



**Renewable Fuels**  
Assurance Scheme

## **Technical Guidance**

Date: 29<sup>th</sup> April 2022

Version 1.4

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## 1. Introduction

The Renewable Fuels Assurance Scheme (RFAS) provides vehicle fleet, and non-road mobile machinery, operators with independent assurance of the life cycle greenhouse gas emissions and feedstock sustainability performance of renewable fuels sold in the UK. The scheme aims to verify claims made by companies supplying renewable fuels, and blends, regarding their product's GHG emission savings and provenance of raw material feedstocks. The RFAS works alongside the Government's Renewable Transport Fuel Obligation (RTFO), providing a mechanism for guaranteeing that fleet operators are purchasing bulk supplies of sustainable low carbon fuels. The scheme will facilitate fleet operators receiving renewable fuel supply chain specific GHG emission data, thereby ensuring accurate and representative information for company carbon reporting<sup>1</sup> (Scope 3 Emissions). Furthermore, credible GHG emission data will help inform decision making processes regarding vehicle fleet decarbonisation options by demonstrating the merits of sustainable low carbon fuels.

### 1.1 Objectives of the Scheme

- To encourage greater use of renewable fuels by heavy-duty vehicle, and NRMM plant, operators and establish a unique approach to raising the profile and credibility of sustainable low carbon fuels.
- To ensure the provision of reliable, accurate, robust and transparent GHG emissions data reported to vehicle fleet operators by renewable fuel suppliers.
- To give independent assurance of the GHG emissions and sustainability performance of available high blend renewable fuels supplied to the heavy-duty vehicle and off-highway sectors.

### 1.2 RFAS Scope

The RFAS is open to companies who supply renewable fuels to public and commercial fleet operators. Example renewable fuel types include - biodiesel (FAME), hydrotreated vegetable oil (HVO), biomethane, renewable hydrogen, bio-propane and various advanced renewable fuels. The scheme specially covers renewable fuels supplied through the RTFO, and as such is open to producers and suppliers of renewable fuels, including traders and distributors. Transport sectors covered by the scheme are road vehicle and heavy duty off high-way, notably non-road mobile machinery. The RFAS encompasses the complete renewable fuel supply chain from feedstock cultivation or waste raw material collection, production and distribution of the final product to the customer. This is commonly referred to as the well-to-tank (upstream fuel production) pathway, see Figure 1. In the case for renewable hydrogen the fuel pathway would cover - primary energy source, hydrogen production plant, storage, distribution and dispensing at the refuelling station - see Figure 2.

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<sup>1</sup> <https://ghgprotocol.org/corporate-standard>

Figure 1: Example biofuels supply chain

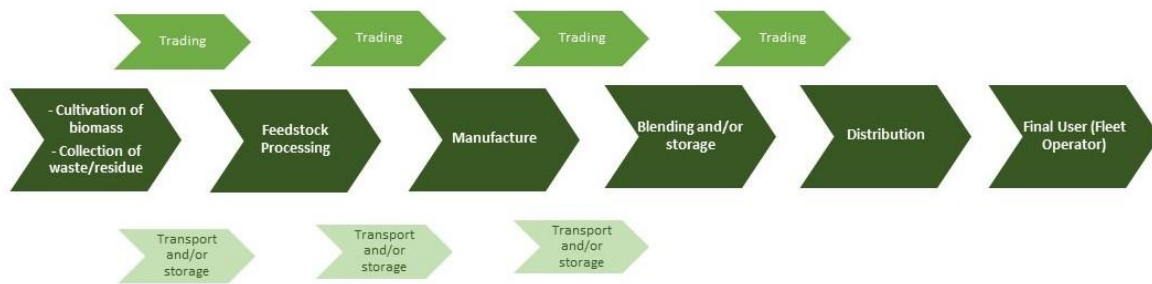


Figure 2: Example hydrogen supply chain



### 1.3 RFAS Performance Standards

The RFAS comprises of three performance standards which companies approved under the scheme are required to meet.

Greenhouse gas (GHG) emission savings threshold:

Renewable fuels shall meet the following minimum GHG emission savings threshold compared to the fossil fuel comparator:

- 65% GHG savings for the renewable fraction, aligning with current obligation targets
- 65% GHG savings for renewable fuels of non-biological origin
- 15% GHG savings for the total blend, ensuring significant savings are achieved and limiting the use of high emissions fuels, such as synthetic fuels, in blends.

Calculations must be based on a lifecycle methodology; refer to Appendix D for details. Fossil fuel comparator carbon intensity can be found in Table D2 within Appendix D.

Feedstock Sustainability

- Protection of land: energy crops shall not be cultivated on land of high biodiversity value or high carbon stock such as wetlands and peatland.
- Use of waste as a resource: a chain of custody will be required to demonstrate provenance of the biomass waste and residues and exclusively those covered under the 'RTFO list of feedstocks including wastes and residues'.<sup>2</sup>

<sup>2</sup> <https://www.gov.uk/government/publications/renewable-transport-fuel-obligation-rtfo-guidance-2021>

- Use of renewable energy and resources for renewable fuels of non-biological origin (RFNBOs): these fuels shall only be produced using energy from renewable sources. Production of renewable hydrogen via electrolysis shall demonstrate additionality with regards to renewable electricity supply. In the case of CO<sub>2</sub> as a feedstock this shall arise from waste fossil sources, biological or atmospheric or naturally-occurring geothermal sources. Applicable requirements are set out in Appendix E.

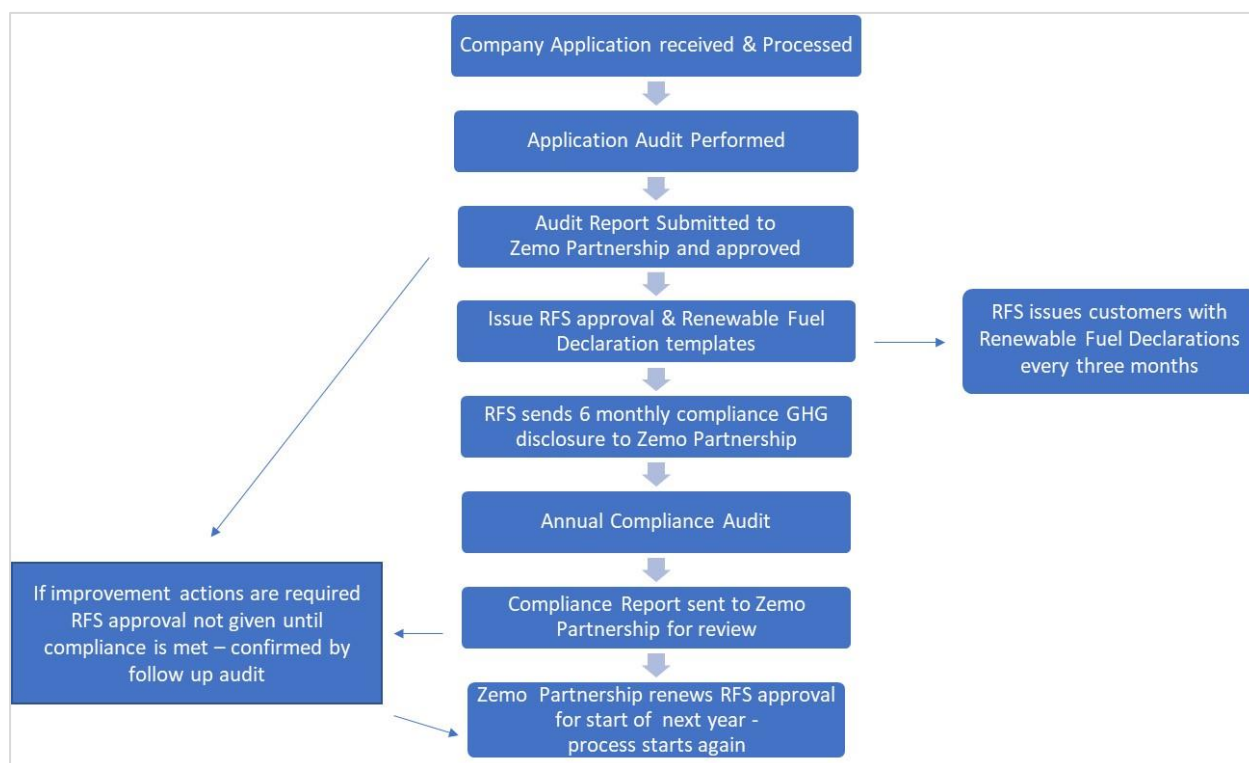
#### Supply Chain Traceability

- The renewable fuel supply chain shall be traceable from feedstock origin to customer refuelling depot in terms of greenhouse gas emission and sustainability performance (see Figure 1).
- There shall be alignment between greenhouse gas emission and sustainability performance of verified renewable fuel reported under the RTFO and batches of renewable fuel sold to fleet operators.

## 2. RFAS Application Process and Compliance Requirements

Companies selling renewable fuels are required to make an application to Zemo Partnership to become an approved Renewable Fuel Supplier (RFS) and submit evidence demonstrating compliance with the RFAS's performance standards – section 2.2. This will require independent verification by an approved auditor. Once approved, the RFS will be required to submit on-going evidence of compliance with the scheme performance criteria, including an annual audit report and a six-monthly 'GHG emission and sustainability disclosure'. The RFS is required to issue their customers with Renewable Fuel Declarations in accordance with batches of renewable fuel sold. Figure 3 shows how the scheme operates.

Figure 3: Renewable Fuels Assurance Scheme Process Flow Diagram



### 2.1 RFAS Application

To become an approved Renewable Fuel Supplier, a company will need to complete the RFAS application form and sign the RFAS agreement once approved.

An 'Application Audit' against the RFAS performance standards will be undertaken by the approved auditor appointed by Zemo Partnership. The 'Application Audit' will be arranged between the Renewable Fuel Supplier and the auditor within one month of submitting the application. The aim of the audit will be to assess the capacity and readiness to comply with Performance Standard.

Once the audit is completed an RFAS Application Audit Report will be sent to the RFS and Zemo Partnership. The application audit will entail a review of the RFS records for the last six months.

Zemo Partnership will approve the application within two weeks of the paperwork being submitted. The following will be issued to the RFS once the application is approved:

- RFS approval document including a unique identified for the company (Appendix C). – This document shall identify the type and blends of renewable fuels supplied by the supplier.
- RFAS agreement letter signed by Zemo Partnership and the RFS. This document will present a set of conditions that the supplier is requested to agree to.
- Renewable Fuel Declaration templates for each renewable fuel and blend supplied, with unique reference numbers for each customer (Appendix D).

## **2.2 Compliance Audits and Ongoing Monitoring**

### Renewable Fuel Supplier Compliance Monitoring

'Compliance Audits' against the RFAS Performance Criteria will be conducted on an annual basis by Zemo's appointed auditor. The aim of these audits will be monitoring compliance against the RFAS performance standard and will include a sample of the declarations issued to customers. Compliance Audit Report will be prepared by the auditor and sent to Zemo Partnership and the RFS within one week following the audit. Zemo Partnership recommends the compliance audit is undertaken between ten and twelve months after the RFS approval document has been issued.

If non-conformities are raised, the RFS has 40 days to take action. An improvement plan will be issued by Zemo Partnership. A follow up audit, and report, will be required to demonstrate compliance. If action is not taken, approval under the RFAS can be terminated.

Zemo Partnership shall issue each company a new RFS Approval Document at the start of the second year of RFAS, once the compliance audit has been reviewed and approved. This process will continue each year. The information to be provided during compliance audit can include:

- Written procedures.
- Mass balance of RTFO verified renewable fuel against customer sales.
- Mass balance of incoming Renewable Fuel Declarations against customer sales.
- GHG emissions of renewable fuel blends.
- Proof of sustainability documentation.
- Voluntary sustainability scheme certification.
- Sales documents –supplier and sales invoices.
- Incoming documents, including renewable fuel purchases (if applicable).
- HMRC records for duty payment.
- Duty payment confirmation.
- RTFO reported quantities and RTFCs issued.
- RFAS claims and logos.
- Renewable Fuel Declarations.

### Six-month GHG and Sustainability Disclosure

Once approval is awarded it is the responsibility of the RFS to send a 'GHG and Sustainability Disclosure' to Zemo Partnership every six months as follows:

- Q1 and Q2 by 15<sup>th</sup> October of the applicable calendar year;
- Q3 and Q4 by 15<sup>th</sup> April of the following year.

Zemo Partnership will send an acceptance email following review and follow up on any queries. The information to be submitted is presented in Appendix C. This information will assist Zemo Partnership monitor the UK high blend renewable fuels market as well having robust well-to-tank GHG emission data for their internal analytical work.

### **2.3 Renewable Fuel Declarations**

Once approved under the RFAS, Zemo Partnership will issue Renewable Fuel Declaration templates with unique reference numbers specific to RFS for each renewable fuel type and blend supplied. RFS are required to have a record keeping system that enables customers to be matched with these specific numbers. New reference numbers will be generated each year of RFAS participation.

The declarations will be issued per customer and per quarter for batches of renewable fuel sold for the full year.

The declaration shall reflect the lifecycle GHG emissions and feedstock sustainability performance of the renewable fuel sold. The information to be included covering each three-month period: customer name and address, renewable fuel sold and proportion of renewable fuel (blend), GHG emission savings, GHG emission intensity, description of feedstocks and status regarding voluntary sustainability scheme certification. Example declarations can be seen in Appendix B. These declarations shall be raised for all batches over 10,000 kgs or 16,000 litres. Zemo Partnership's approval shall be sought if any deviations are needed.

It is essential that the most recently issued declarations are communicated with customers to provide the robust and representative GHG emissions data, in order that they can be used in company carbon reporting.

RFS can only issue Renewable Fuel Declarations to their customers, they cannot be traded or transferred to another renewable fuel suppliers. Declarations are only valid for the periods they cover and specific to each customer. In the event of a RFS selling renewable fuel to a fuel distributor and/or trader, the distributor and/or trader will need to become an approved RFS in its own right if it wishes to benefit from the scheme, and issue declarations to their customers. Fleet contractors and/or logistics companies can become approved under RFAS if declarations are required to be raised for individual customers.

The RFS mass balance and record keeping system shall allow traceability throughout the process for each declaration raised. The declarations shall be made available to the auditor at the time of the compliance audit for a sample to be taken and assess compliance.



### 3. RFAS Performance Standard – Compliance Requirements

A company’s capability to successfully comply with this standard will be verified as part of the ‘Application Process’. ‘Compliance Audits’ will be conducted annually and actual performance against the RFAS will be assessed.

The RFAS focuses on the volumes of renewable fuel reported under the RTFO, therefore the reporting periods and submissions will be based on a calendar year.

#### 3.1 Renewable Fuel Supplier Operations

In order to allow characterization within the RFAS and assess compliance requirements, as part of the initial RFS application companies shall define their RFAS category type, operations and fuels as follows:

**Table 1 – Category type**

Category A	Category B	Category C
Company is registered and reporting under the RTFO; distributing fuel directly to fleet operators or distributing to fuel traders.	Company is purchasing sustainable low carbon fuel from an approved RFS and distributing fuel directly to fleet operators. Company is a fuel trader.	Company is not registered or reporting under the RTFO, distributing renewable fuel to fleet operators or fuel traders.
Basis of Evidence for Compliance		
Evidence of compliance will relate information pertaining to RTFO reporting, issuance of RTFCs and mass balancing of verified renewable fuel against customer sales.	Evidence of RFAS approval will be required. Declaration(s) supplied from the existing RFS, and declaration(s) issued to customers shall be clearly traceable through record keeping and mass balance.	Evidence of compliance is required for the entire supply chain, or from the point in the supply chain when RTFCs have been granted.

#### Renewable fuels and blends

Biodiesel	Bio-propane
Bioethanol	Hydrotreated Vegetable Oils (HVO)
Compressed Biomethane (CBG)	Renewable hydrogen
Liquified Biomethane (LBG)	Others not already listed

#### Processes related to their business activities

Cultivation of feedstocks	Renewable fuel production
Collection of feedstocks	Storage
Feedstocks processing	Blending
Feedstocks transport	Distribution
Trading	Customer/Refuelling Station

If any changes occur during participation in the scheme regarding category type, renewable fuels and blend supplied or supply chain specific process, Zemo Partnership shall be notified in writing.

### **3.2 System Procedures, Responsibilities and Record Control**

The RFS shall implement and maintain written procedures appropriate to its size and complexity to ensure its continuous conformity with the RFAS. These shall include but might not be limited to activity procedures, renewable fuels, blends and key responsibilities.

Records relevant to demonstrate the LCF conformity with the scheme criteria shall be up-to-date and maintained for a period of at least seven (7) years or longer as defined by legislation.

### **3.3 Greenhouse Gas Emission Performance**

The RFS shall provide GHG emission intensity and emission savings figures for renewable fuels, and blends, covered by the scheme.

The methodology used to calculate the GHG emission and supporting data shall be aligned with the Lifecycle Analysis (LCA). See Appendix D.

The RFS shall define the process in place for GHG emission calculations per products and maintain all relevant records.

### **3.4 Feedstock Sustainability Performance**

#### ***Protection of land***

Evidence of RTFO approved voluntary sustainability scheme certification shall be provided for energy crop cultivation. The approved schemes are listed in the RTFO under 'Table of voluntary schemes for RTFO'.

#### ***Use of biomass waste as a resource***

Identification of biomass wastes and residues used for producing renewable fuels is required. Traceability of wastes and residues needs to cover the whole chain of custody, going back to the origin of the material. This could include voluntary sustainability scheme certification and 'Proof of Sustainability' documentation. Categorization of wastes and residues shall be aligned with the RTFO 'List of feedstocks including wastes and residues'.

#### ***Use of renewable energy and resources for RFBNOs***

Identification of RFBNO feedstocks is required including type of renewable energy for power, heat and/or cooling and provenance of CO<sub>2</sub>. Evidence of development fuel RTFCs will suffice as evidence for compliance with requirements for 'additionality' with regards to renewable electricity generation. However, if these are not in place, please refer to further applicable requirements in Appendix E.

### **3.5 Supply Chain Traceability**

To maintain traceability of GHG and sustainability of a renewable fuel throughout the supply chain, from the point of origin to the customer's depot (refuelling station), the following shall be met:

#### ***3.5.1 Supplier Control***

The RFS shall maintain an approved supplier list for their inputs, including:

- Supplier name;
- Applicable registration identifier;
- Feedstocks and/or renewable fuel supplied.

The approved supplier list shall be monitored at least on an annual basis to ensure the information is up to date.

Incoming transaction documentation shall be checked upon receipt for completeness. Information relevant to the applicable scheme(s) shall be included, or as minimum:

- Supplier's name and address;
- Date and location when the document is issued;
- Quantity and type of feedstock and renewable fuel;
- Land criteria compliance if applicable.

If supplier documentation is not compliant, a complaint shall be raised with the fuel supplier.

Confirmation shall be sought from the fuel supplier that the fuel bought has not been used to report under any other initiative scheme and measures have been taken to prevent double counting.

### **3.5.2 Mass balance**

The RFS shall establish a mass balance system to ensure:

- Output quantities of sustainable material sold do not exceed input quantities;
- Total blend volumes sold to commercial fleet operations are aligned with the material reported under the RTFO (if applicable) and HMRC (i.e. sales documents).

The mass balance shall:

- Be per site;
- Reconciliation period be a maximum of three months and in line with RTFO reporting (if applicable);
- Allow consignment identification per feedstock, origin, blend (if applicable) and carbon intensity.

The following data shall be used for the mass balance:

- Input inventory;
- Output inventory;
- Conversion factor (if applicable);
- Stock levels (if applicable).

The data used shall be accurate, consistent, and reliable in terms of source and measurement units.

### **3.5.3 Renewable Fuel GHG Emission Declarations**

Renewable Fuel Declarations shall be issued to customers as per RFAS Guidance section 2.3. The RFS shall use the Renewable Fuel Declaration templates issued by Zemo Partnership and complete the required fields.

Declarations shall cover information pertaining to volumes of the renewable fuel which has been approved under the RTFO scheme three months previous. GHG emission intensity and saving will be presented as three-month average figures. Companies are permitted to transfer over batches for RTFO verified fuel from one period to next, the mass balancing of this renewable fuel with customer sales must be completely transparent. RFAS deadlines for issuing the renewable fuel declarations are as follows:

Declaration and 6-monthly disclosure report deadlines

Month	Renewable Fuel Declaration Deadline		6-month GHG and Sustainability Disclosure	
Jan	Q1	15-Jul	Q1+Q2	15-Oct
Feb				
Mar				
Apr	Q2	15-Oct		
May				
Jun				
Jul	Q3	15-Jan (following year)	Q3+Q4	15-Apr (following year)
Aug				
Sep				
Oct	Q4	15-Apr (following year)		
Nov				
Dec				

Declaration Recall Process

Where renewable fuels have been delivered and/or sold with inaccurate information, the RFS shall:

- Notify the customer and Zemo Partnership within 5 business days;
- Analyse the root cause and implement corrective action;
- Implement measures to avoid reoccurrence.

The RFS shall maintain records of all sustainability declarations and recall situations. These will be subject for inspection during compliance audit.

**3.6 Logos and Claims**

**3.6.1 Product and Company Statements**

Renewable Fuel Suppliers might be interested in marketing their RFS status and renewable fuels approved under the RFAS. In order to do this, the following disclaimers can be used:

- Company 'x' is an approved Renewable Fuel Supplier under the RFAS, our reference number is XXXXX.
- Company 'x' follows the RFAS requirement to supply renewable and/or low carbon fuels. Our RFAS reference number is XXXXX.
- The 'RFAS APPROVED FUEL' supplied conforms to RFAS requirements. Our Renewable Fuel Supplier reference number is XXXXXX.
- Our 'RFAS APPROVED FUEL' is assured under RFAS. Our Renewable Fuel Supplier reference number is XXXXXX.

### **3.6.2 RFAS Logo Use**

The RFS will be issued with the RFAS logo. The following requirements shall be met:

- The RFS reference number shall be included wherever the logo is used to allow a validity verification.
  
- The following actions are not allowed:
  - Changing the proportions of the design, the content, or the colour.
  - Changing the logo orientation.
  - Combining any logos or designs in a way that implies association.

The logo can only be used by the RFS and signposted on their company website and reports such as corporate sustainability reports.

### **3.7 Complaints**

The RFS shall ensure that complaints received regarding the RFAS compliance are adequately considered, processed, and monitored, including the following:

- Acknowledge receipt of the complaint to the complainant within five (5) business days of receiving the complaint.
- Investigate the complaint and specify its proposed actions in response to the complaint within one (1) month. If more time is needed to complete the investigation, an agreement between relevant parties shall be reached.
- Take appropriate actions with respect to complaints and any weaknesses found in processes.
- Notify the complainant and Zemo Partnership when the complaint is successfully addressed and closed.

Records of complaints shall be maintained, to demonstrate that appropriate action was taken. These will be subject for inspection during compliance audits.

## **4. Governance**

Zemo Partnership is responsible for managing the day-to-day delivery of the scheme and engagement with companies approved under the scheme. Zemo Partnership is working in collaboration with an auditor to deliver all required audits associated with the RFAS for the first year of implementation.

The scheme delivery will aim to:

- Maintain integrity, transparency and robustness in the supply of renewable transport fuels.
- Ensure a homogeneous audit approach.
- Easily embed compliance requirements in common systems and processes.
- Establish a harmonised and consistent approach for RFS to report renewable fuel GHG emissions and sustainability information to their customers.

### **4.1 Record Retention**

Zemo Partnership will keep all documents and records related to RFAS scheme for at least 7 years, including but not necessarily limited to:

- Scheme Membership Application
- Complaints and appeals
- Ongoing Monitoring
- RFAS audits
- Termination documentation
- Withdrawal

Zemo Partnership will keep all information submitted by RFS as confidential, unless advance agreement is made regarding how to share and use specific information.

### **4.2 Complaints and Appeals**

Zemo Partnership will ensure that complaints and appeals received in relation to audit check results, fees, termination and withdrawals are considered, processed and monitored. The following steps will be followed:

- Acknowledge receipt of the complaint or appeal to the complainant within five (5) business days of receiving the complaint.
- Investigate the complaint and specify its proposed actions in response to the complaint within one (1) month. To cater for a situation in which an agreement cannot be reached, an agreement between relevant parties should be sought.
- Take appropriate action with respect to complaints and any weaknesses found in processes.
- Notify the complainant when the complaint is successfully addressed and closed.

### **4.3 Renewable Fuel Supplier Termination and Withdrawal**

#### Termination

The Renewable Fuel Supplier approval will be automatically terminated if any of the following scenarios arise:

- Renewable fuels sold by RFS are no longer in compliance with the RFAS. This can be due, but not limited to, failure to close corrective action requests or the fuel no longer meeting the RFAS criteria.
- Evidence of serious misuse and/or fraudulent behaviour against RFAS requirements during verification audit checks, or ongoing monitoring.
- Failure to provide the documents required for on-going monitoring.

Zemo Partnership will update their records to show 'termination date DD/MM/YYYY'. The RFS will remove all logos and RFAS references from all marketing material within 7 days of the date of the signed withdrawal letter from Zemo Partnership. The RFS's termination date will be shown on Zemo Partnership website for a period of six months.

#### Withdrawal

In the event a Renewable Fuel Supplier does not intend to continue being approved under RFAS, written notification shall be sent to Zemo Partnership. The withdrawal will be processed within 10 days. Zemo Partnership will update their records to show the RFS has withdrawn its participation in the scheme 'withdrawn date DD/MM/YYYY'. The RFS will remove all logos and RFAS references from all marketing material within 30 days of the date of a signed confirmation of withdrawal letter from Zemo Partnership. The RFS's withdrawal date will be presented on Zemo's website for a period of six months.

### **4.4 Public Information - Website**

Zemo Partnership will make the following information publicly available on their website:

- Renewable Fuel Supplier company name and renewable fuel blend(s) sold;
- Renewable Fuel Supplier reference number and approval date.

### **4.5 RFAS Application and Participation Fees**

The RFAS requires companies to pay an application fee and annual participation fees to maintain on-going approval under the scheme. This includes the auditor compliance checks.

## **5. Responsibilities and Competencies**

### **5.1 Zemo Partnership**

- Processing RFS application approval.
- Processing RFS termination and withdrawal.
- Liaising with relevant stakeholders to harmonise the approach with RFAS.
- Remaining up to date with legislation and applicable standards.
- Providing and/or engaging with technical support when required.
- Processing complaints and appeals as per RFAS Technical Guidance section 4.2.
- Undertaking application and compliance audits (for the first year only).
- Managing public information shared in website.
- Appointing audit providers.
- Ongoing monitoring, which includes 6 monthly checks and compliance audit checks.

### **5.2 Renewable Fuel Supplier**

- Making its application to the scheme.
- Engaging with the audit provider.
- Ensuring on-going compliance with RFS performance standards.
- Informing Zemo Partnership about any changes affecting their status, such as contact personnel, company name, change in operations or similar.
- Ensuring 'Compliance audit checks' and six-month reporting are conducted within the timeframes.
- Determining corrective actions and sending evidence to the auditor for nonconformity closure.
- Reporting to Zemo Partnership any complaints received related to the compliance and performance within the scope of the scheme operations.

### **5.3 Approved Audit Provider**

- Conducting application and compliance audits.
- Providing opportunities for improvement.
- Raising nonconformities when RFAS requirements are not met.
- Reviewing corrective actions and related evidence for nonconformities closure within 40 days of issuance.
- Reporting to Zemo Partnership any complaints or concerns relating to the scheme, that could compromise the reputation of the RFAS and/or Zemo Partnership.

#### **Audit Provider Competencies**

- Knowledge and skills regarding the RTFO, including GHG calculations, mass balance and chain of custody requirements.
- Knowledge and audit skills (Lead Auditor Certificate).
- Experience in conducting audits following assurance engagement standard (ISAE 3000, AA1000).
- Audit experience for bespoke schemes and standards in line with RFAS.



## Appendix A: Renewable Fuel Supplier Approval Document



### **Renewable Fuel Supplier Approval**

Company x, registered address x, has been approved as a Renewable Fuel Supplier.  
Renewable Fuel Supplier reference number x.

The following renewable fuel is covered under the scheme:

**Compressed Biomethane at a blend of 100%.**

Approval Period: 1<sup>st</sup> March 2022 - 2022

Zemo Partnership- signature

Date of Approval: x 2022

## Appendix B: Renewable Fuel Declaration, Example 1 Liquid or Gaseous Biofuels



### Renewable Fuel Declaration



Fleet Operator & Supplier Information			
Customer name	Zemo Logistics	Customer address	An Industrial Estate, AB12 3DE
Renewable fuel supplier	Fuel Supplies Ltd	Renewable fuel supplier identifier	XY/Z1/22
Category of renewable fuel supplier	Trader	Declaration period	3 months - Jan to Mar 2022
Declaration number	XY/01/Jan-Mar22	Date declaration issued	11 <sup>th</sup> April 2022

Renewable Fuel Description	
Renewable fuel	HVO
Renewable fuel blend supplied	100%
Volume of renewable fuel sold	10,000 litres
Production process	Hydrogenation and isomerization
Country of production	Netherlands
Distribution to refuelling station	Road tanker using biodiesel

Greenhouse Gas Emissions Performance	
GHG emissions intensity of renewable fuel supply chain	7 gCO <sub>2</sub> e/MJ
GHG emissions savings	93%

Feedstock Sustainability	
Renewable fuel feedstocks	Used cooking oil
Country(s) of origin	China, Singapore
Traceability from feedstock origin	Feedstock physically maintained through the supply chain
Supply chain voluntary sustainability scheme certification(s)	Yes - ISCC

**GHG Emissions Savings Compared To Fossil Fuel**

GHG savings %

A+	101+	
A	91-100	A 93%
B	81-90	
C	71-80	
D	61-70	
E	51-60	
F	41-50	
G	31-40	
H	21-30	
I	11-20	
J	0-10	Fossil and pump diesel

Further Information	
GHG emissions relate to Scope 3 emissions in corporate GHG emissions reporting (Greenhouse Gas Protocol). GHG emissions savings of more than 100% means that the renewable fuel is carbon negative.	
Renewable fuel supplier has corporate GHG emissions reduction plan - Yes	
Zemo Partnership approval: <i>G. Zepite</i>	
RFAS period:	2022-2023
RFAS website: <a href="http://www.zemo.org.uk">www.zemo.org.uk</a>	

## Appendix B: Renewable Fuel Declaration, Example 2 Renewable Hydrogen



### Renewable Fuel Declaration



Fleet Operator & Supplier Information			
Customer name	Zemo Logistics	Customer address	An Industrial Estate, AB12 3DE
Renewable fuel supplier	Fuel Supplies Ltd	Renewable fuel supplier identifier	XY/ZI/22
Category of renewable fuel supplier	Trader	Declaration period	3 months - Jan to Mar 2022
Declaration number	XY/01/Jan-Mar22	Date declaration issued	11 <sup>th</sup> April 2022

Renewable Fuel Description		Greenhouse Gas Emissions Performance	
Renewable fuel	Hydrogen	GHG emissions intensity of renewable fuel supply chain	6 gCO <sub>2</sub> e/MJ
Renewable fuel blend supplied	100%	GHG emissions savings	94%
Volume of renewable fuel sold	10,000 kg		
Production process	Electrolysis		
Depot based or centralised production	Centralised production		
Country of production	UK		
Distribution to refuelling station	HGV tube trailer - compressed		
Dispensing	350bar compressed gas		

Feedstock Sustainability	
Renewable fuel feedstocks	Renewable electricity
Method of renewable electricity generation	Wind turbines
Country(s) of origin	UK
Supplier certified under international H2 certification scheme	No

#### GHG Emissions Savings Compared To Fossil Fuel

GHG savings %

A+	101+	
A	91-100	A 94%
B	81-90	
C	71-80	
D	61-70	
E	51-60	
F	41-50	
G	31-40	
H	21-30	
I	11-20	
J	0-10	Fossil and pump diesel

Further Information	
GHG emissions relate to Scope 3 emissions in corporate GHG emissions reporting (Greenhouse Gas Protocol). GHG emissions savings of more than 100% means that the renewable fuel is carbon negative.	
<b>Renewable fuel supplier has corporate GHG emissions reduction plan - Yes</b>	
Zemo Partnership approval: <i>G. aponte</i>	RFAS website: <a href="http://www.zemo.org.uk">www.zemo.org.uk</a>
RFAS period:	2022-2023

## Appendix C: GHG and Sustainability Disclosure

The RFS shall submit the following information per renewable fuel approved under RFAS to Zemo Partnership on a six-monthly basis.



Greenhouse Gas and Sustainability Disclosure Report			
Renewable fuel supplier name			
Renewable fuel supplier identifier			
Company contact name			
Company contact email			
Date of submission			
Declaration reporting period			
Renewable fuel types and blends sold			
Volumes of each renewable fuel type and blend sold or dispensed			
Volume units (litres or kg)			
Proportion of each renewable fuel blend going to road vehicle fleet			
Proportion of each renewable fuel blend going to NRMM			
Proportion of each renewable fuel blend going to distributors / other			
Units for proportion of fuel to road / NRMM / other (litres, kg or %)			
Average GHG emission intensity for each renewable fuel blend (gCO <sub>2</sub> e/MJ)			
Average GHG emission savings* for each renewable fuel blend (%)			
Renewable fuel feedstocks			
Number of customers receiving different renewable fuel blends			
List (or provide the range for) the renewable fuels declaration unique reference numbers raised over the last 6 months (e.g. REF/001-REF/010)			
<p><i>Note: this report should be emailed to Zemo Partnership (Gloria.esposito@zemo.org.uk) every six months.</i></p> <p><i>Data for Q1 and Q2 (combined or separate) is due by 15th October of the same calendar year.</i></p> <p><i>Data for Q3 and Q4 (combined or separate) is due by 15th April of the following calendar year.</i></p>			

\* based on Fossil Fuel Comparator of 94 gCO<sub>2</sub>e/MJ

## Appendix D: Fuel Lifecycle Greenhouse Gas Emission Calculations

The following GHG emission values are required for the RFAS:

- Renewable fuel: GHG emission intensity (gCO<sub>2</sub>e/MJ) and GHG emissions savings (%).
- Renewable fuel blends: GHG emission intensity (gCO<sub>2</sub>e/MJ) and GHG savings (%).

This can entail using a default value for the renewable fuel or calculating the fuel lifecycle GHG emission applying actual values. The following fuel lifecycle parameters shall be used and calculated in accordance with D1 – D4. These are based on the RTFO Guidance 2, therefore refer to the guidance for further details.

Table D1: Fuel Supply Chain Parameters for Calculating Total GHG Emissions (E)

Eec	Extraction or cultivation of raw materials.
EI	Annualized over 20 years GHG emissions from carbon stock change due to land use change.
EP	Renewable fuel production process.
Etd	Transport and distribution - includes downstream emissions for distribution up to and including the filling station. Compression or liquefaction of gaseous fuels and distribution by road tanker, marine vessel or distribution through dedicated pipeline (including UK and European gas grid in the case of biomethane).
Eu	Fuel in use (CO <sub>2</sub> treat as zero).
Esca	Savings from soil carbon accumulation via improved agricultural management.
Eccr	Savings from carbon capture and replacement.
Eccs	Savings from carbon capture and geological storage, this shall take into account GHG emissions associated with abatement technology and transport and distribution of CO <sub>2</sub> to storage.
Eee	Savings from excess electricity from cogeneration. Emissions from the manufacture of machinery and equipment shall not be taken into account.
Efh	Fugitive hydrogen emissions specifically related to hydrogen losses in RFNBO supply chains.

### Calculating GHG emission intensity of renewable fuel

#### D.1 Biofuels

GHG emission intensity calculation:  $E = Eec + EI + EP + Etd + Eu + Esca - Eccs - Eccr - Eee$

#### D.2 RFNBO Fuels

GHG emission intensity calculation:  $E = Eec + EP + Etd + Eu - Eccs - Eee + Efh$

#### D.3 Default & Disaggregated GHG values

The RTFO Guidance 2 allows for use of default and disaggregated default values as long as these are available for the renewable fuels, feedstock and specific processes. Please, refer to the guidance for further details. However, when these figures are not available, actual calculations will be required.

- Any direct land-use change must be taken into account and the additional emissions added to the default value.
- Any fossil fuel not listed in this appendix, will need a LCA for savings calculation purposes.
- There are no default factors under RED and RTFO for liquified biomethane, only compressed. Therefore, a separate calculation shall be performed for bio-LNG. A GHG intensity value for

liquefaction and road tanker distribution to a refuelling station will need to be determined, with the fuel life cycle calculation evidenced. This shall be added to the GHG intensity for CBG, taking into account AD plant operation, grid injection and any grid fugitive losses, in cases where biomethane is mass balanced through the gas grid.

### Calculating GHG emission intensity of renewable fuel blends

GHG emission intensity calculation:

$$E = \left( E_{FF} \times \frac{Q_{FF}}{Q_{Fuel}} \right) + \left( E_{RW} \times \frac{Q_{RW}}{Q_{Fuel}} \right)$$

- $E_{FF}$ : GHG emissions intensity from fossil fuel used. See Table D2
- $Q_{FF}$ : Fossil fuel quantity
- $Q_{FUEL}$ : Total renewable fuel quantity
- $E_{RW}$ : GHG emissions from renewable fuel used
- $Q_{RW}$ : Renewable fuel quantity

Table D2: Fuel Supply Chain Parameters for Calculating Total GHG Emissions (E) in Net CV

Fossil Fuel	Carbon Intensity (gCO <sub>2</sub> e/MJ)
CNG <sup>3</sup>	68.42
LNG <sup>3</sup>	76.35
Diesel (B7 pump diesel) <sup>3</sup>	86.87
Petrol (E10 pump petrol) <sup>3</sup>	86.11
Gas-To-Liquid (Synthetic Diesel) <sup>4</sup>	94.0

In relation to fossil synthetic fuels not listed, the source of the fuel lifecycle carbon intensity shall be identified. Evidence shall be provided of the final GHG emission savings for different GTL and renewable fuel blends following the same calculation.

### Calculating GHG emission savings

$$\text{GHG savings} = \frac{(FFC_{CI} - F_{CI})}{(FFC_{CI})} \times 100$$

- $FFC_{CI}$ : Fossil Fuel Comparator carbon Intensity (94 gCO<sub>2</sub>e/MJ)
- $F_{CI}$ : Carbon Intensity for fuel to be reported under RFAS (as a blend or as 100% renewable)

<sup>3</sup> BEIS (2021) UK Government GHG Conversion Factors for Company GHG conversion factors (Scope 1+ Scope 3)

<sup>4</sup> JEC (2020) Well To Tank Pathways

## Appendix E: RFAS compliance requirements for renewable hydrogen supply chains (RFNBOs)

### Chain of custody and mass balance

Requirements as set out in '3. RFAS Performance Standard – Compliance Requirements' within the RFAS Guidance documents must be followed in addition to the following sector specific requirements:

E.1 System procedures shall specify the production technique, process flow, hydrogen purity and production energy sources.

E.2 Feedstock categorisation shall be aligned with the RTFO 'List of feedstocks including wastes and residues'.

E.3 Hydrogen shall meet the following criteria for under RFAS:

- a. Produced using electricity and/or heat and/or cooling from wind, solar, aerothermal, geothermal or water (including hydrothermal sources, waves and tides).
- b. Not be derived from biomass, landfill gas, sewage treatment plant gas or biogases.
- c. If produced from CO<sub>2</sub>, the carbon dioxide must not be deliberately produced for the purpose of producing a RFNBO. Instead, this shall come from waste fossil sources, from biological or from atmospheric or naturally-occurring/geothermal sources.
- d. Guarantees of origin (GoO) may be used to provide evidence that a given share or quantity of energy required to produce hydrogen was generated from renewable sources. In this scenario, Guarantees of Origin and the production unit can be connected through the national electricity grid. A Power Purchase Agreement between the renewable electricity producer and the hydrogen producer shall be in place.

E.4 In the case of RFNBOs without any feedstock energy, the process energy type shall be given, e.g. solar electricity.

E.5 For part RFNBO, part non-RFNBO:

- a. Renewability methodology at production plant level shall be included in the application form and approved by Zemo;
- b. The same GHG intensity is applied to both the RNFBO and non-RFNBO parts of the fuel;
- c. The GHG emission intensity shall be calculated for the RFNBO (renewable) and non-RFNBO (fossil) fractions;
- d. Only the RFNBO fraction shall be claimed as renewable;
- e. Quantities shall be monitored and supporting evidence maintained.

E.6 Mass balance requirements must:

- a. Follow clause '3.5.2 Mass balance' within the RFAS Guidance and shall incorporate purity information and supporting evidence shall be provided (e.g. production reports, analysis);
- b. The mass balancing period shall not exceed three months;
- c. Electricity and GoOs shall be allocated equally to the overall production within the plant and all byproducts;
- d. Renewable Fuel Credits can be transferred into the next mass balance period if the equivalent amount of material is physically available. Transferring credits between materials is only allowed for one mass period and for products with similar physical characteristics;

- e. GoO must be obtained aligning with the mass balance period. A maximum of one rolled over is allowed;
- f. Renewable hydrogen approved under the RFAS must not be double counted through any other hydrogen certification scheme (e.g. EU CERTIFHY) the producer and/or supplier is associated with. Hydrogen certificates for batches of RFAS approved hydrogen must not be traded and should be cancelled. Evidence of cancelled hydrogen certification will be checked in the audit.

E.7 Hydrogen Distribution:

- a. Hydrogen can be mixed in the transmission and distribution infrastructure (e.g. pipeline), provided that the infrastructure is interconnected. This means the same infrastructure can be used for renewable hydrogen and non-renewable hydrogen. However, the quantity and quality of the hydrogen fed into and taken out of the distribution infrastructure shall be monitored and shall be verifiable. At the end of the respective mass balancing period, the quantity of hydrogen taken out of distribution infrastructure shall not exceed the quantity of hydrogen fed into it;
- b. Documents issued by the respective distribution infrastructure authority providing evidence that the quantities have been monitored and verified must be made available to the auditor.

**Calculating hydrogen supply chain GHG emissions**

The formulae below shall be used to determine the greenhouse gas emission performance of the hydrogen supply chain; each element of the production pathway being associated with a carbon intensity (gCO<sub>2e</sub>/MJ). The full calculation shall be provided by renewable fuel supplier.

GHG emission intensity = production + storage + distribution + dispensing at refuelling station + fugitive H<sub>2</sub> emissions.

$$(E = E_{ec} + EP + E_{td} + E_u - E_{ccs} - E_{ee} + E_{fh})$$

Table E1: Elements of hydrogen life cycle GHG emission calculation

Production	Relates to plant used to produce hydrogen (i.e. electrolyser) and purification.
Storage - compression /liquefaction	Hydrogen requires compression or liquefaction for bulk transport, this can be at various pressures. The total volume that can be stored compressed and transported on a tube trailer will vary from 350–1000 kg. For liquid hydrogen this rises to 3500kg.
Distribution	Entails transporting compressed or liquified hydrogen from point of production to the end customers. Typically undertaken using truck tube trailer. There may be situations when hydrogen is supplied from outside of the UK, arriving by ferry or ship, either as compressed or liquefied hydrogen. Compressed hydrogen can also be distributed by pipeline. Distance and volume of hydrogen transported is required, assuming return journey for road and sea transportation.
Dispensing at the refuelling station (350 bar)	This entails compression and cooling. Hydrogen can also be stored as liquid hydrogen, with compressed gas dispensing.
Fugitive H <sub>2</sub> emissions	Hydrogen losses can arise across the supply chain, a default factor of 1.4 gCO <sub>2e</sub> /MJ shall be used for fugitive H <sub>2</sub> emissions. A GWP of 5.8 is applied to hydrogen.



Hydrogen production, storage, distribution and dispensing have an energy requirement (kwh/kg H<sub>2</sub>) and an associated GHG emission intensity. Energy consumption data should be provided alongside GHG emissions data sets. All values shall be associated with the lower heating value for hydrogen.

GHG emission factors for energy use and feedstocks

Zemo has defined various emission factors which should be adopted for calculating GHG emission associated with grid electricity, diesel, natural gas and biomethane – Table E2.

If hydrogen is produced outside of the UK, any use of grid electricity for the production plant, and compression or liquefaction units, shall adopt the electric grid GHG emission factor of the country where this takes place. The grid electricity factor chosen, and its source, shall be disclosed. Any other source of primary energy shall be identified, with associated GHG emission factors stated, for example compression or liquefaction equipment.

Table E2: Recommended GHG emission factors

Grid Electricity	BEIS GHG Conversion Factors for Company Carbon Reporting 2021: generation and consumption, including WTT (primary fuel production emissions) and transmission and distribution losses – Scope 2 and 3 for UK production only.
Natural Gas /Biomethane	BEIS GHG Conversion Factors for Company Carbon Reporting 2021: Scope 1 (combustion emissions) and Scope 3 (fuel production emissions) for UK production only
Diesel	BEIS GHG Conversion Factors for Company Carbon Reporting 2021: Scope 1 (combustion emissions) and Scope 3 (fuel production emissions)
Renewable Electricity	Assumed to have a carbon intensity of zero.
Nuclear electricity	3.8 gCO <sub>2e</sub> /MJ (JEC 2020 Well-To-Tank Report v5)

Additional assumptions and data sources:

- Fuel economy value for a diesel HGV trailer (44t) transporting hydrogen is: 33 L/100km.
- Ferry transportation: BEIS Company Carbon Reporting (2021) for freighting goods by RoRo Ferry, Scope 3 emissions

Hydrogen as a by-product – allocation of production (EP) energy and GHG emissions

Low carbon hydrogen can be produced as a by-product from certain industrial processes such as chlor-alkali when using renewable electricity. RFAS will only approve industrial plants which derive a proportion, or all, of the electrolyser primary energy from renewable power. The carbon intensity must be calculated using the total energy consumption for the electrolyser – this may involve a combination of grid electricity and renewable electricity. The fraction of renewable electricity used to power the electrolyser shall be identified and distributed to all products produced equally.

The electrolyser energy demand, and GHG emissions, associated with the hydrogen by-product can be accounted for through an allocation procedure. This takes into consideration the environmental burden across all the end products. There are various approaches including mass (weighed average), economic, molecular and system expansion allocation methods. The renewable fuel supplier can choose an approach and provide calculations to demonstrate how the electrolyser energy use, and GHG emissions, have been allocated to each product. The calculation of GHG emissions shall account for the primary energy sources of the plant’s electrolyser. The allocation

method chosen cannot be changed, it must remain consistent throughout RFAS approval. The carbon intensity of electrolyser using both renewable and grey hydrogen shall be supplied in cases with mixed primary energy sources, the associated energy demand for the plant shall also be provided.

## Appendix F: Definitions

Batch: Specific amount of material with the same sustainability characteristics within a mass balance period.

Feedstock: Raw material used to produce renewable fuel. Approved feedstocks under this scheme are aligned with the RTFO.

Mass balance: Monitoring system to ensure renewable fuel quantities are controlled. Please refer to RTFO Guidance 2 Section 8 for a detailed explanation.

Organisation: The person or legal entity applying for compliance with RFAS.

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, advanced fuels and renewable fuels from non-biological origin (RFNBOs).

Renewable fuels of non-biological origin (RFNBOs): A type of renewable fuel where all the energy of the fuel comes from the input process energy (with no feedstock energy), and all of 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.

Renewable Transport Fuel Obligation (RTFO): Government's low carbon fuel policy for reducing greenhouse gas (GHG) emissions from road transport.

Renewable Transport Fuel Certificates (RTFC): Obligated fuel suppliers under the RTFO are required to redeem a number of RTFCs in proportion to the volume of fossil fuel and unsustainable renewable fuels they supply. RTFCs may be earned by any company supplying sustainable renewable fuels. They may also be bought or sold on an open market.

Site: one geographical location with precise boundaries within which products can be mixed.

Supplier: An individual, company or other legal entity providing feedstocks or low carbon fuels to an organisation.

Renewable Supplier Identifier: This is a unique reference number linked to one operator, traceable to a validity status under a certification or a scheme.