiasa.ac.at/Research/LUC/External-World-soil-database/HTML/index.html?sb=1

Land use at 1 January 2008	Description	Carbon stock conditions	Biodiversity conditions
Cropland - non-protected	This category includes cropped land, (including rice fields and set-aside), and agroforestry systems where the vegetation structure falls below the thresholds used for the forest categories[54] . The cropland is not in a nature-protected area.	None	None
Cropland - protected - no interference with nature protection purpose	Same as above, but the cropland is in a nature protection area and the production of the raw material did not interfere with the nature protection purpose.	None	Evidence that the production of the biofuel feedstock did not interfere with the nature protection purposes of the land.
Cropland - protected/protection status unknown	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; or b) the protection status could not be determined.	None	This status of land does not comply with the biodiversity criteria and additional evidence is therefore required to demonstrate compliance (see paragraph 9.34).
Grassland (and other wooded land not classified as forest)	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 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.	GHG emissions from any land-use change must be taken into account in GHG calculations.	Evidence that the land has not been highly biodiverse grassland (see paragraph 9.30).
Highly biodiverse grassland - no change in status	Highly biodiverse grassland is defined as any grassland spanning more than one hectare which is included as a priority grassland habitat under the UK Biodiversity Action Plan.[55] For grasslands located outside of the UK, definitions of highly biodiverse grassland according to the relevant competent authority in that country may be used.	None	Evidence that harvesting of the raw material is necessary to preserve the grassland status (see paragraph 9.30).

[54] Note that perennial crop plantations are classed as cropland under the RTFO.

[55] Further guidance on what constitutes a priority grassland habitat is also available in Annex 2 of the JNCC Guidelines for the Selection of Biological Sites of Special Scientific Interest (SSSIs).

Land use at 1 January 2008	Description	Carbon stock conditions	Biodiversity conditions
	This category cannot be reported for natural grassland that is highly biodiverse. It should only be reported for non-natural highly biodiverse grasslands that would cease to be grassland in the absence of human intervention, where evidence is provided that harvesting of the raw material is necessary to preserve its grassland status.		
Highly biodiverse forest – no change of status	Highly biodiverse forest and other wooded land which is species-rich and not degraded.[56]	None	Evidence that harvesting of the raw material did not interfere with nature protection purposes.
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.	Evidence of no change in status compared to January 2008.	Evidence that the forest in question was not primary forest and that the land, not in a protected area (see paragraph 9.29) or a highly biodiverse forest.
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.	GHG emissions from any land-use change must be taken into account in GHG calculations.	Evidence that the forest in question was not primary forest and that the land, not in a protected area (see paragraph 9.29) or a highly biodiverse forest.
Wetland - no change in status	Land that is covered with or saturated by water permanently or for a significant part of the year.	Evidence of no change in status compared to January 2008.	Evidence that the wetland in question was not primary forest, in a designated protected area (see paragraph 9.29) or a highly biodiverse grassland.
Undrained peatland - no change in status	Undrained peatland is peatland that was not completely drained in January 2008. This includes peatland that was not drained at all and peatland that was partially drained.	Evidence that the land has not been further drained.	Evidence that the peatland in question was not primary forest, in a designated protected area (see paragraph 9.29) or a highly biodiverse grassland.
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	None	None

[56] The Administrator is currently developing specific guidance on how to determine if land is highly biodiverse forest and will provide updated guidance on this matter as soon as it is available.

Land use at 1 January 2008	Description	Carbon stock conditions	Biodiversity conditions
	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[57].		

Table 13 Land use categories and RTFO compliance

The RTFO Sustainable Land Use Standard

9.37 The RTFO Sustainable Land Use Standard can be used to demonstrate compliance with the RTFO land criteria. It comprises five environmental and two social principles. These are sub-divided into criteria and indicators which are set out in Annex F:. Suppliers can undertake independent third-party audits against these criteria as one means of demonstrating compliance with the RTFO land criteria. The audit guidelines outlined in Annex J: should be followed.

9.38 To demonstrate compliance with the full RTFO Sustainable Land Use Standard, parties must carry out an independent third-party audit against the full RTFO Sustainable Land Use Standard criteria, in which the requirements of the RTFO's norm for audit quality are met (Annex J:). 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.

9.39 Audits against the RTFO Sustainable Land Use Standard should take place annually in order to demonstrate continuing compliance with the land criteria.

9.40 The RTFO Administrator strongly recommends that in cases where an existing voluntary scheme is available which has been recognised by the RTFO Administrator for the RTFO land criteria, parties do not carry out independent audits against the RTFO Sustainable Land Use Standard.

The RTFO Biodiverse Grassland Standard

9.41 Suppliers can conduct independent third-party audits against the RTFO Biodiverse Grassland Standard as a means of demonstrating compliance. Specific requirements for the audit of highly biodiverse grassland are detailed in Annex G:. The audit guidelines outlined in Annex J: should also be followed.

9.42 The RTFO Administrator strongly recommends that in cases where an existing voluntary scheme is operational that has been recognised by the RTFO Administrator

[57] This definition is taken from the 2006 IPCC Guidelines for National GHG inventories (Vol 4).

to demonstrate compliance with the highly biodiverse grassland criterion, suppliers do not carry out an audit against the RTFO Biodiverse Grassland Standard.

Alternative options for demonstrating compliance with the forest and soil carbon criteria

9.43 It is strongly recommended that suppliers should use recognised voluntary schemes to demonstrate compliance with the forest and soil carbon criteria.

9.44 Where there is no voluntary scheme available, suppliers can conduct independent third-party audits against the relevant RTFO standards provided in the annexes of this document. The audit guidelines outlined in Annex J: should also be followed. Any supplier wishing to demonstrate compliance through this route should contact the Administrator for further guidance.

9.45 The relevant standards are as follows:

- for the forestry criteria, the RTFO Sustainable Forestry Standard (see Annex H:)
- for the soil carbon criteria, the RTFO Soil Carbon Standard (see Annex I:)

9.46 Audits against the Sustainable Forestry and Soil Carbon standards should take place annually in order to demonstrate continuing compliance with the relevant criteria.

10. 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 renewable fuel supplied meets the sustainability criteria. This chapter outlines the acceptable chain of custody systems and provides guidance on setting up a mass balance chain of custody system where none exists.

Guiding principles

10.1 The purpose of the chain of custody is to ensure that claims made about products are correct. Economic operators must put in place systems that are accurate, reliable and protected against fraud, and to get independent verification that their systems meet these requirements.

10.2 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.

10.3 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 that may be available can be found in Chapter 11.

10.4 For wastes and residues, it is particularly important that the following principles are followed to ensure a robust chain of custody:

- 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

10.5 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 renewable fuel was produced, i.e. the renewable fuel processing plant. In the case of wastes this is the country where the waste arises.
- **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 the physical product or C&S data.
- **Chain of custody:** for the purpose of the RTFO guidance, a chain of custody is a system that links the reported quantities of renewable fuel with certain C&S characteristics to the quantities of feedstocks that 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 renewable fuel 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.

10.6 These sustainability characteristics which need to be identical within each consignment of fuel are:

- fuel type
- fuel feedstock
- fuel production process
- country of origin

- 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

10.7 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.

10.8 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.[58]

10.9 The overall carbon intensity for aggregated consignments is given by calculating a weighted average (by volume for liquids and mass for gasses) of all the carbon intensities of the different consignments.

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

10.10 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)

10.11 Mass balance is the only chain of custody system currently permitted 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.

10.12 Book and claim systems are not allowed. This includes GreenPalm RSPO certified palm oil and equivalence trading.

10.13 Suppliers will need to check whether a voluntary scheme includes an approved chain of custody and whether it covers the entire supply chain, or only a part of it. A supplier must be able to provide proof that it has sourced the relevant feedstocks

[58] 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.

through the certified chain of custody in the form of a certificate or proof of sustainability[59] issued under the voluntary scheme.

When to set up a chain of custody

10.14 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.

10.15 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 recognition that they meet some, but not all, of the RTFO 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 renewable fuel across the duty point (or alternative assessment time). For example, it might only extend from the feedstock producer to the renewable fuel producer and, therefore, may not be in place between the renewable fuel producer and the reporting party who is applying for RTFCs.

10.16 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

10.17 Each party in the renewable fuel 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 RTFO sustainability criteria, and the fuel will therefore not be considered sustainable renewable fuel for the purposes of the RTFO.

Responsibilities and procedures

10.18 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

[59] Voluntary schemes produce documentation that demonstrates that a consignment of renewable fuel or renewable fuel feedstock meets the requirements of the scheme. This document follows the feedstock or renewable fuel along the chain of custody. These documents may have various names depending on the voluntary scheme. For ease this guidance document uses the most typical terminology, that is, certificates or proofs of sustainability.

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

10.19 It is good practice to:

- liaise with the supply chain to ensure awareness of the need for cooperation 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 from 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

The level at which the mass balance should operate

10.20 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 RTFO does not allow companies to operate one single mass balance (units in = units out) approach over more than one geographical location.

10.21 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 10.

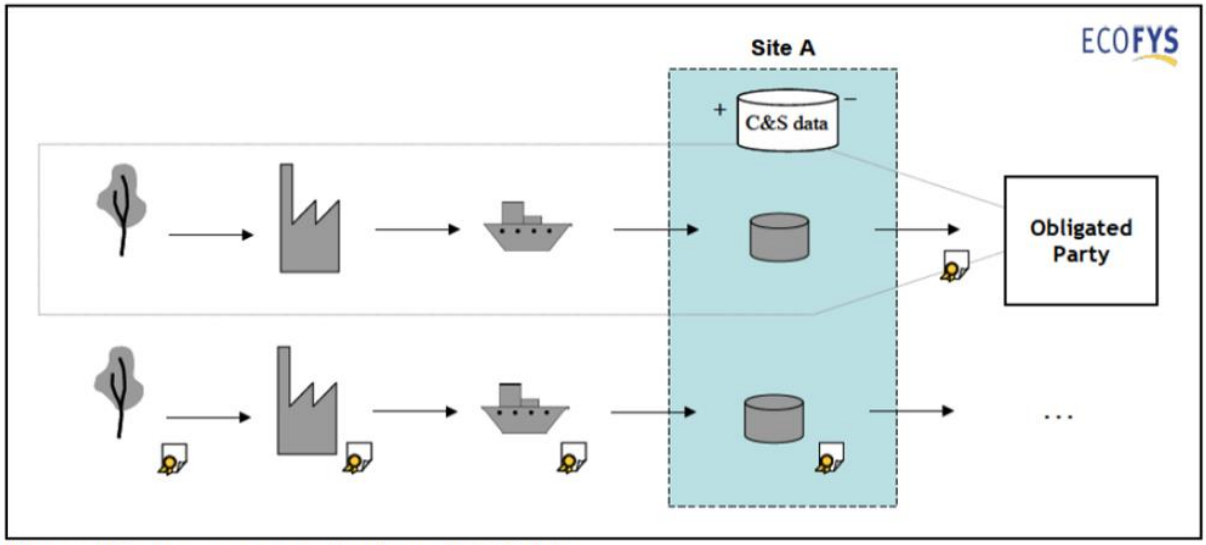

Figure 10 Example of a transfer of C&S data at a site

10.22 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 separate guidance available online.

Timeframe

10.23 It is recommended that parties in the supply chain undertake a periodic inventory of site-level C&S data on at least 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 quantity of renewable fuel on the site.

10.24 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.

10.25 Parties must use the specified balancing up periods used by the voluntary scheme, which is typically of three months.

Record keeping

10.26 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

10.27 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 application these records should include at least:

- invoice reference(s)
- a description of the physical product to which the C&S data refer
- the quantity of physical input/output to which the C&S data refer
- the supplying/receiving company
- transaction date
- any C&S data

10.28 When reporting using a voluntary scheme, products should not be entered into the mass balance system until evidence is received (e.g. a proof of sustainability) that the product is compliant with the scheme claimed. Products that do not have the necessary supporting evidence should be recorded separately. When the necessary evidence is received, the fuel can then be moved to the mass balance system recording compliant material. Products should not be sold on as voluntary scheme compliant until the necessary evidence has been received for it.

Conversion factor records

10.29 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.

10.30 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.[60] 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 into the input, output or inventory records as long as the requirements listed here are met

[60] Default inputs and standard values can be found in the RTFO standard data online.

Periodic inventory of C&S data

10.31 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 quantity of inputs with identical C&S data in the respective period. These quantities must coincide with the input records described above
- The quantity of outputs with identical C&S data in the respective period. These quantities 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)

10.32 Example formats for the records described above are illustrated in Annex K**:.**

Selling products with C&S data

10.33 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.

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

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

10.35 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 that 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

10.36 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, country of origin, voluntary scheme, carbon intensity, etc.).

10.37 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'.

10.38 When renewable fuels 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.

10.39 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.

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

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

10.42 Once C&S data has been assigned to renewable fuel at the duty point, the further substitution of the C&S data with a different C&S dataset through the use of mass balance is not permitted[61]. 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 renewable fuels

10.43 Gains and losses of fuel may occur along the fuel chain, for example, through variation in tolerances of meters and tank gauges, spillages and evaporation, or where residual fuel remains in pipework. Suppliers should endeavour to apply

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[61] Note, this is distinct from correcting inaccurate data in relation to the same renewable fuel e.g. as part of the verification process, or due to new information being gleaned from the supply chain.

appropriate controls to minimise such gains and losses. However, where gains and losses do occur, C&S data should be adjusted in proportion to the quantity of fuel gained/lost at regular intervals. The Administrator recommends that one month would be an appropriate timeframe to make any adjustments.

10.44 Where losses of biomethane occur in the supply chain, such losses must also be included in the carbon intensity calculations (except where defaults are used). This is because biomethane (methane) is a greenhouse gas, therefore losses of biomethane should be counted as a GHG emission. For more information, see the separate guidance for biomethane issued by the Administrator.

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

10.45 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 renewable fuel).

10.46 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-renewable fuels 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-renewable fuels 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.

'Mill M' produces and sells sugar cane-derived products (sugar and bioethanol) - see Figure 11. It produces equal quantities of sugar and bioethanol from sugar cane. Mill M has two dedicated plantations, of which only one meets the RTFO sustainability criteria. In total, this mill produces twenty units of sugar cane-derived products: ten units of sugar and ten units of bioethanol. The obligated party to which M sells its bioethanol wishes to claim that the ten units of sugar cane bioethanol it put on the market all meet the RTFO 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 RTFO criteria. This is acceptable because, in this example, no more sustainable bioethanol was sold by Mill A than the quantity of sustainable sugar cane it sourced and converted into ethanol (taking into account relevant conversion factors).

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

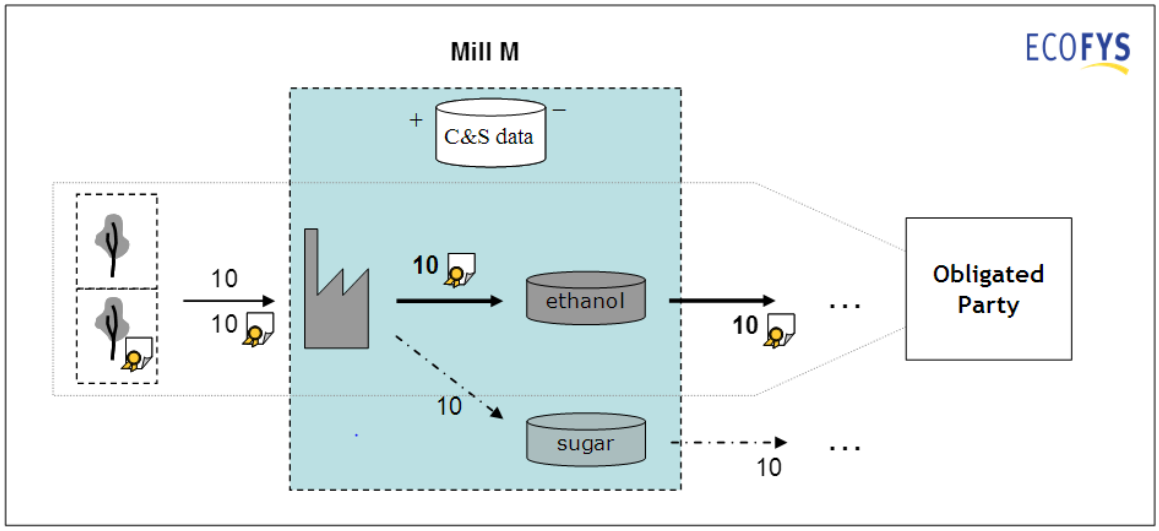

Figure 11 Example of a transfer of C&S data between different feedstock-derived products that is allowed under the RTFO. The certificate represents the flow of certified products.

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

Company A ('Site A') stores and trades in sugar cane-derived products (sugar and bioethanol) - see Figure 12. It sources from several sugar cane mills. One of the sugar cane mills ('Mill M') produces equal quantities of sugar and bioethanol from sugar cane. It has a dedicated plantation that meets the RTFO 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 RTFO 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 RTFO 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.

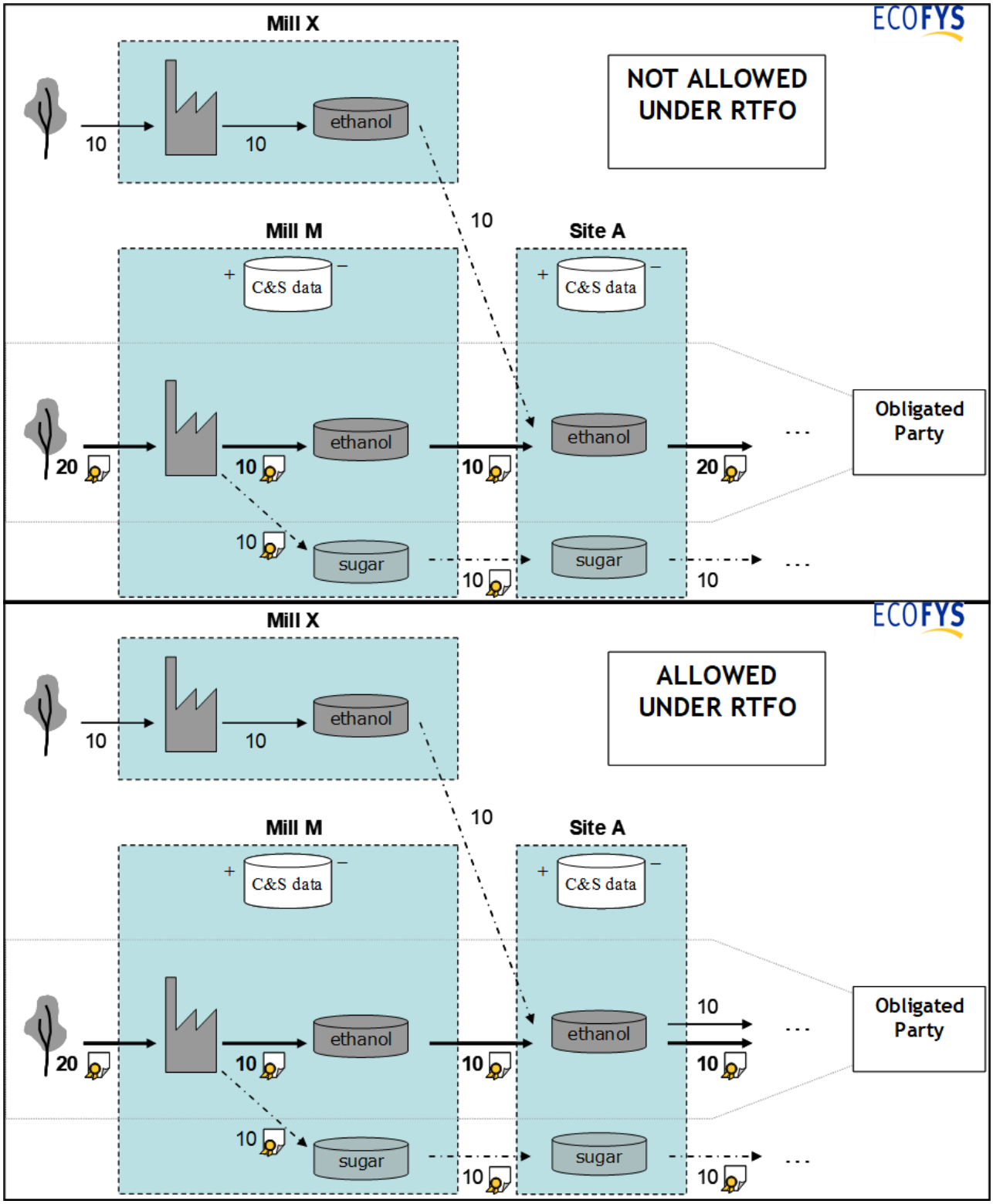

Figure 12 Examples of transfers of C&S data between different feedstock-derived products. The certificate represents the flow of certified products.

11. 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

11.1 As set out in Chapter 10, 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[62]

11.2 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 that 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.

[62] See the Sustainability Compliance Policy in Annex C: for details.

Evidence requirements for key C&S data

Evidence of compliance with recognised voluntary schemes

11.3 Reporting that a biofuel or RFNBO meets a voluntary scheme that has been recognised as meeting one or more of the RTFO sustainability criteria for that fuel type, will be considered to be strong evidence of compliance with those criteria. However, the Administrator reserves the right to request more information where necessary to ensure that the specific requirements of the RTFO Order have been met.

11.4 Voluntary schemes may not cover all of the mandatory criteria of the RTFO. 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 RTFO criteria not covered by the scheme.

11.5 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 generally 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 quantity of renewable fuel must be reported accurately.

11.6 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 renewable fuel.

11.7 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.

11.8 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.

11.9 Each scheme has its own system for tracking registrations and any certificates issued. Some include numbered certificates that 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.

11.10 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.

11.11 Where a voluntary scheme has been used but the version differs from the one that was recognised by the RTFO Administrator, 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 renewable fuel feedstock

11.12 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 quantity of the feedstock whether it is a crop or a waste or a residue.

11.13 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 K:.

11.14 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

11.15 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.

11.16 For RFNBOs, evidence of the amounts of each type of renewable electricity and/or renewable heat and/or purchased will be required, providing assurance that bioenergy or fossil energy inputs have not been used to generate wholly RFNBO fuel quantities. Evidence that the feedstocks (materials providing atoms to the fuel) used (e.g. water, CO_2) 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 11.13). 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. See the dedicated RFNBO guidance for more information.

11.17 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

11.18 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-derived feedstocks, it is also necessary to determine that no change in (RTFO-compliant) carbon stocks took place.

11.19 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.

11.20 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

11.21 Guidance is given in Chapter 9 on sources of evidence that may be available to demonstrate compliance with the land use criteria.

Evidence from audits within the supply chain

Third-party audits or assurance

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

- where a supplier has used a voluntary scheme that has not been recognised by the RTFO Administrator
- 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 one of the RTFO Standards (Annexes G-J)
- as evidence for the use of actual carbon data

11.23 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

11.24 If an audit states that it has been conducted to one of the RTFO Standards (Annexes G-J), 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.

11.25 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.

11.26 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 UK or 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)

11.27 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 supply chain 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 in themselves provide conclusive evidence of meeting the sustainability criteria.

11.28 Where proof of compliance with the RTFO Standards (Annexes G-J) 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 (see Annex J:).

Second-party audits

11.29 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 that requires independence such as ISAE 3000.

11.30 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 the information being checked.

Transport evidence and contracts

11.31 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 renewable fuel, 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.

11.32 Once the feedstock has been processed into renewable fuel, 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 that has sustainability data for UCOME.

Transport documentation

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

11.34 Prior to conversion of the feedstock into renewable fuel, 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 that relate directly to each other.

11.35 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.

11.36 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 quantity data from bills of lading should be consistent with the data in the application for RTFCs.

Contracts

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

11.38 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.

11.39 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. 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

11.40 In the UK, a WTN is a document that is required, by law, to be completed when waste is transferred from one entity to another. There is a list of information that 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.

11.41 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.

11.42 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

11.43 Some shipping companies and other organisations host 'blacklists' of examples of fraudulent documents on their websites[63] which may give some indication of the types of fraudulent documents that exist. None of these lists can be considered official and therefore the nature of the hosting organisation must be taken into account when considering the validity of any evidence provided.

[63] For example see http://www.rosneft.com/Investors/beware/examples/

Other evidence

Technical testing

11.44 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

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

11.46 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

11.47 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

11.48 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

11.49 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.

11.50 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 renewable fuel feedstock was sourced from an area with no land-use change.

11.51 Other forms of evidence may also be available, in addition to those included here.

12. Appointing a verifier

Chapter summary

This chapter provides information on appointing a verifier; the roles and responsibilities of suppliers, verifiers and the RTFO Administrator in respect of this process; and a brief outline of the steps a verifier will undertake. The RTFO Third-Party Assurance Guidance adds detail to the information contained in this chapter.

12.1 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

12.2 Reporting parties are responsible for:

- preparing their data and submitting accurate data in their application for RTFCs[64]
- 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 Third-Party Assurance Guidance and this guidance

[64] 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 Annex A: for details.

- 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
- 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

12.3 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.

12.4 The Third-Party Assurance Guidance outlines the responsibilities for the key steps in the verification process.

Assurance standards - ISAE 3000

12.5 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.

12.6 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.

12.7 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).

12.8 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."[65]

[65] This example is intended to illustrate the concept of the negative form, not an entire assurance conclusion

12.9 Where verification of fuel quantity data is requested for those fuels that do not have a suitable duty point, the Administrator has powers to verify fuel quantity 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.

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

- *"… based on our assessment, the data is free from material misstatement."* [66] The 'reasonable' level of assurance must also be used for verification of development fuels against their eligibility criteria, when this is requested by the Administrator.

12.11 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.

12.12 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@dft.gov.uk) 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

12.13 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."[67] 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.

12.14 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.

12.15 Suppliers should refer to the Third-Party Assurance Guidance for further details.

Professional competencies and capability

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

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[66] This example is intended to illustrate the concept of the positive form, not an entire assurance conclusion.
[67] http://www.ethicsboard.org/iesba-code

12.17 Suppliers should ask verifiers to demonstrate their competencies as part of the appointment process. The Third-Party Assurance Guidance provides further details.

Quality control

12.18 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 Third-Party Assurance Guidance for further details.)

12.19 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.

Preparing for verification

12.20 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.

12.21 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)

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

12.23 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.

12.24 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.

12.25 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.

12.26 It is not necessary to verify data that 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 11 gives suppliers and verifiers help in determining the level of reliance that should be placed on it.

12.27 It is not necessary to verify data that has been provided through a recognised voluntary scheme.

12.28 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: Civil Penalties Policy

A.1 The RTFO Order empowers the Administrator to issue civil penalty notices, including for example on the following grounds:

- if a supplier does not apply for an RTFO account from the Administrator within 28 days of the supplier becoming obligated (see Chapter 1)
- if a supplier does not wholly discharge either of its obligations by either the redemption of RTFCs or making a buy-out payment
- if a supplier or other person fails to submit a verified annual report on the additional sustainability information in the case that they are required to do so
- if a supplier or other person provides information, or evidence to support information, where they have not taken reasonable steps to ensure it is accurate
- where a supplier or other person has taken reasonable steps to ensure that information or evidence (to support that information) is accurate, but the supplier has subsequently become aware (either through their own or another person's actions) that it is inaccurate and has failed to inform the Administrator, within 20 days of becoming aware

A.2 For information, or evidence supporting information, that relates to the establishment of an account, a supplier or other person is not liable for a civil penalty if they inform the Administrator within 20 days of becoming aware (either through their own actions or another party's actions) that the information is no longer accurate. If the Administrator becomes aware that such information or evidence is inaccurate, a supplier is not liable for a civil penalty if the supplier investigates and, if necessary, remedies the inaccuracy within a time period set by the Administrator.

A.3 For information or evidence supporting information that relates to:

- volume information
- an application for an RTFC
- the revocation of an RTFC

A supplier or other person is not liable for a civil penalty if they inform the Administrator within 20 days of becoming aware that the information is no longer accurate, so long as the Administrator is informed before or on the 16 August immediately after the obligation period to which that volume or RTFC relates. This applies whether this is due to the supplier's own actions or another party's actions. If

the Administrator becomes aware that such information or evidence is inaccurate, a supplier is not liable for a civil penalty if they either:

- are not informed of this by the Administrator before or on 16 August immediately after the obligation period to which that volume or RTFC relates
- investigate, and if necessary, remedy, the inaccuracy within a time period set by the Administrator

Communicating civil penalty notices

A.4 A civil penalty notice will be given, by written notice, from the Administrator to the defaulter, detailing the amount, the reason for the penalty and informing the supplier or other person of their rights to appeal.

Amount of civil penalties

A.5 Except in cases where the Administrator is satisfied that an account holder has gained or attempted to gain RTFCs in contravention of the RTFO Order, a civil penalty amount may be up to the lesser of:

- £50,000
- 10% of turnover derived by the account holder from fuels covered by the RTFO Order

A.6 Where the Administrator is satisfied that an account holder has gained or attempted to gain one or more RTFCs in contravention of the RTFO Order, a different rule applies to the calculation of civil penalties. In such cases a civil penalty amount may be up to the lesser of:

- 10% of turnover derived by the account holder from fuels covered by the RTFO Order
- the amount equivalent to twice the value of RTFCs which the account holder gained or attempted to gain (see paragraph A.7)

A.7 For the purposes of paragraph A.6, the value of RTFCs depends on the type of RTFCs and when they were applied for:

- for development fuel RTFCs, the value is always twice the development fuel buyout price of £0.80, so £1.60 per development fuel RTFC.
- for RTFCs which count against the main obligation and where the application was made on or before 31st December 2021, the applicable RTFC value is £0.30, so £0.60 per RTFC
- for RTFCs which count against the main obligation and where the application was made on or after 1st January 2022, the applicable RTFC value is £0.50, so £1.00 per RTFC

Objections to civil penalties

A.8 A supplier or other person who wishes to object to a civil penalty must do so in writing within 28 days of being issued with the civil penalty notice. The supplier must state the grounds for the objection.

A.9 The Administrator will consider the objection and will inform the supplier or other person in writing of the outcome of that consideration.

A.10 The objection will be considered by officials in DfT, other than those working in the RTFO Unit or those involved in the decision to issue the civil penalty notice.

A.11 A supplier or other person may also challenge the outcome of the Administrator's decision through the courts.

Appeals to civil penalties

A.12 An appeal can be made under section 131 of the Energy Act 2004 on either or both of the following grounds: that the recipient considers that they are not liable to pay the penalty and/or that the amount of the penalty is too high.

Unpaid civil penalties

A.13 Where a civil penalty is not paid by the date specified in the civil penalty notice (i) interest may be applied at 5% above the Bank of England base rate (calculated on a daily basis) as of the day before the civil penalty is due and (ii) the total sum will be a debt recoverable by the Administrator.

A.14 Where a supplier objects to, or appeals against, a civil penalty, interest shall accrue while the objection or appeal is being considered, and the supplier shall be liable to pay that interest where an objection or appeal is dismissed.

Annex B: The RTFO obligation expressed as a percentage of total fuel

B.1 Chapter 3 of this guidance document outlines how the obligation is calculated by multiplying the obligated amount by the percentage given in Table 2 (see Paragraph 3.5).

B.2 Paragraph 3.9 explains that while the values in Table 2 are expressed as a percentage of the obligated amount (the volume of fossil and unsustainable renewable fuel), the obligation is also sometimes expressed as a percentage of total fuel (taking into account double counting, see paragraph B.3). Both sets of values are provided in Table 14 to show how they relate to each other.

B.3 Because some renewable fuels which are made from eligible wastes or are RFNBOs are awarded double certificates under the RTFO, this means that the obligation level does not directly show the volume of fuel that needs to be supplied to meet this target. Due to this double counting of certain fuels, the actual amount of fuel supplied will be somewhat less than the stated percentage.

Obligation period (1 Jan – 31 Dec)	Main obligation (% total fuel*)	Main obligation (% obligated amount*)	Development fuel target (% total fuel*)	Development fuel target (% obligated amount*)	Total obligation (% % total fuel*)	Total obligation (% obligated amount*)
2022	11.10%	12.60%	0.80%	0.91%	11.90%	13.51%
2023	11.45%	13.08%	1.00%	1.14%	12.45%	14.22%
2024	11.80%	13.56%	1.20%	1.38%	13.00%	14.94%
2025	12.15%	14.05%	1.40%	1.62%	13.55%	15.67%
2026	12.50%	14.55%	1.60%	1.86%	14.10%	16.42%
2027	12.85%	15.06%	1.80%	2.11%	14.65%	17.17%
2028	13.20%	15.57%	2.00%	2.36%	15.20%	17.92%
2029	13.55%	16.08%	2.20%	2.61%	15.75%	18.69%
2030	13.90%	16.61%	2.40%	2.87%	16.30%	19.47%
2031	14.25%	17.14%	2.60%	3.13%	16.85%	20.27%
2032 onwards	14.60%	17.68%	2.80%	3.39%	17.40%	21.07%

Table 14 The obligation trajectory expressed as a percentage of total fuel and as a percentage of the obligated amount. (*) Please note that due to double counting, the values given will not directly correspond to the actual volume of fuel supplied.

Annex C: Sustainability compliance policy

Introduction

C.1 This annex sets out the RTFO Administrator's policy on undertaking checks on the accuracy of information relevant to the sustainability criteria provided by suppliers and therefore whether the sustainability criteria have been met.

C.2 When applying for RTFCs a supplier must provide a declaration that the information submitted in the application is accurate. Suppliers are also required to seek independent assurance (verification) of their information relating to compliance with the sustainability criteria and submit the assurance report to the Administrator. The supplier is expected to have its own processes and procedures to ensure that it provides accurate information and can therefore make such a declaration of accuracy. Verification and the provision of an assurance report are expected to occur in addition to this. Because compliance with some of the sustainability criteria can only be demonstrated through knowing the origin of the feedstock, information and/or evidence must pass along a chain of custody from the origin to the reporting party. Credible supporting evidence must be in place at each point in the chain so that the accuracy of the information can be checked.

C.3 The Administrator has had regard to the Regulators Compliance in developing this policy.

Assessing applications for RTFCs

C.4 Before issuing RTFCs, the Administrator, amongst other things, must be satisfied, so far as is reasonably practicable, that information related to compliance with the sustainability criteria (C&S data) provided by the supplier is accurate. To reach this level of satisfaction, the Administrator carries out checks on the sustainability information provided by the supplier in an application for RTFCs. In summary, these may include the following four categories of checks:

1 A check that the reported renewable fuel volume figures are consistent with the renewable fuel volume figures submitted to HMRC.

2 A check that the C&S data is consistent with the requirements in this guidance for demonstrating compliance with the sustainability criteria.

3 A check that the verifier's assurance report provides the required assurance that the C&S data has been prepared in accordance with this guidance.

4 A check on the accuracy of the reported C&S data relating to specific consignments of fuel in an RTFC application. Accuracy may be checked through, for example, requesting further information and/or evidence from the supplier. Specific consignments are selected based on an overall assessment of all RTFC applications.

C.5 Further detail on the first three checks listed above can be found in earlier sections of this guidance.

C.6 This annex focuses on the accuracy checks carried out on selected consignments (check four) and sets out the process used to select these individual consignments.

C.7 The Administrator will not issue RTFCs, where, following any of these checks, the Administrator is not satisfied, so far as is reasonably practicable, that information provided by the supplier relating to compliance with the sustainability criteria is accurate.

C.8 Regarding check four, the Administrator uses the following process to check the accuracy of the information on the sustainability criteria for the selected consignments. Each stage is described in more detail in the sections that follow.

1. The Administrator requests further information and/or evidence from the supplier(s) concerned

2. Supplier(s) respond

3. The Administrator assesses the response and determines whether RTFCs should be awarded or not and whether any further action should be taken

4. The Administrator communicates lessons learned to fuel suppliers, verifiers and the wider stakeholder group, as appropriate, and updates its guidance where necessary

Process of selecting consignments for further checks

C.9 When selecting consignments for further checks, the Administrator selects some consignments at random. Other consignments are selected by assessing the likelihood that the sustainability information provided by the supplier for individual consignments is inaccurate, together with the impact if the information was not accurate.

C.10 Identification of factors that influence the likelihood of information in applications for RTFCs being inaccurate ('risk factors') is a dynamic process based on information gathering. This information may come from publicly available sources, other renewable fuel regulators, other UK public bodies, specific allegations from within the industry or the analysis of C&S information and evidence provided. The following paragraphs set out some of the types of risk factor which may be considered.

C.11 Some risk factors are inherent in the nature of the RTFO, such as those raised by an increased incentive provided by double rewarding of fuels.

C.12 The Administrator also considers information related directly to applications which have been submitted. For example, RTFC applications containing inconsistent or unusual C&S data, or limitations or exclusions in the verifier's statement, may increase the likelihood that information on the sustainability criteria is inaccurate.

C.13 Information on individual suppliers may be taken into account. For example, those that have demonstrated good compliance with the regulations may be considered to be less likely to submit applications with inaccurate information than those that have not demonstrated good compliance.

C.14 The Administrator will communicate information on risk factors to suppliers, verifiers and other stakeholders as it considers appropriate. In some instances, there may be issues relating to specific allegations which cannot be publicly communicated.

C.15 In determining the likelihood of information being inaccurate, the Administrator will consider if any risk factors are relevant to the consignment and if so will carry out an assessment that may include looking at:

- whether the supplier has used an approved voluntary scheme
- the severity of any issue with the C&S information
- the nature of any external information relating to the C&S information reported
- the credibility of the source of the information
- the past record of the supplier in complying with the sustainability criteria in the RTFO and any similar legislation, e.g. the Renewable Heat Incentive
- any knowledge the Administrator may have about the supply chain used and its record of compliance
- the nature of the sustainability information reported and the likelihood that it may not be accurate

C.16 In assessing the impact, the Administrator may take several factors into account including:

- the cumulative volume of fuel reported by the supplier with the same C&S characteristic(s)
- the number of RTFCs per litre which have been applied for
- the nature of the sustainability information reported, and the impact of any risks associated with that information (for example, whether or not RTFCs would have been issued if accurate information had been provided in the RTFC application)

Process for further checks

The administrator sets out what it requires from the supplier

C.17 Where an application has been selected for further checks, the Administrator will review the information already provided through ROS and, if necessary, request further information be provided.

C.18 Under the RTFO Order, applications for RTFCs may be made at any time up to 14 May following the end of an obligation period.

C.19 As set out in Chapter 10, a chain of custody must exist from the origin to demonstrate that the C&S data being reported is accurate.

C.20 Where an approved voluntary scheme is used, only the relevant scheme certificate for the consignment of fuel in question is normally required to be produced, with the following exceptions:

- the scheme does not include a certified chain of custody
- there is a gap in the chain of custody between the certificate issue and point of UK supply
- the scheme certificate does not include the required data (e.g. the feedstock type)
- the Administrator requires more information to ensure that the specific requirements of the RTFO Order have been met

C.21 Where an approved voluntary scheme is not used, or where it does not address all the requirements as outlined above, the Administrator may require that documentation is provided that demonstrates the entire chain of custody. For example, this may occur where evidence to demonstrate feedstock or reporting items relating to land use is required.

C.22 When requiring information and/or evidence behind an application, the Administrator may give the supplier an option to provide details of the chain of custody and a list of the evidence which is available for each step before they are asked to provide the evidence in question. This may be part of the evidence pack that was prepared for the verifier in advance of the verification process. The Administrator will review this list to determine whether it is appropriate to select a sample of evidence for review rather than requiring evidence for the entire chain of custody. Whilst it is not a requirement that the supplier holds such a list, the provision of a list is likely to contribute to a quicker outcome.

C.23 The Administrator recognises that supply chains may be complex and involve many different entities, especially close to the origin of the feedstock. It is likely that the Administrator will want to see all of the evidence demonstrating the chain of custody for the later stages of the supply chain. However, it is unlikely that all of the evidence relating to every entity close to the origin will be required for review. By providing a list of the suppliers or information and/or evidence involved, the supplier will facilitate the selection of a sample for review by the Administrator.

Suppliers respond

C.24 If the supplier is unwilling or unable to respond to the request, they may withdraw their application; however, the Administrator will require the supplier to inform them if they subsequently seek to apply for RTFCs on the fuel in question.

The administrator reviews the response

C.25 The Administrator will review the supplier's response and any information and/or evidence provided. If the Administrator is satisfied that the information relating to compliance with the sustainability criteria is accurate for the selected consignment(s), the application for RTFCs will be approved (subject to all other conditions being met).

C.26 If the Administrator is not satisfied that the information provided is accurate and therefore that the sustainability criteria have been met, RTFCs will not be issued. The application will not be accepted. The reasons for not accepting the application will be set out on ROS. A requirement will be placed upon the supplier to inform the Administrator if they subsequently seek to apply for RTFCs for the fuel in question.

C.27 If RTFCs are not issued, the Administrator will consider whether further enforcement action is also necessary such as the imposition of a civil penalty (see Annex A:). If the Administrator is considering additional enforcement action, this may also be communicated in the ROS notification of the non-issue of certificates. Whilst there may be a link between the non-acceptance of an application for RTFCs and the imposition of civil penalties, the Administrator may only consider imposing a civil penalty where a supplier has not taken reasonable steps to ensure that the information or evidence is accurate.

C.28 The circumstances in which certain enforcement actions may be taken and the processes involved, including those for appeal, are set out in earlier sections of this guidance.

C.29 If the Administrator informs the supplier that the evidence provided is insufficient to substantiate the information, the application(s) can be re-submitted at any time up to the final deadline for submission for that obligation period (subject to the requirement to notify the Administrator of this as set out above). Upon re-submission, the Administrator will expect to see additional evidence or further explanation to that already provided and will assess this as set out above.

C.30 In accordance with the mass balance rules, if an application for RTFCs has not been accepted, there must be a volume of unsustainable renewable fuel equivalent to the amount for which RTFCs were not issued in the supplier's account within the supply period (month or quarter) in question. The Administrator will check that this is the case.

C.31 The Administrator will consider whether the outcome of any checks on RTFC applications has changed the risk profile such that other checks on RTFC applications either from the supplier in question, or other suppliers, should be initiated. For example, if an issue with a specific supply chain party was discovered, the Administrator may require that all suppliers declare whether their chain(s) of custody included this party.

C.32 Where an RTFC application has been not been accepted, the Administrator may, where requested by the supplier, comment on the likely outcome of any future application for the same or similar fuel.

Communicating lessons learned

C.33 Communication about a specific application for RTFCs will be directly with the supplier involved. The Administrator is available for discussions with the supplier and the verifier involved.

C.34 The Administrator will not discuss the specifics of a case directly with a verifier without specific written permission from the supplier concerned. However, the Administrator is available for general discussions with individual verifiers.

C.35 The Administrator will use existing communication channels to keep suppliers, verifiers, and the other stakeholders informed of any developments.

Reviewing RTFCs already issued

C.36 Where the Administrator identifies an issue with consignments of renewable fuel supplied for which RTFCs have already been issued, the Administrator may need to

review evidence in respect of that fuel. For example, if it became apparent that some consignments of fuel from a particular supply chain did not meet the mandatory sustainability requirements, the Administrator might need to review the evidence for fuels reported through that supply chain.

C.37 In such a case the Administrator will inform suppliers and request evidence as considered appropriate.

C.38 If, as a result of the investigation, it becomes apparent that RTFCs may have been awarded incorrectly, the Administrator will consider the appropriate actions to take, which may include revocation of the RTFCs.

C.39 There is a process that allows for representations against the revocation of RTFCs and a reconsideration of the decision to revoke as set out in Chapter 6.

Annex D: Default values for biofuels

D.1 Default values are provided in this section for many of the more commonly used biofuel production pathways. These values may be used when calculating the GHG emissions of biofuels as set out in Chapter 8. The defaults are intentionally set conservatively to account for deviation from normal processes.

D.2 Total default values covering the entire production pathway are provided in Table 15 while associated disaggregated default values for individual components of the production pathway are provided in Table 16 & Table 17.

D.3 Suppliers should take note that not all of the total default values in Table 15 meet the GHG emissions saving requirements of the RTFO (see paragraph 8.6) and therefore cannot be used in support of RTFC applications. However, in these circumstances, it is still possible to use the disaggregated default values for that production pathway as part of actual value calculations (see paragraph 8.21).

Default values for biofuels

Biofuel production pathway	Default GHG emissions (gCO2e/MJ)	Default GHG emission saving[1]
Sugar beet ethanol (no biogas from slop, natural gas as process fuel in conventional boiler)	38.2	59%
Sugar beet ethanol (with biogas from slop, natural gas as process fuel in conventional boiler)	25.5	73%
Sugar beet ethanol (no biogas from slop, natural gas as process fuel in CHP plant[2])	30.4	68%
Sugar beet ethanol (with biogas from slop, natural gas as process fuel in CHP plant[2])	22.5	76%
Sugar beet ethanol (no biogas from slop, lignite as process fuel in CHP plant[2])	50.2	47%
Sugar beet ethanol (with biogas from slop, lignite as process fuel in CHP plant[2])	33.9	64%
Corn (maize) ethanol (natural gas as process fuel in conventional boiler)	56.8	40%
Corn (maize) ethanol, (natural gas as process fuel in CHP plant[2])	48.5	48%
Corn (maize) ethanol (lignite as process fuel in CHP plant[2])	67.8	28%
Corn (maize) ethanol (forest residues as process fuel in CHP plant[2])	30.3	68%
Other cereals[3] excluding maize ethanol (natural gas as process fuel in conventional boiler)	58.5	38%
Other cereals[3] excluding maize ethanol (natural gas as process fuel in CHP plant[2])	50.3	46%
Other cereals[3] excluding maize ethanol (lignite as process fuel in CHP plant[2])	71.7	24%
Other cereals[3] excluding maize ethanol (forest residues as process fuel in CHP plant[2])	31.4	67%
Sugar cane ethanol	28.6	70%
The part from renewable sources of ethyl-tertio-butyl-ether (ETBE)	Equal to the ethanol production pathway used	Equal to that of the ethanol production pathway used
The part from renewable sources of tertiary-amyl-ethyl-ether (TAEE)	Equal to that of the ethanol production pathway used	Equal to that of the ethanol production pathway used
Rape seed biodiesel	50.1	47%
Sunflower biodiesel	44.7	52%
Soybean biodiesel	47	50%
Palm oil biodiesel (open effluent pond)	75.5	20%
Palm oil biodiesel (process with methane capture at oil mill)	51.4	45%
Waste cooking oil biodiesel	14.9	84%
Animal fats from rendering biodiesel[4]	20.7	78%
Hydrotreated vegetable oil from rape seed	50.1	47%
Hydrotreated vegetable oil from sunflower	43.6	54%
Hydrotreated vegetable oil from soybean	46.5	51%

Biofuel production pathway	Default GHG emissions (gCO2e/MJ)	Default GHG emission saving[1]
Hydrotreated vegetable oil from palm oil (open effluent pond)	73.2	22%
Hydrotreated vegetable oil from palm oil (process with methane capture at oil mill)	47.9	49%
Hydrotreated oil from waste cooking oil	16	83%
Hydrotreated oil from animal fats from rendering[4]	21.8	77%
Pure vegetable oil from rape seed	40	57%
Pure vegetable oil from sunflower	34.3	64%
Pure vegetable oil from soybean	36.9	61%
Pure vegetable oil from palm oil (open effluent pond)	65.5	30%
Pure vegetable oil from palm oil (process with methane capture at oil mill)	40.3	57%
Pure oil from waste cooking oil	2.2	98%
Wheat straw ethanol	15.7	83%
Waste wood Fischer-Tropsch diesel in free-standing plant	15.6	83%
Farmed wood Fischer-Tropsch diesel in free-standing plant	16.7	82%
Waste wood Fischer-Tropsch petrol in free-standing plant	15.6	83%
Farmed wood Fischer-Tropsch petrol in free-standing plant	16.7	82%
Waste wood dimethylether (DME) in free-standing plant	15.2	84%
Farmed wood dimethylether (DME) in free-standing plant	16.2	83%
Waste wood methanol in free-standing plant	15.2	84%
Farmed wood methanol in free-standing plant	16.2	83%
Fischer – Tropsch diesel from black-liquor gasification integrated with pulp mill	10.2	89%
Fischer – Tropsch petrol from black-liquor gasification integrated with pulp mill	10.4	89%
Dimethylether (DME) from black-liquor gasification integrated with pulp mill	10.2	89%
Methanol from black-liquor gasification integrated with pulp mill	10.4	89%
The part from renewable sources of methyl-tertio-butyl-ether (MTBE)	Equal to that of the methanol production pathway used	Equal to that of the methanol production pathway used
Wet manure (Open digestate, no off-gas combustion[5])	150.5	-60%
Wet manure (Open digestate, off-gas combustion[6])	129.5	-38%
Wet manure (Close digestate, no off-gas combustion[5])	37.2	60%
Wet manure (Close digestate, off-gas combustion[6])	16.2	83%
Maize whole plant (Open digestate, no off-gas combustion[5])	78.1	17%

Biofuel production pathway	Default GHG emissions (gCO2e/MJ)	Default GHG emission saving[1]
Maize whole plant (Open digestate, off-gas combustion[6])	57.1	39%
Maize whole plant (Close digestate, no off-gas combustion[5])	55.5	41%
Maize whole plant (Close digestate, off-gas combustion[6])	34.5	63%
Biowaste[7] (Open digestate, no off-gas combustion)	75.3	20%
Biowaste[7] (Open digestate, off-gas combustion)	54.3	42%
Biowaste[7] (Close digestate, no off-gas combustion)	39.6	58%
Biowaste[7] (Close digestate, off-gas combustion)	18.6	80%

Table 15 Default values for biofuels if produced with no net carbon emissions from land-use change as calculated in accordance with paragraph 8.53.

1. GHG savings relative to the fossil fuel comparator for transport of 94 gCO_2e/MJ.

2. Default values for processes using CHP are valid only if all the process heat is supplied by CHP.

3. “Other cereals” can be barley, wheat, triticale or rye.

4. Applies only to biofuels produced from animal by-products classified as category 1 and 2 material (see guidance issued by the Department for Environment, Food & Rural Affairs for more details on the categorisation of animal by-products). Emissions related to hygenisation as part of the rendering are not considered.

5. This category includes the following categories of technologies for biogas upgrade to biomethane: Pressure Swing Adsorption (PSA), Pressure Water Scrubbing (PWS), Membranes, Cryogenic, and Organic Physical Scrubbing (OPS). It includes an emission of 0.03 MJCH4/MJ biomethane for the emission of methane in the off-gases.

6. This category includes the following categories of technologies for biogas upgrade to biomethane: Pressure Water Scrubbing (PWS) when water is recycled, Pressure Swing Adsorption (PSA), Chemical Scrubbing, Organic Physical Scrubbing (OPS), Membranes and Cryogenic upgrading. No methane emissions are considered for this category (the methane in the off-gas is combusted, if any).

7. Biowaste is defined as biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants and agroindustrial processing. It does not include forestry residues, manure, sewage sludge, or other biodegradable waste such as natural textiles, paper or processed wood. It also excludes those by-products of food production that never become waste.

Disaggregated default values for biofuels

Biofuel production pathway	Cultivation, e_{ec} (incl. N_2O)	Cultivation, e_{ec} (N_2O only)	Processing, e_p	Processing, e_p (Oil extraction only)	Transport, e_{td}	Transport, e_{td} (final fuel only)
Sugar beet ethanol (no biogas from slop, natural gas as process fuel in conventional boiler)	9.6	4.9	26.3	0	2.3	1.6
Sugar beet ethanol (with biogas from slop, natural gas as process fuel in conventional boiler)	9.6	4.9	13.6	0	2.3	1.6
Sugar beet ethanol (no biogas from slop, natural gas as process fuel in CHP plant[1])	9.6	4.9	18.5	0	2.3	1.6
Sugar beet ethanol (with biogas from slop, natural gas as process fuel in CHP plant[1])	9.6	4.9	10.6	0	2.3	1.6
Sugar beet ethanol (no biogas from slop, lignite as process fuel in CHP plant[1])	9.6	4.9	38.3	0	2.3	1.6
Sugar beet ethanol (with biogas from slop, lignite as process fuel in CHP plant[1])	9.6	4.9	22	0	2.3	1.6
Corn (maize) ethanol (natural gas as process fuel in conventional boiler)	25.5	13.7	29.1	0	2.2	1.6
Corn (maize) ethanol, (natural gas as process fuel in CHP plant[1])	25.5	13.7	20.8	0	2.2	1.6
Corn (maize) ethanol (lignite as process fuel in CHP plant[1])	25.5	13.7	40.1	0	2.2	1.6
Corn (maize) ethanol (forest residues as process fuel in CHP plant[1])	25.5	13.7	2.6	0	2.2	1.6
Other cereals[2] excluding maize ethanol (natural	27	14.1	29.3	0	2.2	1.6

Biofuel production pathway	Cultivation, e_{ec} (incl. N_2O)	Cultivation, e_{ec} (N_2O only)	Processing, e_p	Processing, e_p (Oil extraction only)	Transport, e_{td}	Transport, e_{td} (final fuel only)
gas as process fuel in conventional boiler)						
Other cereals[2] excluding maize ethanol (natural gas as process fuel in CHP plant[1])	27	14.1	21.1	0	2.2	1.6
Other cereals[2] excluding maize ethanol (lignite as process fuel in CHP plant[1])	27	14.1	42.5	0	2.2	1.6
Other cereals[2] excluding maize ethanol (forest residues as process fuel in CHP plant[1])	27	14.1	2.2	0	2.2	1.6
Sugar cane ethanol	17.1	2.1	1.8	0	9.7	6
The part from renewable sources of ethyl-tertio-butyl-ether (ETBE)	Equal to that of the ethanol production pathway used					
The part from renewable sources of tertiary-amyl-ethyl-ether (TAEE)	Equal to that of the ethanol production pathway used					
Rape seed biodiesel	32	17.6	16.3	4.2	1.8	1.3
Sunflower biodiesel	26.1	12.2	16.5	4	2.1	1.3
Soybean biodiesel	21.2	13.4	16.9	4.4	8.9	1.3
Palm oil biodiesel (open effluent pond)	26	16.5	42.6	29.2	6.9	1.3
Palm oil biodiesel (process with methane capture at oil mill)	26	16.5	18.5	5.1	6.9	1.3
Waste cooking oil biodiesel	0	0	13	0	1.9	1.3
Animal fats from rendering biodiesel[3]	0	0	19.1	6.1	1.6	1.3
Hydrotreated vegetable oil from rape seed	33.4	18	15	4.4	1.7	1.2
Hydrotreated vegetable oil from sunflower	26.9	12.5	14.7	4.1	2	1.2

Biofuel production pathway	Cultivation, e_{ec} (incl. N_2O)	Cultivation, e_{ec} (N_2O only)	Processing, e_p	Processing, e_p (Oil extraction only)	Transport, e_{td}	Transport, e_{td} (final fuel only)
Hydrotreated vegetable oil from soybean	22.1	13.7	15.2	4.6	9.2	1.2
Hydrotreated vegetable oil from palm oil (open effluent pond)	27.3	16.9	38.9	30.7	7	1.2
Hydrotreated vegetable oil from palm oil (process with methane capture at oil mill)	27.3	16.9	13.6	5.4	7	1.2
Hydrotreated oil from waste cooking oil	0	0	14.3	0	1.7	1.2
Hydrotreated oil from animal fats from rendering[3]	0	0	20.3	6	1.5	1.2
Pure vegetable oil from rape seed	33.4	17.6	5.2	4.4	1.4	0.8
Pure vegetable oil from sunflower	27.2	12.2	5.4	4.2	1.7	0.8
Pure vegetable oil from soybean	22.2	13.4	5.9	4.7	8.8	0.8
Pure vegetable oil from palm oil (open effluent pond)	27.1	16.5	31.7	30.5	6.7	0.8
Pure vegetable oil from palm oil (process with methane capture at oil mill)	27.1	16.5	6.5	5.3	6.7	0.8
Pure oil from waste cooking oil	0	0	0.8	0	1.4	0.8
Wheat straw ethanol	1.8	0	6.8	0	7.1	1.6
Waste wood Fischer-Tropsch diesel in free-standing plant	3.3	0	0.1	0	12.2	1.2
Farmed wood Fischer-Tropsch diesel in free-standing plant	8.2	4.4	0.1	0	8.4	1.2
Waste wood Fischer-Tropsch petrol in free-standing plant	3.3	0	0.1	0	12.2	1.2
Farmed wood Fischer-Tropsch petrol in free-standing plant	8.2	4.4	0.1	0	8.4	1.2

Biofuel production pathway	Cultivation, e_{ec} (incl. N_2O)	Cultivation, e_{ec} (N_2O only)	Processing, e_p	Processing, e_p (Oil extraction only)	Transport, e_{td}	Transport, e_{td} (final fuel only)
Waste wood dimethylether (DME) in free-standing plant	3.1	0	0	0	12.1	2
Farmed wood dimethylether (DME) in free-standing plant	7.6	4.1	0	0	8.6	2
Waste wood methanol in free-standing plant	3.1	0	0	0	12.1	2
Farmed wood methanol in free-standing plant	7.6	4.1	0	0	8.6	2
Fischer – Tropsch diesel from black-liquor gasification integrated with pulp mill	2.5	0	0	0	7.7	2
Fischer – Tropsch petrol from black-liquor gasification integrated with pulp mill	2.5	0	0	0	7.9	2
Dimethylether (DME) from black-liquor gasification integrated with pulp mill	2.5	0	0	0	7.7	2
Methanol from black-liquor gasification integrated with pulp mill	2.5	0	0	0	7.9	2
The part from renewable sources of methyl-tertio-butyl-ether (MTBE)	Equal to that of the methanol production pathway used					

Table 16 Disaggregated default values for biofuels (excluding biomethane). All values are in gCO2e/MJ.

1. Default values for processes using CHP are valid only if all the process heat is supplied by CHP.

2. “Other cereals” can be barley, wheat, triticale or rye.

3. Applies only to biofuels produced from animal by-products classified as category 1 and 2 material (see guidance issued by the Department for Environment, Food & Rural Affairs for more details on the categorisation of animal by-products). Emissions related to hygenisation as part of the rendering are not considered.

Biomethane production pathway	Cultivation	Processing	Upgrading	Transport	Compression at filling station
Wet manure (Open digestate, no off-gas combustion[1])	0	117.9	27.3	1	4.6
Wet manure (Open digestate, off-gas combustion[2])	0	117.9	6.3	1	4.6
Wet manure (Close digestate, no off-gas combustion[1])	0	4.4	27.3	0.9	4.6
Wet manure (Close digestate, off-gas combustion[2])	0	4.4	6.3	0.9	4.6
Maize whole plant (Open digestate, no off-gas combustion[1])	18.1	28.1	27.3	0	4.6
Maize whole plant (Open digestate, off-gas combustion[2])	18.1	28.1	6.3	0	4.6
Maize whole plant (Close digestate, no off-gas combustion[1])	17.6	6	27.3	0	4.6
Maize whole plant (Close digestate, off-gas combustion[2])	17.6	6	6.3	0	4.6
Biowaste[3] (Open digestate, no off-gas combustion)	0	42.8	27.3	0.6	4.6
Biowaste[3] (Open digestate, off-gas combustion)	0	42.8	6.3	0.6	4.6
Biowaste[3] (Close digestate, no off-gas combustion)	0	7.2	27.3	0.5	4.6
Biowaste[3] (Close digestate, off-gas combustion)	0	7.2	6.3	0.5	4.6

Table 17 Disaggregated default values for biomethane. All values are in gCO2e/MJ.

1. This category includes the following categories of technologies for biogas upgrade to biomethane: Pressure Swing Adsorption (PSA), Pressure Water Scrubbing (PWS), Membranes, Cryogenic, and Organic Physical Scrubbing (OPS). It includes an emission of 0.03 MJCH4/MJ biomethane for the emission of methane in the off-gases.

2. This category includes the following categories of technologies for biogas upgrade to biomethane: Pressure Water Scrubbing (PWS) when water is recycled, Pressure Swing Adsorption (PSA), Chemical Scrubbing, Organic Physical Scrubbing (OPS), Membranes and Cryogenic upgrading. No methane emissions are considered for this category (the methane in the off-gas is combusted, if any).

3. Biowaste is defined as biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and comparable waste from food processing plants and agroindustrial processing. It does not include forestry residues, manure, sewage sludge, or other biodegradable waste such as natural textiles, paper or processed wood. It also excludes those by-products of food production that never become waste.

Annex E: Land use evidence sources

E.1 This annex contains tables, compiled by Defra, which aim to assist economic operators with the types and sources of evidence that might be used to show that the biofuels from the UK have been sourced in a manner that is consistent with the land-related sustainability criteria in the RTFO Order.

E.2 It is important to note that the evidence suggestions in the tables have not been designed specifically to show compliance with the sustainability criteria nor are they meant to be an exhaustive list. The tables also attach no priority to the evidence options. It is for the economic operator (and their verifier) to ensure that the evidence provided is sufficient to demonstrate that their biofuel meets all the relevant sustainability criteria.

E.3 In some cases, one piece of evidence could be considered sufficient and in others several pieces might be necessary; it will depend on individual circumstances. In many cases, Local Records Centres[68] will be a useful source of information and evidence. The statutory nature conservation bodies and the Forestry Commission / Forest Service (in Northern Ireland) (for woodland-related evidence) will be able to help in some instances and there are a number of web-based sources which could provide information, particularly on land cover in 2008. Note that some suppliers may levy a charge for their information.

E.4 It is important to note that the suggestions in the tables below are for biofuels sourced in the UK. The suggestions are not meant to demonstrate compliance with other relevant laws, whether they be environmental or otherwise. The economic operator will need to ensure that their biofuel does not contravene any relevant laws.

E.5 Table 18 provides suggested evidence for demonstrating land status and Table 19 provides suggested evidence for demonstrating that the land status has not changed.

[68] Local Records Centres (LRCs) are organisations that collect, collate, manage and disseminate information relating to the biodiversity and geodiversity of a region on a not-for-profit basis. This information plays an essential role in decision-making at all levels, and its use helps to protect and improve biodiversity and geodiversity within the region and beyond.

E.6 As well as the tables this document contains sections covering the following resources:

- Useful websites
- Area types designated for nature protection purposes
- Advisory thresholds and information to show that the harvesting of non-natural grassland is required to maintain the grassland status

Sustainability criteria	**Suggested types of evidence that might show the land status**	**Sources of evidence in the UK (see** Useful websites)
Areas designated for nature protection purposes Areas designated for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements	Maps of designated areas with details of designation date	Local Record Centres Statutory nature conservation bodies[69] National Biodiversity Network Gateway Other websites
Highly biodiverse grasslands, wetlands, continuously forested areas, lightly forested areas and peatlands	Farm and other records (e.g. aerial photos, satellite images, land use/cover maps) showing land status Farm or other records showing land has been cultivated in accordance with the Environmental Impact Assessment (Agriculture) Regulations Habitat inventories for conservation priority habitats	Farm records Local Record Centres Centre for Ecology and Hydrology (land cover map) National Biodiversity Network Gateway Statutory nature conservation bodies
Continuously forested areas and lightly forested areas	Woodland and forest inventories	Local Record Centres Forestry Commission Northern Ireland Forest Service Other websites

Table 18 Suggested types of evidence that might show land status and the sources of that evidence in the UK

[69] Natural England, Northern Ireland Environment Agency, Natural Resources Wales, Scottish Natural Heritage, Joint Nature Conservation Committee

Sustainability criteria	**Suggested types of evidence that might show the special circumstances are relevant**	**Sources of Information in the UK (see** Useful websites**)**
Areas designated for nature protection purposes	Statement from an expert that the cultivation has not interfered with the nature protection purposes of the designated area	Certified expert – The Chartered Institute of Ecology and Environmental Management has details of experts.
Areas designated for the protection of rare, threatened or endangered ecosystems or species recognised by international agreements	Farm or other records (e.g. aerial photos, satellite images) showing the land in the designated area has been cultivated in accordance with the Environmental Impact Assessment (Agriculture) Regulations	Farm records Local Record Centres
	Forestry Commission-approved forest plan, Forestry Commission-approved woodland management plan, felling licence, woodland grant scheme showing cultivation is in accordance with UK Forestry Standards	Forestry Commission
Highly biodiverse grasslands	Farm or other records showing that the harvesting of the grassland is consistent with the management prescriptions for the agri-environment scheme associated with the site or a comparable site	Farm records, including agri-environment agreements
	Farm or other records showing that the harvesting of the grassland is consistent with a restoration plan recognised by a nature conservation body for the site or a comparable site	Farm records
	Farm or other records showing that the harvesting of the grassland is in line with the advice at the end of this Annex	Farm records
	Harvesting practices for the grassland are consistent with published research for comparable sites that clearly shows that the harvesting is necessary to preserve the grassland status	Farm records
Highly biodiverse grasslands, wetlands, continuously forested areas, lightly forested areas and peatlands	Land use/cover maps showing the current status of the land (could be used for wetlands, grasslands, woodlands and peatlands) Dated satellite images (could be used for wetlands, grasslands, woodlands, peatlands) Dated aerial photos (could be used for wetlands, grasslands, woodlands, peatlands) Woodland and forest inventories	Local Record Centres Centre for Ecology and Hydrology (for land cover map) Statutory nature conservation bodies Water authorities - Environment Agency, Scottish Environment Protection Agency Forestry Commission Northern Ireland Forest Service
Peatlands	Statement from a certified expert that the undrained soil in the peatland has not been drained	Certified expert – The Chartered Institution of Water and Environmental Management and/or the Chartered Institute of Ecology and Environmental Management have details of experts.

Table 19 Suggested types of evidence that might demonstrate that the status of the land has not changed and the sources of that evidence in the UK

Useful websites

- Local Records Centres - http://www.alerc.org.uk

Certified experts

- The Chartered Institute of Ecology and Environmental Management - http://www.cieem.net/
- The Chartered Institution of Water and Environmental Management - http://www.ciwem.org/

Statutory nature conservation bodies (and their data/information website links)

- Natural Resources Wales http://naturalresourceswales.gov.uk/
- Welsh protected sites and landscapes map http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/protected-sites-map.aspx?lang=en
- Natural England https://www.gov.uk/government/organisations/natural-england
- MAGIC (Nature on the Map - for England) https://magic.defra.gov.uk/
- Natural England Open Data Geoportal https://naturalengland-defra.opendata.arcgis.com/
- Northern Ireland Environment Agency http://www.doeni.gov.uk/niea/
- Scottish Natural Heritage http://www.snh.gov.uk
- Scottish Natural Heritage Information Service (SNHi) http://www.snh.gov.uk/publications-data-and-research/snhi-information-service/
- Joint Nature Conservation Committee http://www.jncc.defra.gov.uk/

Other data/information websites

- National Biodiversity Network Gateway (UK biodiversity data) https://data.nbn.org.uk/
- UK Post-2010 Biodiversity Framework http://jncc.defra.gov.uk/page-6189, including the UK Biodiversity Action Plan http://jncc.defra.gov.uk/page-5155
- Back on the Map (Northern Ireland's ancient and long-established woodland inventory) http://www.backonthemap.org.uk/
- Scotland's environmenthttp://www.environment.scotland.gov.uk/

Other bodies

- Centre for Ecology and Hydrology http://www.ceh.ac.uk/
- Environment Agency http://www.environment-agency.gov.uk/
- Forestry Commission http://www.forestry.gov.uk/
- Forest Service (in Northern Ireland) http://www.dardni.gov.uk/forestservice/
- Scottish Environment Protection Agency http://www.sepa.org.uk/

Area types designated for nature protection purposes

- Sites of Special Scientific Interest (SSSIs)

- Areas of Special Scientific Interest (ASSIs) – Northern Ireland only
- National Nature Reserves
- Local Nature Reserves
- Areas of Special Protection (for Birds) – England and Wales only
- Forest Nature Reserves
- Special Areas of Conservation, candidate Special Areas of Conservation and Sites of Community Importance
- Special Protection Areas and potential Special Protection Areas
- Ramsar Sites
- Local Sites
- Areas of Outstanding Natural Beauty – England, Northern Ireland and Wales only
- National Parks – England, Scotland and Wales only
- The Broads – England only
- Heritage Coasts – England and Wales only

Advisory thresholds and information to show that the harvesting of non-natural grassland is required to maintain the grassland status

For neutral grasslands and fen meadows:

- Neutral grassland and fen meadows will normally be subject to a single summer hay cut between late June and late July. However, a later cut in late August or September, one year in five, may be required to allow seed production of late flowering species. Cutting dates are weather dependent and may be later in the north of Scotland.
- The growth should be cut back to a height of approximately 5cm and the cut grass, weather permitting, should be dried on site and baled within seven days of cutting.
- Sustained early cutting in May to mid-June is known to reduce species richness, harm breeding birds and insects. Persistent late cutting can cause rank, less diverse vegetation.
- Cutting for silage is generally viewed as harmful to these grasslands as it is associated with more intensive farm management practices, such as fertilisation to increase production and enable two or three cuts to be taken. The first cut typically takes place in late May before farmland birds have had their chicks and before meadow species have flowered and set seed. This reduces the quantity of seed that is returned to the soil. However, an occasional silage cut at hay time (see first bullet) is unlikely to change the plant species composition.

For calcareous or acid grasslands:

- Calcareous or acid grasslands are typically less productive than neutral grasslands and are usually managed as pasture, being grazed as livestock with no hay cut. Where a cutting regime is implemented (e.g. in the absence of grazing), between one and three cuts would normally be taken per year depending on geographic location. Generally, fewer cuts are necessary at higher latitudes in order to maintain sward composition and condition, and therefore closely replicating usual local livestock grazing regimes.
- Precise timings of cutting would be influenced by the composition of the sward, rare species present, the prevailing weather conditions in any given year as well as

geographic location, where cutting dates tend to be later at higher latitudes. Cuts in May, June and July to a height of 5cm with the grass removed within three days should help to maintain the conservation interest, although cutting dates may be later than this, for example, in the north of Scotland. Regional differences should always be taken into account.

Summary of grassland types

- Neutral grasslands include upland hay meadows, and lowland meadows.
- Fen meadows are components of purple moor grass and rush pastures.
- Calcareous grasslands include lowland calcareous grasslands and upland calcareous grasslands.
- Acid grasslands include lowland dry acid grasslands and upland acid grasslands.

Descriptions of these grasslands can be found on the JNCC website at: http://jncc.defra.gov.uk/page-5155 and http://jncc.defra.gov.uk/page-2.

Annex F: RTFO Sustainable Land Use Standard

Annex summary

This annex describes the criteria of the RTFO Sustainable Land Use Standard. The sustainability criteria should be used by suppliers wishing to conduct their own independent field audits of cultivated feedstocks against the RTFO Sustainable Land Use Standard.

The Standard provides an optional tool to demonstrate compliance with the RTFO land criteria, particularly for use when existing voluntary schemes are not available or operational.

F.1 The RTFO Sustainable Land Use Standard contains both environmental and social criteria as well as the norm for audit quality (see Annex J:). All criteria and indicators (including those of the norm for audit quality) must be complied with for the RTFO Sustainable Land Use Standard to be met.

F.2 The 'recommended' criteria and indicators are not required for the RTFO Sustainable Land Use Standard to be met but are considered good practice.

F.3 The RTFO Administrator will keep the criteria and indicators for the RTFO Sustainable Land Use Standard under review, as well as the status of mandatory and recommended criteria, to ensure their continuing relevance.

Environmental criteria and indicators

F.4 The environmental sustainability criteria and indicators (and recommended criteria) for the RTFO Sustainable Land Use Standard are divided into five principles:

- Principle 1: Carbon Conservation - Biomass production will not destroy or damage large above or below-ground carbon stocks (see Table 20)
- Principle 2: Biodiversity Conservation - Biomass production will not lead to the destruction or damage of high biodiversity areas (see Table 21)

- Principle 3: Soil Conservation - Biomass production does not lead to soil degradation (see Table 22)
- Principle 4: Sustainable Water Use - Biomass production does not lead to the contamination or depletion of water sources (see Table 23)
- Principle 5: Air Quality - Biomass production does not lead to air pollution (see Table 24)

Criterion	Indicators
1.1 Preservation of above and below-ground carbon stocks (reference date 01/01/2008).	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.

Table 20 Criteria and indicators for Principle 1: Carbon Conservation

Criterion	Indicators
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[70] and CITES[71]. 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[72]: 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[73]; - UCN List of Protected Areas categories I, II, III and IV[74], according to the list

[70] Convention on Biological Diversity: http://www.cbd.int/

[71] http://www.cites.org/

[72] The definition of the 6 High Conservation Values can be found at http://www.hcvnetwork.org. Currently, no comprehensive maps exist which define HCV areas. For many areas it will therefore still be necessary to assess whether HCVs are present or not. The following initiatives are helpful in defining areas with one or more HCVs: Conservation International - Biodiversity Hotspots; Birdlife international - Important Bird Areas; The WWF G200 Eco-regions: the regions classified 'vulnerable' or 'critical/ endangered'.; European High Nature Value Farmland

[73] http://whc.unesco.org/en/list

[74] 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;

Criterion	Indicators
	available from 2003[75] or more up-to-date lists or national data; - RAMSAR sites (wetlands under the Convention on Wetlands)[76], according to the available list77 of more up-to-date lists or national data.
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.
2.4 Preservation and/or improvement of the surrounding landscape (Recommendation)	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.

Table 21 Criteria and indicators for Principle 2: Biodiversity Conservation

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 agrochemicals; - 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	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;

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/ .

[75] http://www.unep-wcmc.org/un-list-of-protected-areas_269.html

[76] http://www.ramsar.org/.

[77] http://www.ramsar.org/cda/en/ramsar-documents-list/main/ramsar/1-31-218_4000_0__ .

Criterion	Indicators
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.	- 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 topsoil; - soil salts content.
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. (*Recommendation*)	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.

Table 22 Criteria and indicators for Principle 3: Soil Conservation

Criterion	Indicators
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 agrochemicals; - 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 agrochemicals; - 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.

Table 23 Criteria and indicators for Principle 4: Sustainable Water Use

Criterion	Indicators
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 24 Criteria and indicators for Principle 5: Air Quality

Social criteria and indicators

F.5 The social criteria and indicators for the RTFO Sustainable Land Use Standard are divided into two principles:

- Principle 6: Workers' Rights - biomass production does not adversely affect workers' rights and working relationships (see Table 25)
- Principle 7: Land Rights - Biomass production does not adversely affect existing land rights and community relations (see Table 26)

Criterion	Indicators
6.1 Compliance with national law on working conditions and workers' rights.	Certification applicant must comply with all national laws concerning working conditions and workers' rights.
6.2 Contracts	Certification applicant must supply all categories of employees (incl. temporary workers) with a legal contract in which the criteria below are registered.
6.3 Provision of information	Certification applicant must show evidence that all workers are informed about their rights (incl. bargaining rights).
6.4 Subcontracting	When labour is contracted or subcontracted to provide services for the certification applicant, the certification applicant must demonstrate that the subcontractor provides its services under the same environmental, social and labour conditions as required for this standard.
6.5 Freedom of association and right to collective bargaining.	Certification applicant must guarantee the rights of workers to organise and negotiate their working conditions (as established in ILO conventions 87 and 98). Workers exercising this right must not be discriminated against or suffer repercussions.
6.6 Child labour	Certification applicant must guarantee that no children below the age of 15 are employed. Children are allowed to work on family farms if not interfering with children's educational, moral, social and physical development (the workday, inclusive of school and transport time, to be a maximum of 10 hours).
6.7 Young workers	The work carried out shall not be hazardous or dangerous to the health and safety of young workers (age 15 -17). It shall also not jeopardise their educational, moral, social and physical development.
6.8 Health and safety	All certification applicants must meet basic requirements including potable drinking water, clean latrines or toilets, a clean place to eat, adequate

Criterion	Indicators
	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.
6.9 Wages/ compensation	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. *Recommendations:* The certification applicant must pay the workers for unproductive time due to conditions beyond their control. 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.
6.12 Working hours (*Recommendation*)	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 (*Recommendation*)	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.

Table 25 Criteria and indicators for Principle 6: Workers' Rights

Criterion	Indicators
7.1 Land right issues	The right to use the land can be demonstrated and does not diminish the legal or customary rights of other users and respects important areas for local people.
7.2 Consultation and communication with local stakeholders	Procedures are in place to consult and communicate with local populations and interest groups on plans and activities that may negatively affect the legal or customary rights, property, resources, or livelihoods of local peoples.

Table 26 Criteria and indicators for Principle 7: Land Rights

Annex G: RTFO Biodiverse Grassland Standard

Annex summary

This annex describes the RTFO Biodiversity Standard. This standard 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 biodiversity aspects of the RTFO land criteria. The standard can be used for a stand-alone audit, or alongside the RTFO Sustainable Land Use Standard in Annex F:.

G.1 The RTFO Biodiverse Grassland Standard can be used to demonstrate compliance with the biodiversity aspects of the RTFO land criteria. Third-party field audits against this standard should follow the audit guidelines outlined in Annex J:.

G.2 The RTFO Administrator strongly recommends that in cases where an existing voluntary scheme is operational that has been recognised by the RTFO Administrator to demonstrate compliance with the highly biodiverse grassland criterion, suppliers do not carry out an RTFO Biodiversity Audit and instead seek assessment under the voluntary scheme.

G.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.

G.4 For the purposes of the RTFO, highly biodiverse grassland is defined as any grassland spanning more than one hectare which is included as a priority grassland habitat under the UK Biodiversity Action Plan. Further guidance on what constitutes a priority grassland habitat is also available in Annex 2 of the JNCC Guidelines for the Selection of Biological Sites of Special Scientific Interest (SSSIs). For grasslands located outside of the UK, definitions of highly biodiverse grassland according to the relevant competent authority in that country may be used subject to agreement with the Administrator.

G.5 If it is determined that the land is currently highly biodiverse grassland, it should also be determined whether it is natural or non-natural grassland:

- natural highly biodiverse grassland is grassland that would remain as grassland and that maintains its natural species composition and ecological characteristics and processes in the absence of human intervention
- non-natural highly biodiverse grassland is grassland that would cease to be grassland in the absence of human intervention and that is species-rich and not degraded and which has been identified as being highly biodiverse

G.6 For the purposes of the definition of non-natural grassland in paragraph G.5, species-rich grassland is defined as grassland that satisfies one of the following criteria:

- a habitat of significant importance to critically endangered, endangered or vulnerable species as classified by the International Union for the Conservation of Nature Red List of Threatened Species or other lists with a similar purpose for species or habitats laid down in national legislation or recognised by a competent national authority in the country of origin of the raw material
- a habitat of significant importance to endemic or restricted-range species
- a habitat of significant importance to intra-species genetic diversity
- a habitat of significant importance to globally significant concentrations of migratory species or congregatory species
- a regionally or nationally significant or highly threatened or unique ecosystem

G.7 If, based on the definitions outlined above, the land is judged to currently be non-natural highly biodiverse grassland, the auditor should also seek to establish whether or not the harvesting of material from that land for biofuel production had an impact on biodiversity. The presumption should be that harvesting did have an impact on biodiversity unless evidence is provided to the contrary.

G.8 An audit against the RTFO Biodiverse Grassland Standard can have one of the following outcomes with respect to demonstrating compliance with the RTFO land criteria:

- 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 the RTFO land criteria
- 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 the RTFO land criteria
- If the land is judged to be natural highly biodiverse grassland, then it is judged to be non-compliant with the RTFO land criteria
- If the land is judged to be non-natural highly biodiverse grassland and no impact on biodiversity can be proven that despite harvesting of material from that land for biofuel production, it can be judged to be compliant with the RTFO land criteria, but an annual expert assessment is required to ensure that biodiversity is maintained
- If the land is judged to be non-natural highly biodiverse grassland and it cannot be proven that harvesting of material from that land for biofuel production has no impact on biodiversity, then it is judged to be non-compliant with the RTFO land criteria

G.9 If grassland has already been converted to cropland it is not possible to assess the characteristics of the land itself. In such circumstances, 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.

G.10 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.

G.11 The report outputs from these assessments should be made available to the supplier's independent verifier and to the RTFO Administrator upon request.

Annex H: RTFO Sustainable Forestry Standard

Annex Summary

This annex describes the criteria of the RTFO Sustainable Forestry Standard. The sustainability criteria should be used by suppliers wishing to conduct their own independent field audits of cultivated feedstocks against the RTFO Sustainable Forestry Standard.

The Standard provides an optional tool to demonstrate compliance with the RTFO forestry criteria, particularly for use when existing voluntary schemes are not available or operational.

H.1 The RTFO Sustainable Forestry Standard can be used to demonstrate compliance with the RTFO forestry criteria. Third-party field audits against this standard should follow the audit guidelines outlined in Annex J:.

H.2 All criteria and indicators (including those of the norm for audit quality outlined in Annex J:) must be complied with for the RTFO Sustainable Forestry Standard to be met.

H.3 As well as the required criteria and indicators, the tables below provide suggested evidence, although this is not prescriptive. In line with the options for compliance outlined in paragraph 9.19, auditors may judge that it is not necessary to require evidence at the level of the forest sourcing area for specific criteria or indicators if the required practices are already required by law in the country of origin of the feedstock and their implementation is monitored and enforced.

H.4 Audits against the Standard should take place annually in order to demonstrate continuing compliance with the forest criteria.

H.5 The criteria are divided by the following high-level criteria into individual tables outlining specific criteria, indicators and suggested evidence sources:

- High-Level Criterion 1: the material has not been harvested from wetlands, peatlands or protected land areas unless the land is designated for nature protection purposes and the production of that relevant feedstock did not interfere with the purposes for which the land concerned was an area designated for nature protection purposes (Table 27)
- High-Level Criterion 2: the material has been legally harvested (Table 28)
- High-Level Criterion 3: the material has been harvested in such a way that negative impacts on soil quality and forest biodiversity are minimised and which maintains or improves the long-term production capacity of the forest from which it was harvested (Table 29)
- High-Level Criterion 4: that areas that have been harvested are subject to forest regeneration[78] (Table 30)
- High-Level Criterion 5: that changes in carbon stock associated with forest biomass harvest are accounted for in submissions related to the country's commitment to reduce or limit greenhouse gas emissions through the 'Paris Agreement', or the material has been harvested in such a way that carbon stocks and sinks levels in the forest are maintained or increased over the long term (Table 31)

H.6 The RTFO Administrator strongly recommends that in cases where an existing voluntary scheme is operational that has been recognised by the RTFO Administrator to demonstrate compliance with the forestry criteria, suppliers do not carry out an audit against the RTFO Sustainable Forestry Standard and instead seek assessment under the voluntary scheme.

[78] "Forest regeneration" means the re-establishment of a forest stand by natural or artificial means following the removal of the previous stand by felling or as a result of natural causes, including fire or storm.

Specific Criteria	Indicators	Evidence
Biomass has not been harvested from areas protected by local, regional or national laws in the country of origin or under the conservatorship of national/international protection bodies.	All areas of operation should be thoroughly researched to ensure they do not violate any current laws in the country of origin. This research should expand to international treaties which may deem the land as protected.	▪ Compliance with UK Timber Regulations (Voluntary agreement in place with source country under FLEGT Action plan) Or: ▪ Relevant laws and criteria related to wood harvesting in the country of origin should be documented. A strong legal framework should already be in place in the region. ▪ GIS or other maps showing the exact land areas biomass is obtained from along with any protected areas/regions. ▪ Regional best practices should be adhered to and detailed in standard operating procedures. Field inspections should be used and recorded to verify compliance.
Biomass is not harvested from areas of significant value (including wetlands and peatlands)	The legal, tenure and customary rights of indigenous people and local communities who rely on the forest are respected and protected.	▪ Compliance with UK Timber Regulations (Voluntary agreement in place with source country under FLEGT Action plan) Or: ▪ Agreements in place regarding the rights and tenure of indigenous peoples along with mechanisms to resolve disagreements. ▪ Availability of documents demonstrating collaboration and meetings with the people in these areas. ▪ Interviews by an independent credible third party with these groups and stakeholders to verify there is a good working relationship.
Biomass is not harvested from areas of significant value (including wetlands and peatlands)	Natural undeveloped (no evidence of human impact) forest areas, endangered tree species and areas of value to local wildlife (habitats) have been identified and are protected.	▪ Mapped areas of conservation zones or protected areas (to be protected from logging) ▪ Mapped areas of wetlands and peatlands ▪ A comprehensive survey should be conducted of protected forest land as well as details of threatened and endangered wildlife species in the area. These surveys should be recorded, and guidance provided to suppliers. Field inspections should be used and recorded to verify compliance. ▪ Methods for ensuring these species are protected should be specified in the standard operating procedures/codes of practice. ▪ Periodic monitoring of the impact of harvesting activities on local ecological and biological systems should be conducted. ▪ Data should be made publicly available.
Biomass is not harvested from areas of significant value (including wetlands and peatlands)	Areas of historical and archaeological significance are protected.	▪ Areas of historical significance should be mapped. ▪ Data should be made publicly available.

Table 27 Criteria, indicators, and evidence for high-level criterion 1 of the RTFO Sustainable Forestry Standard, that the material has not been harvested from wetlands, peatlands or protected land areas unless the land is designated for nature protection purposes and the production of that relevant feedstock did not interfere with the purposes for which the land concerned was an area designated for nature protection purposes.

Specific Criteria	Indicators	Evidence
It should be demonstrated that there is a legal right to operate and harvest in the forest.	It should be demonstrated that there is a legal right to harvest wood from the forest and that the harvesting operations have been legally certified. This includes helping to protect the forest from illegal harvesting activities from other parties.	▪ Documents showing legal right of ownership or tenure of the forest. ▪ Written authorisation from the local authority giving permission for harvesting of forestry material. ▪ Harvesting company should be a legally recognised company with professional certification/licensing.
Awareness and compliance with local, regional and national laws in the country of origin and with international treaties.	Harvesting should be compliant with local, regional and national laws from the government in the country of origin as well as international treaties (e.g. EUTR or CITES).	▪ Records should be kept documenting all applicable legal requirements and have details on up-to-date forest legislation and regulations. ▪ Staff should be interviewed to show they have a good understanding and are up-to-date with relevant laws and legislation. ▪ Obtain FLEGT certification
Awareness and compliance with local, regional and national laws in the country of origin and with international treaties	Workers' rights should be protected including the payment of minimum wage and protection of their wellbeing through legal requirements and industry standards.	▪ Records showing payment of at least the minimum wage ▪ Employment contracts demonstrating required employment protections
Awareness and compliance with local, regional and national laws in the country of origin and with international treaties	Declaration of conflicts of interest are made publicly along with a statement of commitment to offer or receive bribes.	▪ Complete visibility in the supply chain. ▪ Public statement that any conflicts of interest will be made public knowledge imminently. ▪ Public statement to commit to not offering or receiving bribes.
Awareness and compliance with local, regional and national laws in the country of origin and with international treaties	All royalties, taxes and tariffs are paid throughout the supply chain.	▪ Comprehensive record of payment receipts and money transactions

Table 28 Criteria, indicators and evidence for high-level criterion 2 of the RTFO Sustainable Forestry Standard, that the material has been legally harvested.

Specific Criteria	Indicators	Evidence
Actions should maintain the land status and the conservation value.	Harvesting must not take place from land that contains dense areas of native tree species where there is no clear evidence of previous human activity (Primary Forest) or where ecological processes are likely to be disturbed.	▪ Verified by a credible third party.
Actions should maintain the land status and the conservation value.	Harvesting and supply activities should not change the forestry status.	▪ Environmental impact assessments should be conducted before operations start. ▪ Adherence to regional best management practices. ▪ Harvesting of non-managed native tree species is prohibited through compliance statements and traceability. Field inspections should be used and recorded to verify compliance. ▪ Canopy coverage is maintained by the use of mass balances. ▪ Monitoring results are recorded. ▪ Records of field inspections. ▪ GIS mapping. ▪ Appropriate safeguards are implemented in the standard operating procedures and codes of practice. ▪ Public commitment to enforcing protection of standards/self-declaration of compliance.
Actions should maintain the land status and the conservation value.	Harvesting and supply activities should minimise any changes to the ecosystem of the forest.	▪ Environmental impact assessments should be conducted before operations start. ▪ Adherence to regional best management practices. ▪ Assessment of operations to define measures to minimise impacts. ▪ Soil surveys and monitoring records. ▪ Information on methods to protect soil. ▪ Interviews with staff should demonstrate appropriate knowledge on best practices and minimising impact. ▪ Information on how threatened and endangered habitats and ecosystems can be protected and maintained should be obtained from relevant resources (e.g. resource experts, natural-resource agencies and internet research). ▪ Public commitment to enforcing protection of standards/self-declaration of compliance.

Table 29 Criteria, indicators and evidence for high-level criterion 3 of the RTFO Sustainable Forestry Standard, that the material has been harvested in such a way that negative impacts on soil quality and forest biodiversity are minimised and which maintains or improves the long-term production capacity of the forest from which it was harvested.

Specific Criteria	Indicators	Evidence
Regeneration plans should restore harvested and low-stock areas with native and desired tree species to a similar or more natural state than pre-harvest.	Native or desired tree species are planted to restore the pre-harvest natural state within 10 years.	▪ Management plan should detail plans for regeneration. ▪ Documentation of operational practices. ▪ Harvesting and regeneration records/inventory are maintained.
	Low-stock areas are identified and regenerated to improve the natural state of the forest.	▪ Management plan should detail plans for regeneration. ▪ Documentation of operational practices. ▪ Regeneration records/inventory are maintained.
	Forest productivity should be maintained.	▪ Mass balances should be used to ensure forest productivity is maintained. ▪ Harvesting and growth rate data should be used to demonstrate that biomass feedstocks are not having a negative impact on forest productivity or health.

Table 30 Criteria, indicators and evidence for high-level criterion 4 of the RTFO Sustainable Forestry Standard, that areas that have been harvested are subject to forest regeneration.

Specific Criteria	Indicators	Evidence
Harvesting of forestry does not impact on the overall effectiveness of the forest as a carbon sink.	Assessment of the impacts of operations on carbon stocks should be conducted.	▪ Environmental Impact Assessment. ▪ Site surveys are recorded and monitored to ensure compliance. ▪ Evidence of policies and objectives for environmentally sound forest management and protection
	Monitoring and evaluation of changes to carbon stocks should be periodically conducted to demonstrate harvesting is not impacting the soil carbon content.	▪ Site surveys are recorded and monitored to ensure compliance. ▪ Management plan should contain periodic sampling in active areas to ensure changes from operations are minimal. ▪ Analysis of historic and current carbon uptake rates should be recorded.
Alternatively, if carbon stocks are not being maintained, then evidence must be provided that these changes in carbon stock are accounted for in the country of origin's submissions as part of their obligations under the Paris Agreement.		

Table 31 Criteria, indicators and evidence for high-level criterion 5 of the RTFO Sustainable Forestry Standard, that changes in carbon stock associated with forest biomass harvest are accounted for in submissions related to the country's commitment to reduce or limit greenhouse gas emissions through the 'Paris Agreement', or the material has been harvested in such a way that carbon stocks and sinks levels in the forest are maintained or increased over the long term.

Annex I: RTFO Soil Carbon Standard

Annex Summary

This annex describes the criteria of the RTFO Soil Carbon Standard. The sustainability criteria should be used by suppliers wishing to conduct their own independent field audits of cultivated feedstocks against the RTFO Soil Carbon Standard.

The Standard provides an optional tool to demonstrate compliance with the RTFO soil carbon criteria, particularly for use when existing voluntary schemes are not available or operational.

I.1 The RTFO Soil Carbon Standard can be used to demonstrate compliance with the RTFO soil carbon criteria. Third-party field audits against this standard should follow the audit guidelines outlined in Annex J:.

I.2 All criteria and indicators (including those of the norm for audit quality outlined in Annex J:) must be complied with for the RTFO Soil Carbon Standard to be met.

I.3 As well as the required criteria and indicators, the tables below provide suggested evidence, although this is not prescriptive. In line with the options for compliance outlined in paragraph 9.16, auditors may judge that it is not necessary to require evidence at the farm level for specific criteria or indicators if the required practices are already required by law in the country of origin of the feedstock and their implementation is monitored and enforced.

I.4 Audits against the Standard should take place annually in order to demonstrate continuing compliance with the soil carbon criteria.

I.5 The RTFO Administrator strongly recommends that in cases where an existing voluntary scheme is operational that has been recognised by the RTFO Administrator to demonstrate compliance with the forestry criteria, suppliers do not carry out an audit against the RTFO Soil Carbon Standard and instead seek assessment under the voluntary scheme.

I.6 The criteria and indicators listed in Table 32 as well as those of the norm for audit quality (see Annex J:) must be complied with for the RTFO Soil Carbon Standard to be met.

Specific Criteria	Indicators	Evidence
Either: Monitoring of soil carbon content	The biomass producer should conduct an assessment of the soil suitability (risk of organic matter degradation for planned crop rotation). Additionally, the biomass producer should conduct regular testing of soil organic matter content and keep a complete track record of measurements.	Risk analysis detailing any risks to soil organic carbon content over the whole rotation. Documented soil carbon analysis
Or: Management plan to maintain/enhance soil carbon content	The biomass producer should have a comprehensive soil management plan this should include a nutrient plan and details of actions to prevent soil degradation. Methods to maintain soil carbon should include techniques such as the following: ▪ A varied crop rotation- this should include a variety of crops with various root depths and longer rotations for high-value crops. Rotations should also include soil regulating/amending crops such as legumes, cover/catch crops for autumn or under-sown crops. ▪ Application of manures. ▪ At least one residue in every 5 rotations is left in the ground. ▪ Applications of high organic carbon such as Biochar, food or green compost, paper crumble, biosolids, mushroom compost or water treatment cake. ▪ Minimising soil losses arising from cultivation. ▪ Use of temporary grass leys.	Evidence of a soil management plan that demonstrates that rotational cropping is performed utilising a mix of different crop species, and preferably incorporating a root crop or a legume species or a period of short term grass ley, or evidence of use of cover crops to reduce the period of bare fallow and/or adoption of zero tillage (reduced soil disturbance) or evidence of use of application of organic amendments to soil (manures or organic wastes), including retention of residues from other crops in the rotation.
Monitoring/management of soil compaction	Regular visual assessments of soil compaction should be recorded, and appropriate remedial action taken. Over winter, soil compaction should be avoided by using dedicated tramlines and avoiding the use of machinery in wet conditions.	Evidence of autumn cultivations to address compaction problems (e.g. moling operations) and any surface flooding
Preventing soil erosion	Prevent soil erosion by cultivating compacted tillage soil, leave autumn seedbeds rough, establish winter crops early, prevent livestock from winter grazing, use trees and fences as flood barriers and ensure field drainage is sufficient.	On vulnerable soils (silts and sandy soils) - evidence of timely cultivations and approaches to reduce risk of wind blow and runoff (minimum periods of bare soil)

Table 32 Criteria, indicators and evidence for the RTFO Soil Carbon Standard

Annex J: RTFO Audit Guidelines

RTFO norm for audit quality criteria

J.1 When auditing a farm, plantation or other biomass producer against any of the RTFO standards outlined in Annexes G-J, auditors must also meet the following norm for audit quality (see Table 33 below). The norm is based on criteria which are each assigned a conformance level of either 'major must' (mandatory) or 'minor must' (recommendation).

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

Criterion	Norm	Conformance
	- keep evidence for a minimum period of five years; and - accept responsibility for preparing any information related to the auditing of such evidence.	

Table 33 Norm for audit quality

Additional field guidance for auditors

J.2 In practice, field audits will almost always find minor non-conformances with standards, which do not normally prevent certification. For certification schemes, this is normal practice, including for those voluntary schemes recognised by the RTFO Administrator.

J.3 A definition of minor and major non-conformances is given in the box below. When auditing against the RTFO standards (Annexes G-J), minor non-conformances identified in the field are allowed, and will not prevent a supplier from demonstrating compliance. If any major non-conformances are found, a producer could not report that that feedstock meets the requirements of that RTFO.

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 K: 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

Order no.	Transaction date	Receiving company	Quantity (tonne)	Product	Country of origin	Voluntary scheme[79]	Land use on 1 Jan 2008	Crop yield (t/ha)	Nitrogen fertiliser (kg/ha)
22001	15-4-2011	C1	1,000	Rapeseed	UK	Red Tractor	Cropland - non-protected	3.0	180

Table 34 Example of an output record from a farm[80] supplying certified rapeseed to crusher C1

Order no.	Transaction date	Supplying company	Quantity (tonne)	Product	Country of origin	Voluntary scheme	Land use on 1 Jan 2008	Carbon intensity (gCO_2e/MJ)
22001	15-4-2011	F1	1,000	Rapeseed	UK	Red Tractor	Cropland - non-protected	29.3
22002	15-4-2011	F2	1,000	Rapeseed	UK	Red Tractor	Cropland - non-protected	29.3
22001	15-4-2011	F3	1,000	Rapeseed	UK	-	Cropland - non-protected	29.3

Table 35 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.

[79] It is possible that the renewable fuel or renewable feedstock met the requirements of more than one voluntary scheme.

[80] 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.

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

Table 36 Example record of rapeseed crusher conversion factor

Order number	Transaction date	Receiving company	Quantity (tonne)	Product	Country of origin	Voluntary scheme	Land use on 1 Jan 2008	Carbon intensity (gCO_2e/MJ)
23001	20-4-2011	B	400	Rapeseed oil	UK	Red Tractor	Cropland - non-protected	32
23002	20-4-2011	B	400	Rapeseed oil	UK	-	Cropland - non-protected	32

Table 37 Example of an output record from a crusher

Order number	Transaction date	Supplying company	Quantity (tonne)	Product	Country of origin	Voluntary scheme	Land use on 1 Jan 2008	Carbon intensity (gCO_2e/MJ)
23001	20-4-2011	C1	400	Rapeseed oil	UK	Red Tractor	Cropland - non-protected	32
23002	20-4-2011	C1	400	Rapeseed oil	UK	-	Cropland - non-protected	32

Table 38 Example of an input record from a renewable fuel producer. This producer takes in certified rapeseed oil from crusher C1.

Product	Country of origin	Voluntary scheme	Land use on 1 Jan 2008	Carbon intensity (gCO_2e/MJ)	Inventory (tonne) 15 Apr 2008	Input (tonne)	Output (tonne)	Inventory (tonne) 15 May 2008
OSR	UK	Red Tractor	Cropland - non-protected	32	1,000	800	400	1,400
OSR	Romania	-	Cropland - non-protected	32	2,000	0	0	2,000
OSR	UK	-	Cropland - non-protected	32	0	400	400	0

Table 39 Example of an inventory record of C&S data for crusher C1

Order number	Transaction date	Supplying company	Quantity (tonne)	Product	Country of origin	Voluntary scheme	Land use on 1 Jan 2008	Carbon intensity (gCO_2e/MJ)
22001	20-4-2011	C1	1,200	Rapeseed oil	UK	Red Tractor	Cropland - non-protected	42.5
22002	20-4-2011	C1	4,800	Rapeseed oil	Unknown	-	Unknown	42.5
22005	20-4-2011	C2	400	CPO	Malaysia	RSPO	Cropland - non-protected	42.5
22006	20-4-2011	C2	600	CPO	Malaysia	-	Unknown	42.5

Table 40 Examples of an input record from renewable fuel company B

Order no.	Transaction period	Receiving company	Quantity (tonne)	Fuel type	Feedstock	Renewable fuel production process	Country of origin	Voluntary scheme	Land use on 1 Jan 2008	Plant in operation on or before 5 October 2015	Carbon intensity (gCO2e/MJ)
33001	4-2011	X	300	Biodiesel	Rapeseed oil	-	UK	Red Tractor	Cropland - non-protected	Yes	52
33002	4-2011	X	1,400	Biodiesel	Rapeseed oil	-	Unknown	-	Unknown	Yes	52

Table 41 Example of an output record from renewable fuel company B

Order number	Transaction period	Supplying company	Quantity (tonne)	Fuel type	Feedstock	Renewable fuel production process	Country of origin	Voluntary scheme	Land use on 1 Jan 2008	Plant in operation on or before 5 October 2015	Carbon intensity (gCO2e / tonne)
33001	4-2011	B	300	Biodiesel	Rapeseed oil	-	UK	Red Tractor	Cropland - non-protected	Yes	52
33002	4-2011	B	1,400	Biodiesel	Rapeseed oil	-	Unknown	-	Unknown	Yes	52
33005	4-2011	B	100	Biodiesel	CPO	No methane capture	Malaysia	RSPO	Cropland - non-protected	Yes	68
33006	4-2011	B	200	Biodiesel	CPO	Unknown	Unknown	-	Unknown	Yes	68

Table 42 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

Ref. no.	Supply date	Receiving company	Material supplied	Quantity, litres	Origin
1234	16 Mar 13	Collector 1	UCO	100	UK

Table 43 Example of an output record from a restaurant; The restaurant is supplying used cooking oil (UKO) to a UCO collector.

Ref. no.	Date collected	Supplier	Material collected	Quantity, litres	Origin	CI
1234	16 Mar 13	Restaurant 1	UCO	100	UK	Default
2345	17 Mar 13	Restaurant 2	UCO	200	UK	Default

Table 44 Example of an input record from a UCO collector/aggregator. The UCO collector collects UCO from a number of restaurants.

Ref. no.	Date supplied	Receiving company	Material supplied	Quantity, litres	Origin	Voluntary scheme	CI
3456	20 Mar 13	BPP 1	UCO	300	UK	none	Default

Table 45 Example of an output record from a UCO collector/aggregator. The UCO collector supplies the UCO to a renewable fuel production plant. The collector may also process the UCO into renewable fuel but in this example, it is done by a separate economic operator.

Ref no.	Date received	Supplier	Material supplied	Quantity, litres	Origin	Voluntary scheme	CI
3456	20 Mar 13	Coll 1	UCO	300	UK	none	Default
4567	20 Mar 13	Coll 2	UCO	500	France	none	Default
4568	22 Mar 13	Coll 3	UCO	400	Germany	ISCC EU	Default

Table 46 Example of an input record from a renewable fuel production plant. The renewable fuel production plant receives UCO from a number of UCO collectors.

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

Table 47 Example of an output record from a renewable fuel production plant. The renewable fuel production plant supplies FAME to an oil major. The conversion efficiency from UCO to FAME is 90% so the quantities are adjusted accordingly. Separate records are kept of the conversion factors.

Ref. no.	Date supplied	Supplier	Material supplied	Feedstock	Quantity, litres	Origin	Voluntary scheme	Plant in operation on or before 5 October 2015	CI	Type of GHG data
5678	30 Mar 13	BPP1	FAME	UCO	270	UK	None	Yes	14	Default
6789	30 Mar 13	BPP1	FAME	UCO	450	France	None	Yes	14	Default
7890	30 Mar 13	BPP1	FAME	UCO	360	Germany	ISCC EU	Yes	14	Default
8901	5 Apr 13	BPP2	FAME	UCO	40,000	UK	None	Yes	14	Default
9012	5 Apr 13	BPP2	FAME	UCO	40,000	UK	None	Yes	12	Actual for entire chain

Table 48 Example of an input record for an oil major. The oil major receives FAME from a number of different renewable fuel production plants. Renewable fuel 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.

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

Table 49 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 L: Glossary

Term	Definition
Account holder	An organisation holding an account with the RTFO Administrator.
Actuals	Shorthand for actual carbon values
Application	An administrative batch of fuel. Any amount of biofuel that has a consistent set of sustainability characteristics. Known as an administrative consignment until January 2023.
Biofuel	Fuel made from recently-living biological material.
Biodiversity	Measurement of the variety of different life forms in a given area. High biodiversity is viewed as an indication of a healthy ecosystem.
Carbon defaults	Default carbon intensity values.
Carbon intensity	The rate at which carbon is emitted in relation to the amount of energy produced.
Carbon stock	Measurement of the carbon stored in a given area of land which can go up or down depending on the use of that land. Forests and peatland are examples of land with high carbon stocks.
C&S	Carbon and sustainability
Certificates	Synonymous with RTFCs in this guidance document
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
Dedicated energy crop	Dedicated energy crops are non-food crops including ligno-cellulosic 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.
DDGS	Dried distillers' grains and solubles
Defaults	Shorthand for default carbon values (see carbon defaults above).
Development fuels	Advanced renewable fuels, a target for which applies from January 2019 – see Chapter 4.
Defra	Department for Environment Food and Rural Affairs
DfT	Department for Transport
Economic operator	Any company or organisation involved in the fuel supply chain.
ETBE	Ethyl-tertiary-butyl-ether. A type of biofuel.
FAME	Fatty-acid-methyl-ester. A type of biofuel.
Feedstock	Raw material used to produce renewable fuels
gCO_2e/MJ	Unit of measurement of carbon intensity

Term	Definition
GHG	Greenhouse gas
Grandfathering	Refers to biofuels produced in installations before certain dates and affects the GHG savings requirements.
ha	Hectare
HMRC	Her Majesty's Revenue and Customs
HVO	Hydro treated vegetable oil. A type of biofuel.
Input data	Any information about the renewable fuel production chain which is used to calculate the carbon intensity of the renewable fuel, for example: yield, nitrogen fertiliser inputs or the amount of fuel used in production plant.
Installation	A processing plant that leads to a material modification from any of the relevant feedstock to the finished fuel. It does not include installations solely used for the collection, transportation or storage of the feedstocks.
ILUC	Indirect land-use change. Land-use change (see below) where the cause is at least a step removed from the effect. In the context of this document, it can be taken to mean the knock-on effects on land use resulting from the cultivation of biofuel feedstocks. It is acknowledged to be more difficult to manage or monitor than direct land-use change.
ISO	International Organisation for Standardisation
ISAE	International Standard on Assurance Engagements
Land-use change	The outcome when a particular activity, such as cultivation of biofuel feedstock, results in a change of land use. Generally refers to previously uncultivated land such as forest, peatland or grassland being used for agriculture.
LCA	Life-cycle analysis
MSW	Municipal solid waste. A feedstock.
MTBE	Methyl-tertiary-butyl-ether. A type of biofuel.
NDPB	Non-Departmental Public Body
Obligated supplier	A transport fuel supplier upon whom a renewable transport fuel obligation is imposed.
OSR	Oilseed rape. A feedstock.
Partially-renewable fuel	Fuels that are produced in part from renewable feedstocks and in part from mineral/fossil feedstocks.
PPO	Pure plant oil. A type of biofuel.
POME	Palm oil mill effluent. An effluent from palm oil processing which can be captured and treated to prevent methane emissions.
Renewable fuel	A fuel from a source that is either inexhaustible or can be indefinitely replenished at the rate at which it is used. For the purposes of this document, it refers to biofuels and RFNBOs.
Reporting party	A fuel supplier reporting to the RTFO Administrator.
RFA	Renewable Fuels Agency. An NDPB that administered the RTFO prior to its abolition in April 2011.
RFNBO	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.
RME	Rape methyl ester (biodiesel made from rape seed)

Term	Definition
RO	Renewables Obligation
ROS	RTFO operating system
RTFC	Renewable transport fuel certificate
RTFO	Renewable Transport Fuel Obligation. The statutory instrument used to implement the transport elements of the RED.
RTFO Sustainable Land Use Standard	Set of criteria against which biofuel feedstock production may be audited. Developed from the RTFO Meta Standard.
Selected default	For some inputs to renewable fuel production, the user may select from a list of qualitative options (or selected defaults). For example, they could choose between using biomass or natural gas to provide heat and power. These qualitative options have different default emissions associated with them.
Standard value	Data which is not dependent on the renewable production chain being considered. For example, lower heating values, emissions factors for materials or global warming potentials.
Supplier	Any company or organisation supplying fuel or its precursors e.g. for biofuel this would include the crop and the virgin oil.
UCO	Used cooking oil. A feedstock.
UCOME	Used cooking oil methyl ester (biodiesel made form UCO)
Verifier	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.
Voluntary scheme	Schemes run by independent organisations that offer a route to providing assurance that renewable fuels meet certain sustainability criteria.

Annex M: Summary of changes (since January 2023 version)

Location	Description
Chapter 1, paragraph 1.21	Guidance added on which vessels or craft can be considered an inland waterway vessel or a recreational craft which does not normally operate at sea, with reference to the relevant Merchant Shipping Notice.
Chapter 4, Figure 1	Update to the figure to reflect update the updates CO_2 sourcing rules as per paragraphs 4.25 & 4.26.
Chapter 4, paragraphs 4.25 & 4.26	Updates to the "CO_2 sourcing rules" for RFNBOs to reflect July 2023 updates to the RFNBO guidance.
Chapter 5, paragraph 5.42 & 5.45	Minor updates to reflect the retirement of the CHIEF system and introduction of the customs declaration service (CDS) by HMRC.
Chapter 6	References to administrative consignments renamed to "applications" to match the terminology used in the new ROSlite IT system.
Chapter 7, paragraphs 7.31 - 7.36	Updates to refer to "applications" rather than administrative consignments.
Chapter 8, paragraph 8.53	The 45 gCO2e/MJ credit for where manure is used as a feedstock for biogas and biomethane has been removed.
Chapter 8, paragraph 8.58	Amendments to the definition of e_{ccs} to accommodate forms of carbon sequestration other than geological storage of CO_2.
Chapter 8, paragraph 8.61	Addition of "upstream and relevant process step" to clarify which emissions are to be divided between coproducts.
Annex D	Updates to manure default values to remove the manure credit.