



ENVIRONMENTAL PRODUCT DECLARATION (EPD)

Standards, Scope & Verification

Verifier	<i>EnviroSense</i>
Reference standard	EN 15804 and ISO 14025
Sector	Liquid fuels
Category of EPD	Third-party verified EPD
Scope of the EPD	Cradle to the gate (A1-A3)
EPD author	EnviroSense International Ltd
EPD verification	Independent verification of this EPD and data, according to ISO 14025

General Information

This EPD is based on data audited and verified onsite at the production facility using measurements from meters, sourcing, and production records. It was generated based on ISO 14025 and EN 15804.

Product Description

Name	B100
Product Type	Biofuel
Raw Materials	Used Cooking Oil (UCO)
Certification	ISCC EU
RED II Compliant	Yes
Product Origin	United Kingdom
Period of Generation	01 09 2023 – 30/08/2024
Expiry Date of EPD	30 08 2026

Manufacturer

Manufacturer	Syntech Biofuels
Address	Unit 9 Kingsnorth Industrial Estate, Gamma Road, Grain ME3 9ND
Contact details	hello@syntechbiofuel.com
Website	www.syntechbiofuel.com

Functional Units & Reference Flow

Unit	gCO ₂ e/litre
Fuel specification	Multiple specifications (see Appendix)
Flow rate	See Appendix

Raw Materials

Material type	Waste
Raw materials	Used Cooking Oil (UCO)
Origins	United Kingdom

Product Life Cycle

System Boundary

The system boundary is the Cradle to the Gate as Table 1.

Table 1.

Code	Stage	Description
A1	Product stage	Raw materials
A2	Product stage	Transport
A3	Product stage	Manufacturing
A4	Product stage	Transport
A5	Product stage	Assembly
B1	Assembly stage	Use
B2	Assembly stage	Maintenance
B3	Assembly stage	Repair
B4	Assembly stage	Replacement
B5	Assembly stage	Refurbishment
B6	Assembly stage	Operational energy use
B7	Assembly stage	Operational water use

Manufacturing and Storage (A1-A3)

The biofuel is generated using grid electricity in the UK. The manufacturer also generates electricity as accredited under Ofgem for the Renewables Obligation Order. The energy consumption value is not the net value of import minus export as this exported energy is under a separate metering system.

Processing emissions include additives for fuel, such as methanol and potassium hydroxide.

Transport and Use (B1-B7)

Diesel is used for internal non-road transport for transport materials around site and ready for collection.

Life Cycle Assessment (LCA) & Methodology

LCA Approach

The study was based on ISO 14025 and EN 15804 and considered all the raw materials used to convert cooking oil into biofuel and energy consumption. This means all the inputs and outputs of the conversion of cooking oil waste, considered a waste at the point of generation to be discarded, the transport to the manufacturing site, chemicals used in manufacturing processes, process efficiency, energy consumption and the outputs: the production of waste outputs (glycerol) and biofuel to the point of collection – Syntech’s gate.

Energy consumption and material inputs have not been subject to a de minimis rule, so they are not neglected.

The report user should account for the transport of the fuel beyond this distance in their calculations based on the parameters in the Appendix (density) using a confirmed payload and tanker weight, size and a Lower Heating Value (LHV): ~37 MJ/kg.

Data Sources

The verifiers conducted an on-site audit on 24 January 2024 and verified that inputs from metering data were applied and records of diesel use were kept on site. No assumptions were made.

Allocations

Allocations for carbon emissions were applied to the processing and the outputs (biofuel and glycerol) based on the energetic contribution, which applies the relative gross calorific values of each output and amount produced.

Calculation Tools and Software

In this document, we used the applied ISCC and RED II calculation methodology and the Government emissions factors. No specific software was used.

Sensitivity & Uncertainty Analysis

We assessed the appropriateness, accuracy and validity of measurement and monitoring data. The sensitivity and uncertainty analysis of biofuel emissions is negligible when data is obtained from directly metered sources, as was the case. Metering provides precise, real-time measurements, reducing reliance on estimations or models prone to variability. Unlike indirect assessments, metered data minimised uncertainty by capturing actual fuel consumption and emissions rather than inferred values. The only uncertainty is within emissions factors. However, UK Government Greenhouse Gas Emissions Factors¹ for the year 2023 and 2024 were applied.

¹ [Greenhouse gas reporting: conversion factors 2022 - GOV.UK](#)

Environmental Performance Results

Table 2 shows the environmental performance of the function unit (per litre). There are no assumptions, as this data was audited and verified directly using meter readings on-site.

Table 2.

Impact Category	Result	Unit	Notes/Assumptions
Carbon intensity & Global Warming Potential (GWP)	459	gCO ₂ -eq/litre	including biogenic CO ₂
GWP	19.91	gCO ₂ -eq/MJ	Including biogenic CO ₂
Total Energy Use A1-A3 (Primary Energy Demand)	144,811	MJ	This includes diesel use onsite converted to MJ using the density and NCV as per Government conversion factors (ref. Dukes)
Water Use	65,520	Litres	Water is not used in the production process
Acidification Potential	2.0 × 10 ⁻⁵ kg SO ₂ -eq per kg fuel.	kg SO ₂ -eq.	There are no discharges to water in the production or waste disposal processes. Sulphur is present in the fuel (no more than 10mg/kg fuel)
Eutrophication Potential	0	kg PO ₄ -eq.	There are no discharges to water in the production or waste disposal processes. There are no nitrogen oxide (NO _x) and ammonia (NH ₃) emissions
Other Relevant Impacts	0		There is no Land Use Change (LUC) as the raw material is Used Cooking Oil (UCO), categorised and certified as a waste.

Impact Categories and Indicators

- **Global Warming Potential (GWP):**
Quantifies greenhouse gas emissions, expressed in CO₂-equivalents, and assesses the contribution to climate change.
- **Ozone Depletion Potential (ODP):**
Evaluates emissions that may deplete the stratospheric ozone layer.
- **Acidification Potential (AP):**
Measures the potential for emissions (e.g., SO₂, NO_x) to form acid rain, affecting soil and water quality.
- **Eutrophication Potential (EP):**
Assesses nutrient enrichment in aquatic systems (typically in terms of phosphate equivalents) that can lead to oxygen depletion and ecosystem imbalance.
- **Photochemical Ozone Creation Potential (POCP):**
Captures the formation of ground-level ozone (smog) from volatile organic compounds and NO_x emissions.
- **Human Toxicity Potential (HTP):**
Considers the potential impacts on human health from exposure to toxic substances.



- **Ecotoxicity Potential:**
Evaluates the potential effects of chemical emissions on ecosystems and biodiversity.
- **Abiotic Resource Depletion:**
Assesses the consumption of non-renewable resources such as fossil fuels and minerals, relevant when considering process energy inputs or auxiliary materials.
- **Water Use/Water Depletion:**
Quantifies the impact of water consumption during cultivation, processing, and conversion stages.
- **Land Use and Land Use Change:**
Reflects impacts related to the conversion of natural land (or its intensity of use) for biofuel feedstock production, including effects on biodiversity and ecosystem services.

Additional Environmental Information

Biofuel Savings

The biofuel saves 93% compared to the fossil fuel comparator or road transport fossil fuel (94gCO₂e/MJ).

The emissions of the fuel, produced from generating the biofuel and transporting it to a maximum distance of 100 miles by a 40t tanker fuelled by diesel, were calculated and verified in the unit of measurement gCO₂e/MJ. The end value and greenhouse gas emissions associated with the fuel prior to use and combustion is referred to as the 'carbon intensity' of the fuel. This is the value 'E' in the RED II calculation.

The carbon intensity calculation methodology is described by the ISCC Greenhouse Gas Emissions criteria (ISCC system document 205). The supply chain was also assessed against the ISCC system guidance and requirements. The RED II calculation is as follows:

$$E = E_{ec} + E_l + E_p + E_{td} + E_u - E_{sca} - E_{ccs} - E_{ccr}$$

- 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 CO₂ capture and geological storage; and E
- E_{ccr} = emission savings from CO₂ capture and replacement.

Only E_{td} + E_p applied to Syntech Biofuels as the cultivation of the harvesting or the original crops for cooking oil does not apply as it is a waste.

Certification

The biofuel is ISCC-EU certified. The certification demonstrates the fuel meets the RED II.
