moving to zero

Heavy Duty Vehicle Decarbonisation Guide: Renewable Fuels

Zemo Partnership

Accelerating Transport to Zero Emissions

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Symud i Sero | Moving to Zero

Canllaw Datgarboneiddio Cerbydau Trwm: Tanwyddau Adnewyddadwy

Cefnogi gweithredwyr fflydoedd cerbydau trwm i leihau eu hôl troed carbon a'u hallyriadau nwyon tŷ gwydr

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Heavy Duty Vehicle Decarbonisation Guide: Renewable Fuels

Helping heavy duty vehicle fleet operators lower their greenhouse gas emissions

Version 1.0

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Zemo.org.uk

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Overview of the Heavy Duty Vehicle Decarbonisation Guide: Renewable Fuels

Zemo Partnership has produced this guide to assist heavy duty vehicle (HDV) operators on their journey to net zero and understand the low carbon, renewable fuel options available today. The guide sits as part of the wider *Moving to Zero | Symud i Sero* Work Programme; an initiative between the Welsh Government and Zemo Partnership to take forward the recommendations from the previously published "Actions for Accelerating the Decarbonisation of Commercial Vehicles in Wales[1]".

Moving to Zero | Symud i Sero aims to support Welsh fleets to operate more efficiently and effectively and help Wales meet targets to reduce emissions from its commercial vehicle sector in a fair and just way. One such way is through the increased adoption of low carbon renewable fuels. Renewable fuels are sustainable alternatives to fossil fuels, as they are produced from organic and waste-based materials or feedstocks, such as food waste, manure, and used cooking oil.

This guide is written for HGV fleet operators and decision-makers in Wales. It focuses on renewable fuels that can be deployed currently in heavy duty road freight: biodiesel (FAME), renewable diesel - including hydrotreated vegetable oil (HVO), and biomethane (bio-CNG and bio-LNG). Throughout this guide, "renewable fuels" refers to the use of low carbon renewable fuels specifically. Renewable hydrogen is not included, as Zemo Partnership considers this a long-term decarbonisation pathway in its own right.

Introduction

Heavy goods vehicles (HGVs) are essential to Wales' economy and communities, enabling the movement of essential commodities including food, appliances, livestock, waste, and construction materials. However, HGVs and other heavy duty vehicles also contribute a disproportionate share of road transport greenhouse gas (GHG) emissions.

In Wales, road transport consistently emits over 5,000 $ktCO_2e$ of GHG emissions annually, amounting to nearly 15% of total domestic GHG emissions in 2023[2]. Despite representing only around 1.6% of the Welsh vehicle fleet (approximately 25,000

[1] Zemo Partnership (2025): Actions for Accelerating the Decarbonisation of Commercial Vehicles in Wales

[2] National Atmospheric Emissions Inventory (2025): Greenhouse Gas Inventories for England, Scotland, Wales & Northern Ireland: 1990-2023

vehicles)[3], heavy duty vehicles account for nearly 15% of the road vehicle parc's total GHG emissions (Figure 1).

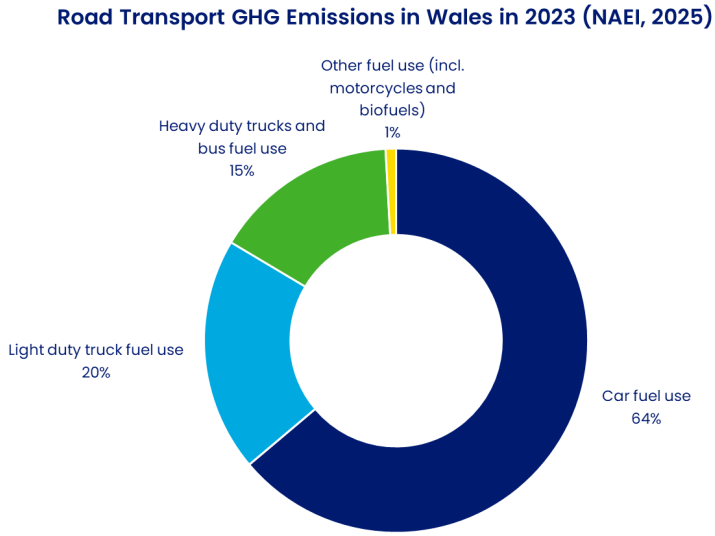


Figure 1: Road transport GHG emissions in Wales in 2023

The Welsh Government (Senedd Cymru) has implemented significant climate legislation to reduce GHG emissions, with an ambitious target to achieve net zero emissions by 2050. Interim targets for 2030 and 2040 require a 63% and 89% reduction in emissions respectively, compared with the baseline year specified within the Environment (Wales) Act 2016.

Meeting these targets will require road transport emissions to fall sharply, in the region of 73% by 2035. Achieving this means rapid reduction in fossil fuel use, alongside greater uptake of renewable fuels and zero tailpipe emission technologies. For HGVs in particular, lengthy vehicle lifetimes and enabling infrastructure mean decisions taken this decade will lock in emission outcomes well into the 2030s and 2040s. There will be no single pathway to decarbonise HGV operations; instead, a variety of solutions will be needed across different vehicle types, duty cycles, and operational requirements, to maximise sector-wide GHG savings.

The Role of Renewable Fuels

The UK Government has set end of sales dates for new, non-zero tailpipe emission HGVs: 2035 for trucks less than or equal to 26 tonnes, and 2040 for vehicles over 26 tonnes, signalling a clear direction towards zero emission freight. Complimentary government action at a UK level includes:

[3] Department for Transport (2026): Vehicle licensing statistics data tables - VEH0101a (last updated 15th January 2026)

- The Zero Emission HGV and Infrastructure Demonstrator (ZEHID) programme, to determine the real-world performance and infrastructure needs for 40-44 tonne long-haul zero emission trucks[4],
- The Plug-in Truck Grant, to help offset the high upfront purchase cost of zero tailpipe emission HGVs, with support varying by vehicle weight[5], and
- A consultation on an HGV CO_2 regulatory framework (a potential UK 'ZEV mandate')[6], to support the transition to zero emission trucks.

Despite this direction, progress remains slow amid conservative market demand. As of early 2026, zero emission HGVs account for under 0.3% of total vehicles in use in Wales[7]. The applications most suited to early electrification include back-to-base and urban operations, where routes are predictable and vehicles can return to a depot for charging.

For long-haul or high payload operations, particularly 44 tonne articulated (artic) trucks which account for a large share of HGV emissions, operators face constraints to early electrification. Upfront vehicle costs remain a market barrier, particularly for small and medium enterprises (SMEs) operating on extremely narrow profit margins.

Depot charging often requires substantial electricity network upgrades, and obtaining the required grid connection can take up to eight years to achieve. Depot ownership is not always a given, resulting in limited opportunities for private infrastructure investment and a reliance on the public charging network; where HGV-specific provisions remain sparse.

As a result, internal combustion engine (ICE) HGVs are likely to remain a significant feature of the UK-wide fleet well beyond the 2035 and 2040 end of sales dates, particularly in the hard-to-abate duty cycles. Renewable fuels provide a complementary pathway that can deliver near-to-medium term GHG savings for existing vehicles, while the zero emission vehicle (ZEV) landscape matures.

In Wales, where the HGV age is two years older than the UK average, renewable fuels can play an essential role in decarbonising the in-service fleet. Zemo Partnership has estimated that under a complementary scenario combining high renewable fuel uptake with increased ZEV adoption, well-to-wheel (WTW) GHG savings in the Welsh commercial fleet could cumulate to an additional 8,381 $ktCO_2e$ over 2024 to 2050[8]. This represents a significant opportunity to reduce GHG emissions from

[4] Innovate UK (2026): Zero Emission HGV and Infrastructure Demonstrator (ZEHID) programme
[5] Office for Zero Emission Vehicles (2026): Plug in Van and Truck Grant
[6] Department for Transport (2026): Consultation on a New Heavy Goods Vehicle CO_2 Emissions Regulatory Framework for the United Kingdom
[7] SMMT (2026): Heavy Good Vehicle (HGV) Registrations (data from Q4 2025)
[8] Zemo Partnership (2025): Actions for Accelerating the Decarbonisation of Commercial Vehicles in Wales

existing vehicles and help operators meet their own emission reduction targets through adoption of the renewable fuels featured in this guide.

Greenhouse Gas Emissions Measurement and Reporting

Disclosure of GHG emissions is increasingly a legal and commercial requirement for businesses both in the UK and internationally. In the UK, quoted companies must measure and report GHG emissions under the Companies Act (2006), and the Streamlined Energy and Carbon Reporting (SECR) regulations extend requirements to large companies and SMEs that meet certain financial thresholds. The most widely used international standard for GHG measurement is the Greenhouse Gas Protocol.

Within this framework, organisations report emissions as Scope 1 (direct emissions for which a company is directly responsible, such as a company-owned vehicle fleet), Scope 2 (indirect emissions from electricity use), and Scope 3 (indirect emissions across the supply chain, including 'upstream' fuel supply and 'downstream' distribution), as illustrated in Figure 2.

In the transport sector, emissions may also be expressed as "Tank-to-Wheel" (TTW), 'Well-to-Tank" (WTT) and "Well-to-Wheel" (WTW), which corresponds to emissions from vehicle engine combustion, the fuel supply chain, and full lifecycle emissions; from production through to in-vehicle use, respectively. For freight and logistics, the Global Logistics Emissions Council (GLEC) sets out sector-specific guidance aligned with the GHG Protocol.

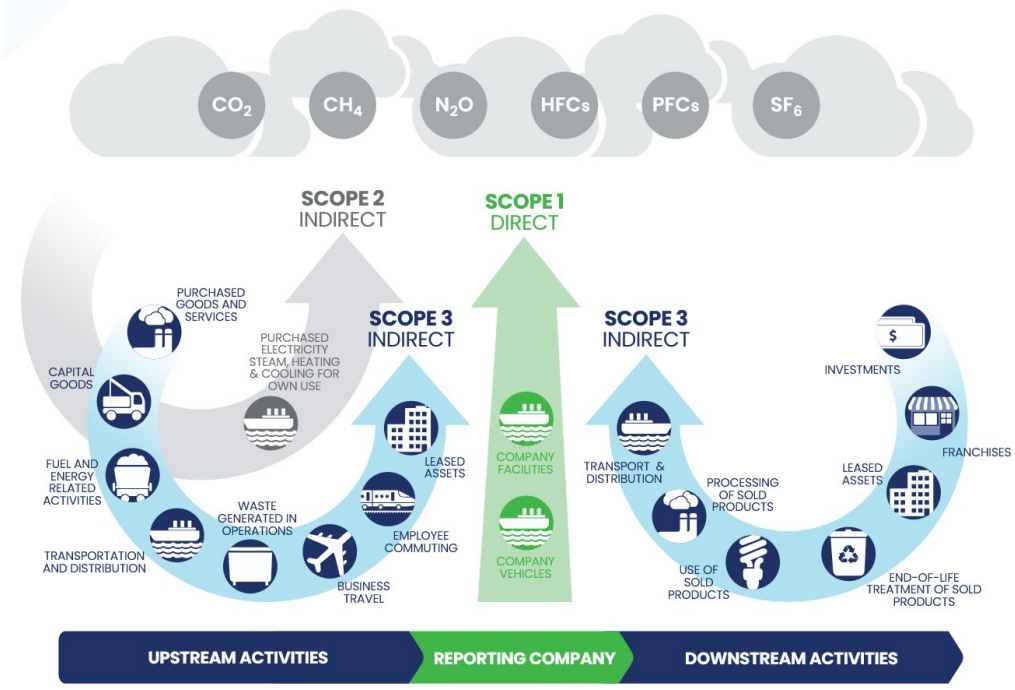


Figure 2: Corporate GHG emission measurement and reporting sources.

In Wales, the Welsh Government has set an ambition to reach net zero carbon within the public sector by 2030, whereby public bodies are required to measure and report GHG emissions, including those from company-controlled vehicles. More broadly, a growing number of organisations are disclosing emissions through Corporate Sustainability Reporting, and are setting targets under the Science Based Targets initiative (SBTi) out to 2030 and 2050.

Companies addressing emissions from their supply chain are attracting strong attention, particularly from customers and consumers that wish to align purchasing behaviours with sustainable products and services. Decarbonising transport related emissions will feature heavily in nearly every company's climate change mitigation strategy, with emissions performance being integrated into procurement policies and contract tendering. By operating an HGV on renewable fuel, fleet operators will be a step ahead of other bidders.

Supporting the Renewable Fuels Market: Ensuring Sustainable Supply Chains

The Renewable Transport Fuel Obligation (RTFO)

The main overarching policy mechanism incentivising renewable fuel supply chains across the UK is the Renewable Transport Fuel Obligation (RTFO) Order. The RTFO was established by the Department for Transport (DfT) over eighteen years ago, to deliver GHG emission reductions from fuel used in road transport and non-road mobile machinery (NRMM).

Under the RTFO, a set proportion of fuel supplied to the UK road and NRMM markets must be comprised of renewable fuel; the percentage of which is set to rise year-on-year, ultimately reaching 14.6% by 2032. Renewable fuel must meet set sustainability criteria to be eligible, whereby:

- Renewable fuels must achieve more than 65% lifecycle GHG emissions savings, compared to equivalent fossil fuels,
- Renewable fuel production must not result in land use change that causes deforestation, loss of biodiversity, or removal of high value carbon vegetation, and
- Feedstocks must originate from genuine biomass wastes and residues.

Supply chains are confirmed to be sustainable through independent verification, and many renewable fuel suppliers' evidence compliance achieved via voluntary sustainability scheme certification. One of the most widely adopted schemes is the International Sustainability and Carbon Certification (ISCC).

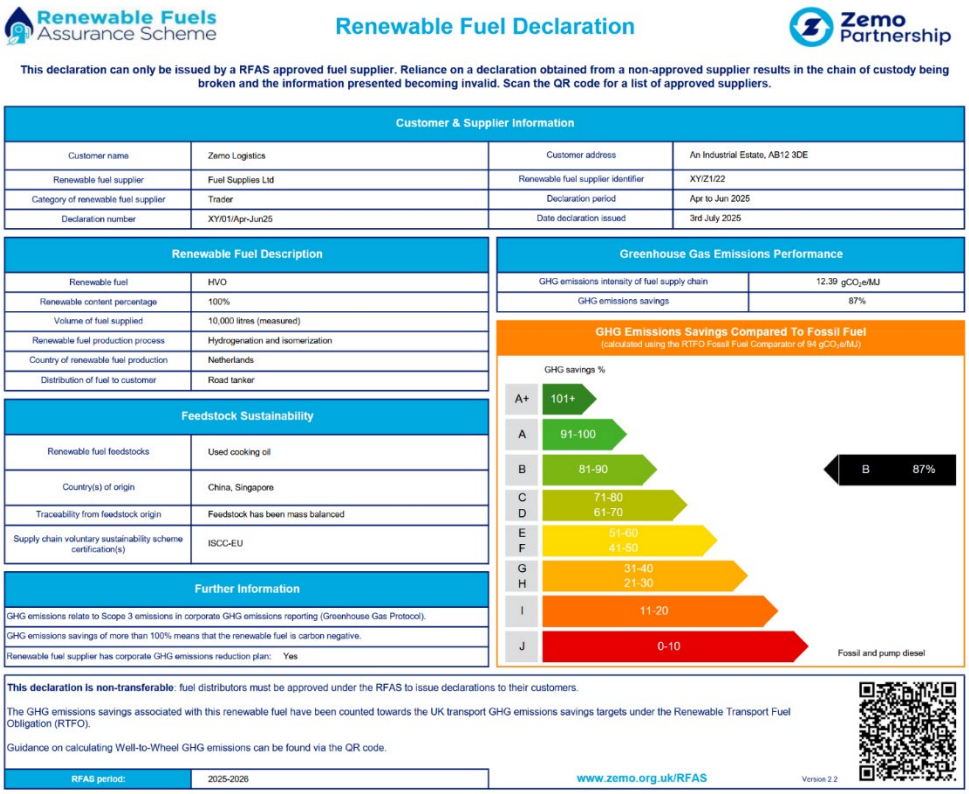
Complementing the RTFO, Zemo Partnership's Renewable Fuel Assurance Scheme (RFAS) is a voluntary initiative that delivers robust, independent assurance of the GHG savings and feedstock sustainability claims made by renewable fuel suppliers in the UK and Europe. The scheme is open to stakeholders across the renewable fuel supply chain, including producers, traders, and distributors.

The scheme is underpinned by strict standards for lifecycle GHG performance, feedstock sustainability, and supply chain traceability, helping to strengthen consumer confidence and improve transparency for renewable fuels supplied to the commercial fleet and NRMM sectors.

Renewable fuel suppliers are approved by Zemo Partnership following a successful, independent audit; verifying compliance with the RFAS performance standards. Once approved, suppliers are required to provide their customers with a *Renewable Fuel Declaration* (RFD) for batches of renewable fuel sold (Figure 4) This document identifies important sustainability information about the renewable fuel supplied to end customers, including:

- Lifecycle GHG emission savings and intensity
- Types of biomass feedstocks used to produce the renewable fuel

Each RFD has a unique ID and identifies the customer's RFAS approved fuel supplier. Only companies approved under RFAS are permitted to issue Declarations to their customers.



Renewable Fuels Assurance Scheme

Renewable Fuel Declaration

Zemo Partnership

This declaration can only be issued by a RFAS approved fuel supplier. Reliance on a declaration obtained from a non-approved supplier results in the chain of custody being broken and the information presented becoming invalid. Scan the QR code for a list of approved suppliers.

Customer & 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	Apr to Jun 2025
Declaration number	XY/01/Apr-Jun25	Date declaration issued	3rd July 2025

Renewable Fuel Description

Renewable fuel	HVO
Renewable content percentage	100%
Volume of fuel supplied	10,000 litres (measured)
Renewable fuel production process	Hydrogenation and isomerization
Country of renewable fuel production	Netherlands
Distribution of fuel to customer	Road tanker

Feedstock Sustainability

Renewable fuel feedstocks	Used cooking oil
Country(s) of origin	China, Singapore
Traceability from feedstock origin	Feedstock has been mass balanced
Supply chain voluntary sustainability scheme certification(s)	ISCC-EU

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

Greenhouse Gas Emissions Performance

GHG emissions intensity of fuel supply chain	12.39 gCO_2e/MJ
GHG emissions savings	87%

GHG Emissions Savings Compared To Fossil Fuel

(calculated using the RTFO Fossil Fuel Comparator of 94 gCO_2e/MJ)

GHG savings %

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

B 87%

Fossil and pump diesel

This declaration is non-transferable: fuel distributors must be approved under the RFAS to issue declarations to their customers.

The GHG emissions savings associated with this renewable fuel have been counted towards the UK transport GHG emissions savings targets under the Renewable Transport Fuel Obligation (RTFO).

Guidance on calculating Well-to-Wheel GHG emissions can be found via the QR code.

RFAS period: 2025-2026

www.zemo.org.uk/RFAS

Version 2.2

Figure 3: Example of an RFAS Renewable Fuel Declaration

RFAS enables fleet operators to obtain supply chain specific GHG emissions data from their fuel suppliers, supporting more representative information for corporate carbon measurement and reporting. As scrutiny of product supply chains increases, RFAS also gives procurement and fleet management teams greater confidence in the sustainability credentials of renewable fuels. As a result, a growing number of organisations now require contractors to use renewable fuels and specify RFAS-approved suppliers within tendering processes.

As of Q2 2026, fifty-nine companies are approved under the RFAS, supplying biodiesel blends, renewable diesel, compressed and liquified biomethane, and renewable hydrogen.

Renewable Fuels Assurance Scheme Fleet

RFAS Fleet enables commercial vehicle operators using renewable fuels to demonstrate independently verified GHG emissions reductions to their customers. It converts investment in low carbon transport into auditable evidence that can support Scope 3 reporting, Environmental, Social and Governance (ESG) disclosures,

procurement requirements and customer assurance. The scheme provides operators with carbon insetting solutions; facilitating the decarbonisation of company-specific supply chains as aligned with the GHG Protocol and SBTi. Gregory Distribution is the first logistics company to be approved under RFAS Fleet.

The core objectives of the scheme are to:

- independently verify renewable fuel traceability across a fleet operator's customer base;
- verify WTW GHG emissions reductions associated with transport activity;
- establish a harmonised approach to reporting WTW GHG emissions and renewable fuel supply chain information;
- verify the allocation of renewable fuel GHG savings to customer journeys;
- reduce the risk of double counting or unsupported emissions claims.

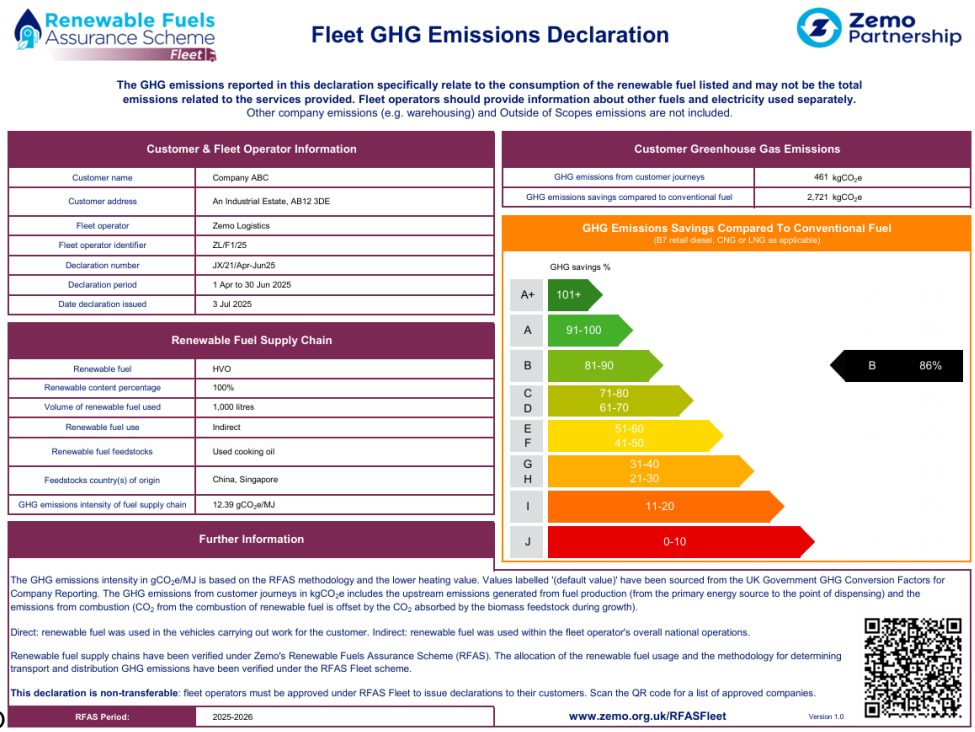
Only fleet operators procuring RFAS-approved sustainable fuels are suitable for the scheme. Once approved, fleet operators can issue customer-facing 'Fleet GHG Emission Declarations', Companies are audited annually to ensure continued compliance with RFAS Fleet requirements.

The Fleet GHG Emissions Declarations provide a harmonised approach to conveying important sustainability information for the renewable fuel used in the delivery of goods or services. It includes information on the types and volumes of renewable fuel used, sustainable feedstock data, and GHG emissions and savings for the customer's journey.

In long-haul distribution, renewable fuel logistics can be operationally difficult. A fleet may have access to renewable fuel at a dedicated depot but rely on standard diesel infrastructure for regional or long-haul routes. RFAS Fleet solves this through a robust allocation methodology underpinned by recognised chain-of-custody principles. Renewable fuel can be allocated 'virtually', detaching the sustainability credentials from the physical fuel, to accurately allocate these to customer journeys completed using diesel vehicles. The sustainability credentials are always linked to physical renewable fuel transactions, enhancing traceability of the fuel used.

This allows operators who serve multiple customers to allocate carbon reductions from one area of operation to another, enabling them to provide sustainable solutions indirectly by operating renewable fuels on other routes. This flexibility

allows operators to decarbonise operations in areas where physical access to renewable fuel is limited.



Renewable Fuels Assurance Scheme Fleet

Fleet GHG Emissions Declaration

Zemo Partnership

The GHG emissions reported in this declaration specifically relate to the consumption of the renewable fuel listed and may not be the total emissions related to the services provided. Fleet operators should provide information about other fuels and electricity used separately.
Other company emissions (e.g. warehousing) and Outside of Scopes emissions are not included.

Customer & Fleet Operator Information

Customer name	Company ABC
Customer address	An Industrial Estate, AB12 3DE
Fleet operator	Zemo Logistics
Fleet operator identifier	ZL/F1/25
Declaration number	JX/21/Apr-Jun25
Declaration period	1 Apr to 30 Jun 2025
Date declaration issued	3 Jul 2025

Renewable Fuel Supply Chain

Renewable fuel	HVO
Renewable content percentage	100%
Volume of renewable fuel used	1,000 litres
Renewable fuel use	Indirect
Renewable fuel feedstocks	Used cooking oil
Feedstocks country(s) of origin	China, Singapore
GHG emissions intensity of fuel supply chain	12.39 gCO_2e/MJ

Customer Greenhouse Gas Emissions

GHG emissions from customer journeys	461 $kgCO_2e$
GHG emissions savings compared to conventional fuel	2,721 $kgCO_2e$

GHG Emissions Savings Compared To Conventional Fuel
(B7 retail diesel, CNG or LNG as applicable)

Further Information

The GHG emissions intensity in gCO_2e/MJ is based on the RFAS methodology and the lower heating value. Values labelled '(default value)' have been sourced from the UK Government GHG Conversion Factors for Company Reporting. The GHG emissions from customer journeys in $kgCO_2e$ includes the upstream emissions generated from fuel production (from the primary energy source to the point of dispensing) and the emissions from combustion (CO_2 from the combustion of renewable fuel is offset by the CO_2 absorbed by the biomass feedstock during growth).

Direct: renewable fuel was used in the vehicles carrying out work for the customer. Indirect: renewable fuel was used within the fleet operator's overall national operations.

Renewable fuel supply chains have been verified under Zemo's Renewable Fuels Assurance Scheme (RFAS). The allocation of the renewable fuel usage and the methodology for determining transport and distribution GHG emissions have been verified under the RFAS Fleet scheme.

This declaration is non-transferable: fleet operators must be approved under RFAS Fleet to issue declarations to their customers. Scan the QR code for a list of approved companies.

RFAS Period:	2025-2026	**www.zemo.org.uk/RFASFleet**	Version 1.0

Figure 4: An example of a Fleet GHG Emissions Declaration used to convey sustainability information for renewable fuel used for delivery of goods or services

RFAS Fleet enables the market to decarbonise faster by allowing vehicle operators to offer reduced emissions transport services to customers who are looking to decarbonise their supply chains, and reduce their Scope 3 emissions, providing added value to RFAS Fleet users.

Biodiesel (FAME)

UK Supply Chains and Market Trends

Biodiesel is a biofuel typically made from used cooking oils (UCO) and food wastes and is designed for use in diesel engines. It is supplied either as a blend with conventional diesel, or, in some cases, as a neat fuel. UK retail diesel is capped at a 7% biodiesel blend, known as B7, while higher blends supplied to HDV fleets include B20 (20% biodiesel), B30 (30% biodiesel), and B100 (100% biodiesel).

While the feedstocks can overlap with those used for renewable diesel (e.g. used vegetable oils and animal fats), biodiesel is produced via transesterification, converting oils and fats into fatty acid methyl esters (FAME). This relatively low temperature process can also generate co-products that may be upgraded into value-added materials, such as glycerine.

To be sold in the UK, biodiesel must meet precise European fuel specifications. Lower blend products (e.g. B20 and B30) are required to comply with the European Biodiesel Standard EN 16709, while B100 must meet the EN 14214 specification.

Several companies produce biodiesel in the UK, supplying a range of high-blend products to commercial customers. Looking ahead, Zemo Partnership's modelling suggests that increasing electrification of the UK's car and van fleet over the next decade, and accompanying decline in retail diesel consumption, could liberate biodiesel volumes currently used in the light duty sector. This presents an opportunity to divert larger volumes of high-blend biodiesel into HGV and NRMM markets across the UK[9].

RFAS Approved Suppliers

As of Q2 2026, three companies are approved under the RFAS to supply biodiesel blends in the UK.

A full, up-to-date list of suppliers can be accessed at www.Zemo.org.uk/RFAS

Deployment in Fleets

B20 and B30 have achieved the greatest market penetration in the UK. B20, in particular, has been deployed across several thousand buses over the last decade, with operator Metroline widely recognised as an early pioneer. A number of companies, including Alfred Hymas, Greenergy Flexigrid, McDonald's, Stagecoach, and Transdev Blazefield have adopted high-blend biodiesel as a route to decarbonising their HDV fleet.

[9] Zemo Partnership (2022): Decarbonising Heavy Duty Vehicles and Machinery – Proposals for a UK Renewable Diesel Incentive

Zemo Partnership estimates that around 1,500 HGVs are currently operating on high-blend biodiesel, with the remaining allocated for use in buses.

GHG Emission Performance

GHG emissions savings are strongly influenced by the proportion of renewable fuel in the final blend; higher renewable content generally delivers greater WTW savings. For example, when compared with retail diesel, B100 can achieve average WTW savings of around 81%, while B30 is typically closer to 22%.

Based on data from fuel suppliers approved under the RFAS, the GHG emissions performance figures for high-blend biodiesel supplied in the UK are presented in Table 1.

Table 1: Estimated GHG emissions performance of biodiesel and associated primary feedstocks, as reported under the Renewable Fuels Assurance Scheme

	B20	B30
Average WTW GHG Emission Savings (vs. B7 retail diesel)	12 to 16%	20 to 23%
Primary Sustainable Feedstocks	UCO, food waste, sewage sludge, Palm Oil Mill Effluent (POME) oil, soapstock acid oil contamination	

Vehicle Compatibility and Availability

Euro VI HDVs are available from all major original equipment manufacturers (OEMs) with compatibility for B20, B30, and B100, subject to the biodiesel meeting the applicable fuel quality standard. Fleet operators may also choose to purchase an independent warranty to cover engines and components when operating on higher biodiesel blends.

In some cases, HGV manufacturers can supply specific components (e.g. fuel filters and seals), or offer retrofit, to support operation on high-blend biodiesel. Operators should confirm with their manufacturer which blends are covered under warranty for each vehicle model ahead of biodiesel deployment.

Refuelling Infrastructure

High-blend biodiesel (B20 and B30) can be delivered directly to fleet depots using standard diesel storage and refuelling equipment. Before switching to higher blends, it is recommended that storage tanks are cleaned to remove the sludge that

naturally accumulates during fossil diesel use. High-blend biodiesel is not currently available through retail fuel forecourts.

Storing B100 will require additional equipment and more active management than standard diesel. All diesel products have a temperature at which they begin to gel in cold conditions. Pure waste-based B100 is affected when temperatures fall between 0°C and 10°C, depending on the feedstock, and must be kept above this temperature, known as the Cold Filter Plugging Point (CFPP).

B100 suppliers can advise on appropriate storage solutions and can provide infrastructure such as heated tanks, heated lines, and suitable dispersing pumps. Biodiesel is more hygroscopic than fossil diesel, meaning it absorbs and holds more moisture from the surrounding environment. Subsequently, water contamination should be avoided as it can promote microbial growth within storage tanks. Although rare, unchecked microbial activity can lead to fuel filter blockages. Anti-microbial products can be used to prevent this in both storage and fuel tanks.

To manage cold-weather performance and avoid the need for additional vehicle or storage equipment, some operators will utilise biodiesel blends seasonally; opting for lower biodiesel blends during winter and higher blends during summer.

Financial Information

Step 1
Vehicle Readiness

- **Minor upgrades for B20/B30**: some manufacturers require a biodiesel upgrade package, typically costing a few hundred pounds at vehicle production
- **Retrofitting B20/B30**: costs can reach **up to £2,000 per vehicle**
- **Major conversion for B100**: vehicle conversions include a system for warming the fuel. Factory or retrofitted conversions typically cost **between £6,500 to £8,000 per vehicle**

Step 2
Fuel Procurement

- **Fuel costs**: depending on the supply chain, fuel costs can be **neutral or cheaper** than fossil diesel

Step 3
Maintenance Planning

- **Maintenance regimes**: some additional maintenance is expected, including filter inspections, anti-oxidation treatment, and more frequent oil changes. Additional maintenance costs for B30 ranges **between £1,000 to £2,000 per annum**

Step 4
Infrastructure Set Up

- **Few upgrades required for B20/B30**: biodiesel can be stored in, and dispensed from, existing infrastructure at **no extra cost**
- **Additional B100 infrastructure**: B100 must be kept above the CFPP; this can result in **some additional costs** from seasonal management and heated storage

Ideal Use Case

- **Fleets reliant on bunkered infrastructure e.g. urban and regional operations using back-to-base refuelling strategies**
- **Ideal for ease of use and utilisation of standard vehicles**

Case Study: Greenergy Flexigrid – Biodiesel (FAME) Deployment

Greenergy Flexigrid Ltd is a national UK fuel logistics company, established in 2012 as Greenergy's in-house haulier. The business provides fuel distribution services to retail and commercial customers nationwide, and has diversified into related sectors, such as hydrogen and bitumen transport. Flexigrid has grown to become a national fuel delivery company in the UK, for both Greenergy and third-party customers.

With 24/7 operations and a UK-wide footprint, Flexigrid plays a critical role in Greenergy Group's downstream supply chain.

Fleet and Operation

Flexigrid operates a fleet of over 250 HGVs; including over 200 fuel tankers. The fleet mostly consists of 44t GVW articulated vehicles, with a number of smaller 'urban' artics and rigids.

The fleet is supported by over 600 drivers operating from more than 20 depots across the UK – including one located at the Port of Cardiff. The fleet completes approximately 180,000 deliveries annually, delivering to over 3,000 customers. In 2025, Flexigrid delivered 5.7 billion litres of road fuel, and covered more than 15 million miles.

Decarbonisation Approach

As part of the Greenergy Group, a leading European waste-based biodiesel producer and fuel supplier, Flexigrid is committed to reducing operational GHG emissions. The company has focused on solutions that can deliver immediate emissions reductions without disrupting safety-critical fuel distribution activities.

Technology Selection

Flexigrid adopted high-blend biodiesel, such as B20, as a readily available solution across a portion of its fleet. B20 is compliant with EN 14214 specifications, delivers lower lifecycle carbon emissions than conventional B7 diesel, and provides the equivalent vehicle performance.

Flexigrid has prioritised the use of high percentage biodiesel where decarbonisation and cost benefits can be realised immediately. With over 75% of the fleet capable of operating on high biodiesel blends, this approach enables rapid cross-fleet deployment.

Alternative decarbonisation technologies such as LNG or battery electric vehicles were not considered viable due to ADR and Safe Load Pass (Petroleum) regulatory requirements for accessing UK petroleum loading facilities. High biodiesel blends were therefore selected as the most practical and cost-effective solution available.

Operational Considerations

Flexigrid worked closely with its vehicle manufacturers to confirm engine compatibility with high biodiesel blends. B20 was introduced through a trial in their Thames-based fleet, where it was tested under real-world conditions over a sustained period.

The trial demonstrated favourable costs and emissions reductions from the use of B20, with no adverse impacts on vehicle performance, fuel consumption, or operational reliability. Building on the success of the trial, Flexigrid has continued to extend and increase rollout across the fleet.

Infrastructure and Reliability

No modifications were required to existing bulk diesel storage tanks, which follow the same hygiene and inspection regimes recommended for standard diesel. To avoid increased downtime, any oil and filter changes are scheduled to coincide with planned maintenance inspections.

Refuelling takes place at Flexigrid terminal depots, where the company has invested in additional bunkering capacity to support increased B20 usage, with further expansion planned. B20 has been found to be a reliable decarbonisation solution, with vehicles able to switch seamlessly between high biodiesel blends and standard B7 diesel without any operational impact.

Cost and Supply Factors

B20 can result in minor increases in maintenance costs, such as more frequent oil and filter changes, depending on the overall annual vehicle mileage. However, Flexigrid has found these to be offset by lower fuel cost per litre when compared to B7 diesel. Biodiesel is provided by Flexigrid's parent company, Greenergy.

Although there is a minimal new vehicle cost impact for HGVs specified as high bio-compatible, no significant capital investment or engine modifications were required, making high biodiesel blends a financially attractive decarbonisation option.

Greenhouse Gas Savings and Future Plans

During a nine-month period from 1st January to 30th September 2025, Flexigrid's use of B20 resulted in the following (compared to standard B7 diesel):

- An average GHG emission reduction of 13% (annual basis).
- Total savings of 609 tonnes of CO_2e across the fleet.

Building on this success, Flexigrid plans to further expand the availability and use of B20 across its nationwide operations, to continue delivering immediate and scalable emission reductions.

Renewable Diesel – HVO

UK Supply Chain and Market Trends

Renewable diesel refers to paraffinic diesel produced from biogenic feedstocks. It is considered a 'drop-in' fuel, meaning it can be used in existing vehicles without any engine or fuel storage modifications. To be sold in the UK, renewable diesel must meet the paraffinic fuel quality standard EN 15940. Although renewable diesel can be blended with fossil diesel, most operators choose to use it as a 100% replacement.

The most common production pathway for renewable diesel supplied to the UK is the hydrotreatment of oils and fats using hydrogen. This process produces what is widely known as hydrotreated vegetable oil (HVO). While early HVO production relied on virgin vegetable oils, today the primary feedstocks are waste-derived oils and fats. Advances in feedstock processing are also enabling a broader range of biogenic waste materials to be utilised. HVO has a longer shelf life than diesel and is less prone to contamination from diesel bug, which can be a benefit for back-up generators and low utilisation equipment.

The UK currently has no domestic HVO production capacity, so all renewable fuel is imported from Europe, Asia and, more recently, the United States. Over the past year, imports have risen sharply due to expanding international production capacity.

Renewable fuel has grown in popularity and is now available at selected dedicated truck refuelling sites and truck stops. Producers are also beginning to upgrade hydrotreatment facilities to enable the production of sustainable aviation fuel (SAF) alongside renewable paraffinic diesel. However, the SAF market remains at an early stage of development.

RFAS Approved Suppliers

As of Q2 2026, forty-nine companies are approved under the RFAS to supply renewable diesel in the UK. A further three companies are approved to supply to markets outside the UK, including Austria, Germany, and Spain.

A full, up-to-date list of suppliers can be accessed at www.Zemo.org.uk/RFAS

Deployment in Fleets

Renewable diesel adoption has risen substantially over the last five years in HGV fleets and is proving to be a popular decarbonisation option for companies operating NRMM at construction and demolition sites. Organisations deploying renewable diesel as part of their fleet decarbonisation strategy include Aldi, Biffa, DHL, Howard Tenens, Royal Mail, Travis Perkins Group, and XPO Logistics.

Zemo Partnership estimates that nearly 8,000 HGVs are running on renewable diesel.

GHG Emissions Performance

Based on data from fuel suppliers approved under the RFAS the GHG emissions performance figures for renewable diesel supplied in the UK are presented in Table 2. In instances where renewable diesel is blended with fossil paraffinic fuel or mineral diesel, the GHG emissions savings will be lower.

Table 2: Estimated GHG emissions performance of renewable diesel and associated biomass feedstocks, as reported under the Renewable Fuels Assurance Scheme

	Renewable Diesel
Average WTW GHG Emission Savings (vs. B7 retail diesel)	81 to 86%
Primary Sustainable Feedstocks	UCO, spent bleaching earth oil, biogenic waste and residues, food waste, POME oil

Further to the CO_2 emissions benefits of renewable diesel, use of HVO is also reported to result in a reduction of air pollutants, including particulate matter and nitrogen oxides. Subsequently, some operators can experience reduced AdBlue usage and fewer diesel particulate filter (DPF) regenerations.

Vehicle Compatibility and Availability

All major truck manufacturers approve the use of renewable diesel in Euro VI HGVs, predicated on the fuel meeting the European fuel quality standard. Fleet operators are advised to obtain confirmation from their fuel supplier that renewable diesel received complies with the EN 15940 paraffinic diesel specifications. For older vehicles (pre-Euro V), operators should check with their HGV manufacturer to verify engine compatibility.

As HVO is a drop-in fuel, vehicles can switch freely between renewable and fossil diesel. This allows operators to use conventional diesel in instances where access to HVO may be limited, such as when away from bunkered refuelling facilities.

Refuelling Infrastructure

Renewable diesel can be supplied through depot bunkering, via deliveries from fuel suppliers, and is also available across the UK public refuelling network (Figure 6). Open access forecourts selling HVO have increased significantly over the last few years.

Figure 5: Map of identified open access forecourts selling HVO across the UK

As of early 2026, there are almost 60 sites that supply HVO for commercial vehicles, with most located along major UK logistics routes (Figure 6). In Wales, three refuelling sites have been identified: one at Nantycaws, Carmarthen, and two in Wrexham, including Ruabon.

Financial Information

Step 1
Vehicle Readiness

- **No upgrades required**: Renewable diesel is a drop in fuel; standard diesel vehicles can be used **at no extra cost**

Step 2
Fuel Procurement

- **Fuel costs**: the cost of fuel per litre is **5 to 20% more expensive** than fossil diesel

Step 3
Maintenance Planning

- **No additional maintenance**: maintenance regimes are identical to diesel vehicles, requiring **no extra cost**

Step 4
Infrastructure Set Up

- **Tank cleaning**: Bunkering of renewable diesel can be done in existing diesel storage tanks, though **tanks should be cleaned** prior to filling with HVO to ensure longer shelf-life benefits are realised

Ideal Use Case

- **Can be deployed in a range of fleets, including high mileage, heavy duty operations, due to drop in fuel status.**
- **Ideal for ease of use, fast deployment, and utilisation of existing vehicles, though limited by public refuelling locations.**

Case Study: North Wales Fire and Rescue Service – HVO Deployment

North Wales Fire and Rescue Service, founded in 1996, operates across Anglesey, Gwynedd, Conwy, Denbighshire, Flintshire, and Wrexham – an area with a resident population of nearly 700,000. The Service employs around 900 staff across 44 stations and a number of corporate sites.

Fleet and Operation

The red fleet (front line operational response vehicles) consists of:

- 54 fire appliances,
- 1 incident command unit,
- 31 specialist vehicles e.g. all terrain vehicles (ATVs), environmental protection, narrow access, foam carrier, prime mover (modules), and
- 3 aerial ladder platforms.

The vehicles in the white fleet (those not equipped for emergency response) are being replaced by battery electric vehicles at the point of routine replacement.

The North Wales Fire and Rescue Service operates across an expansive, and largely rural, geographical area of roughly 2,400 square miles.

Decarbonisation Approach

To support Wales' ambitions for a net zero public sector by 2030, HVO has been selected as the most viable solution to help decarbonise the operational fleet. As a frontline responder to climate change, the Service aims to lead by example in reducing emissions, particularly Scope 1 emissions, of which diesel usage accounts for approximately half.

Technology Selection

HVO was chosen because no other scalable, practical alternative can currently meet the turnaround and range demands of such a large and dispersed area. With only one electric fire appliance on the market, and current infrastructure unable to support vital rapid-response needs, transitioning the full fleet to alternative technologies could take decades.

HVO offers a straightforward and obvious solution, with minimal operational compromise. Storage life is more favourable than conventional diesel, and its compatibility with diesel in any blends provides reassurance that crews can fill up conventionally at filling stations, if required.

Operational Considerations

Ahead of the planned wider HVO rollout in late 2026, refuelling is being carried out on site at a trial location. The Service is currently piloting a Piusi B.Smart dispensing system, which assigns individual driver ID codes for staff. The trial is helping to

identify potential failure points in the refuelling process before a wider deployment of the system.

Infrastructure and Reliability

The Service has invested in one tank and dispensing control system for the pilot, with budget allocated for ten additional units. Although a turnkey, pre-assembled system was selected, significant challenges were encountered bringing the first site into operation, including:

- Difficulty sourcing companies willing to assemble and maintain complete dispensing systems, as most suppliers focused solely on selling tanks and components.
- Ongoing reliance on the manufacturer for technical support, causing delays due to their location outside the service area.

The Service has also identified potential delivery challenges for the more isolated rural sites, though these are expected to be mitigated through multi-site delivery route planning.

Despite these hurdles, extensive technical assessments and vehicle testing by the Fleet Department indicate that HVO performs indistinguishably from conventional diesel in day-to-day operations.

Cost and Supply Factors

Key cost considerations include:

- Infrastructure: Approximately £15-20k per fire station for a tank and dispersing system.
- Fuel: HVO has a fluctuating cost premium over conventional diesel.

To manage fuel cost volatility, the Service aims to negotiate a fixed-price contract once additional tanks are operational and substantial purchase volumes can be committed.

Supply constraints have mainly concerned infrastructure set-up, and guaranteed delivery to isolated sites, though mitigation strategies are in place.

Greenhouse Gas Savings and Future Plans

Replacing fossil diesel with HVO is expected to deliver substantial reductions in Scope 1 Greenhouse Gas emissions. Looking ahead, North Wales Fire and Rescue Service is embarking on a significant programme to modernise and decarbonise its station estate and training facilities.

Expanding HVO use across the fleet, coupled with ongoing electrification of the white fleet, forms a core part of the Service's path towards meeting net zero by 2030.

Biomethane

UK Supply Chain and Market Trends

Biomethane is a type of renewable methane gas produced from the anaerobic digestion (AD) of organic waste feedstocks, such as those generated from arable and livestock agricultural practices, sewage treatments, and municipal activities. As part of the production process, CO_2 and other contaminants are removed to upgrade biogas to biomethane. The UK's biomethane supply is typically produced both domestically and from European AD plans.

As biomethane is chemically similar to natural gas, it can be injected into the National Gas Grid; a process that is permitted under the RTFO and facilitates its distribution directly to refuelling sites. In some cases, it is also dispensed directly to vehicles. Biomethane is commonly dispensed as compressed biomethane (bio-CNG) or as liquefied biomethane (bio-LNG).

RFAS Approved Suppliers

As of Q2 2026, three companies are approved under the RFAS to supply biomethane in the UK. One further company is approved to supply biomethane in the Republic of Ireland.

A full, up-to-date list of suppliers can be accessed at www.Zemo.org.uk/RFAS.

Deployment in Fleets

Biomethane has gained strong traction across the freight sector in recent years, with artic HGV fleets experiencing the greatest uptake. A growing number of major operators have committed to running biomethane-powered HGVs, including Arla Foods, ASDA, B&Q, Evri, Gregory Group, John Lewis Partnership, Nestlé, Ocado, Tesco, and Warburtons.

Zemo Partnership estimates approximately 3,800 HGVs operate on biomethane in the UK, and anticipates up to 10,000 biomethane HGVs on UK roads by 2030.

GHG Emissions Performance

Based on data from fuel suppliers approved under RFAS, the GHG emissions performance figures for compressed and liquefied biomethane supplied in the UK are presented in Table 3. Biomethane can deliver very high GHG emissions savings, but depends heavily on the feedstock used in its production.

Table 3: Estimated GHG emission performance of compressed and liquefied biomethane, and associated biomass feedstocks, as reported under the Renewable Fuels Assurance Scheme

	Bio-CNG	Bio-LNG
Average WTW GHG Emission Savings (vs. B7 retail diesel)	78 to 83%	72 to 85%
Primary Sustainable Feedstocks	Food waste, organic municipal solid waste, sewage sludge, sugar beet tops, manure	

Biomethane produced from wet manure (livestock slurry) can achieve a negative GHG emission intensity, resulting in high GHG emission savings. When manure is stored in the open, it naturally releases methane and nitrous oxides into the atmosphere; two highly potent greenhouse gases. Methane has around 27 times the Global Warming Potential (GWP) of carbon dioxide, while nitrous oxide is roughly 273 times more powerful[10].

By capturing these gases and converting them into biomethane, these emissions are avoided and the process delivers exceptionally high GHG savings. The scale of the savings will depend on the proportion of wet manure in the feedstock. For example, compressed biomethane produced entirely from wet manure can achieve GHG emission savings of over 100%.

Additional abatement is possible when the CO_2 generated during biomethane production is captured and used to replace fossil derived CO_2 in industrial applications, such as in greenhouses or the beverage sector. AD plant operators across Europe are actively exploring this route.

Vehicle Compatibility and Availability

Gas-powered HDVs can operate interchangeably between natural gas and biomethane, with no impact on fuel consumption or engine warranty. Engines are either dedicated spark ignition units (for LNG or CNG vehicles) or High Pressure Direct Injection (HPDI) systems, the latter is used in Volvo's LNG trucks. Lower intensity operations typically perform best with spark ignition technologies, with higher intensity operations better suited to HPDI systems; though preferences and existing relationships are deciding factors for many operators.

[10] Greenhouse Gas Protocol (2024): IPCC Global Warming Potential Values

The latest compressed and liquified biomethane HGVs offer ranges exceeding 300 miles. Both CNG and LNG models are available as rigid and articulated vehicles up to 44-tonnes GVW. Current examples include the Scania L, P, G, R and S Series, the Iveco S-Way NP and Eurocargo, and the Volvo FH and FM.

Refuelling Infrastructure

Fleet operators can install refuelling infrastructure at their depots or use public access refuelling stations. Refuelling with biomethane is straightforward and typically takes no longer than filling up a diesel vehicle.

Biomethane refuelling stations can be categorised into three types, depending on the product(s) they provide:

- **Bio-CNG stations** are supplied either via the national gas grid or by cylinder tanker (a so-called 'Mother and Daughter' arrangement), delivering gas at 200 to 250 bar pressure
- **Bio-LNG stations** consist of a cryogenic tank and a fuel dispenser, and supply liquid fuel at 2 to 8 bar pressure.
- **Bio-LCNG stations** provide both bio-CNG and bio-LNG. Bio-LNG is vaporised and compressed into storage tanks to enable bio-CNG dispensing, and sophisticated bio-LCNG stations may also use bio-LNG tank 'boil off' to produce additional bio-CNG.

Depot-Based Solutions

Depot refuelling is best suited to fleets operating a back-to-base duty cycle. Infrastructure requirements depend on fleet size: smaller fleets can be served by trailer-based or skid-mounted stations, whereas larger fleets, or those needing rapid refuelling, may require a direct grid connection.

In all cases, sites will need sufficient space for equipment installation, a suitable electrical power supply, and access to a gas main. Coordinating the procurement of new gas vehicles with the installation of refuelling infrastructure is essential, as both need to be planned and timed carefully.

The cost attached to installing a depot refuelling station will vary significantly, and as such we are unable to provide specific figures in this guide. Factors which influence costs include:

- **Capacity**: The amount of gas the station will need to provide, as driven by the number of vehicles, daily mileage, and forecast future demand.
- **Gas Grid Connection**: Whether the station will be grid connected, the distance to the mains supply, and the pressure of the local gas grid.
- **Electricity Grid**: Power availability and distance to the three phase mains.
- **Refuelling**: Number of refuelling nozzles required.

- **Footprint**: Size of the refuelling station and available space at the depot.
- **Maintenance**: Management of maintenance costs.

Taking these factors into account, the typical payback period for depot-based stations is between two and six years.

Instead of purchasing a gas refuelling station outright, fleet operators can opt for a wet-leasing arrangement with a gas infrastructure supplier. Under this model, the supplier provides biomethane and the associated CNG or LNG refuelling infrastructure; overseeing the station's installation, operation, and maintenance.

Under a wet-lease, the station will be provided and installed at no cost to the end user. Instead, biomethane will be supplied at a marginally higher per-unit rate to reflect the additional investment and risk undertaken by the supplier. Contracts typically run for around ten years, and include full repair and maintenance services.

Adopting a wet-leasing approach can help operators reduce the capital expenditure required to introduce new gas vehicles, and provide assurance that the refuelling infrastructure is expertly operated by specialists in the gas supply industry.

Grid Connections

Refuelling stations connected to the national grid require gas to be compressed onsite prior to dispensing into vehicles. Consequently, it is important to understand the specifications of the local gas main to ensure sufficient capacity and pressure to meet supply needs:

- A higher pressure grid connection will reduce the amount of additional compression required. This lowers operating costs and associated GHG emissions, but can increase installation costs if the gas main is located far from the compressor unit.
- A lower pressure grid connection will require more onsite compression. This can increase the need for additional gas cylinder storage and may limit biomethane throughput. However, the gradual compression of gas into tanks can be well suited to fleets with slower refuelling requirements.

To facilitate rapid refuelling, grid connected stations can be 'fast-fill'; sufficient storage is maintained to allow vehicles to be filled in minutes. Where vehicle use is less intensive, a 'slow-fill' station can compress biomethane directly into vehicle tanks over several hours, reducing pressurised gas storage costs. To date, this approach has only been implemented in Spain and Sweden.

Public Refuelling Solutions

The UK's biomethane refuelling network currently has the capacity to fuel around 15,000 trucks per day, equivalent to roughly 10% of the UK's artic HGV fleet. Identified sites are shown in Figure 7, and as of Q1 2026, the network is understood to comprise:

- 33 bio-CNG refuelling stations; 17 of which are open access, 9 are private, single operator stations, and the remainder allow access by agreement. A further 13 sites are planned by the end of 2027.
- 37 bio-LNG refuelling stations; 4 of which are open access, and the remainder allow access by agreement. A further 10 sites are planned by the end of 2027.

In Wales, CNG Fuels operates an open access forecourt in Bangor, near the A55, with a further site under construction near the M4 in Magor, facilitating public biomethane refuelling along strategic logistics corridors in the North and South.

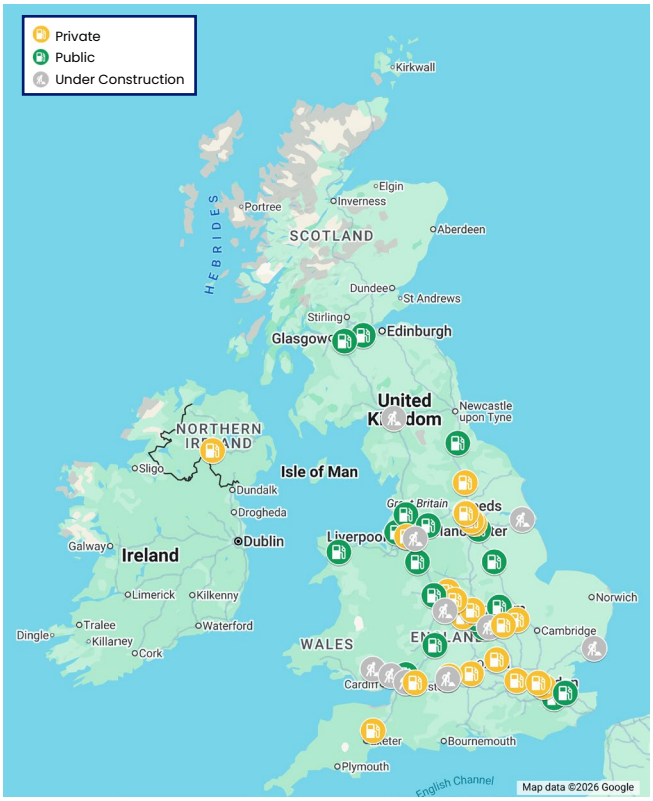


Figure 6: Map of identified bio-LNG and bio-CNG sites across the UK.

For new locations, temporary stations can be deployed via skid-mounted solutions as permanent facilities are developed, satisfying short-term demand. A national biomethane network could be developed relatively quickly, supporting the refuelling needs of tens of thousands of trucks at greater speed and cost effectiveness than equivalent ZEV charging provisions.

Financial Information

Step 1
Vehicle Readiness

- **Gas vehicle costs**: Gas HGVs can cost around **25 to 40% more** than a conventional diesel equivalent when purchased outright. Gas vehicles are also available on lease contracts.
- **High mileage benefits**: Long-haul, high mileage operations can experience the greatest cost and carbon benefits; historically, new gas vehicles have **payback periods of 2 to 3 years**.

Step 2
Fuel Procurement

- **Fuel costs**: Biomethane is **cheaper than fossil diesel** on a pence per mile basis, partly driven by a 50% fuel duty rate differential between diesel and methane (currently in place until 2032).
- **Efficiency losses**: Some models, particularly those using spark ignition engines, suffer a **small loss in efficiency and torque** compared to diesel equivalents.

Step 3
Maintenance Planning

- **Additional maintenance costs**: Gas vehicles are **20 to 25% more expensive** than diesel vehicles to maintain.

Step 4
Infrastructure Set Up

- **Varied costs**: **Infrastructure costs vary** depending on the adopted refuelling strategy. Capital costs for depot infrastructure can be recovered through lower operating costs, whereas operators opting for a wet-lease agreement can save on capital costs, but increase operating costs.

Ideal Use Case

- **Fleets with intense, high-mileage duty cycles are likely to experience the greatest cost-effectiveness and decarbonisation benefits.**
- **Dedicated gas vehicles are a prerequisite, and operations may experience range limitations and public refuelling challenges.**

Case Study: Gregory Group – Multi-Fuel Decarbonisation Strategy

Gregory Group is one of the UK's largest privately owned logistics providers, operating for over 100 years and comprising five transport brands: Gregory Distribution, Hayton Coulthard, ARR Craib, Pollock, and John Mitchell.

The Group operates a large fleet and a national network of 50+ sites including 20 warehouses, serving sectors such as retail, food and drink, dairy, manufacturing, energy, utilities, forestry, and construction.

Fleet and Operation

Gregory Group operates over 1,400 trucks and 2,500 trailers across diverse logistics services, with a mixed fleet of alternatively powered vehicles, of which:

- 200 vehicles operate using HVO
- 3 trucks operate using bio-LNG
- 2 trucks operate on bio-CNG
- 20 trucks are fully battery electric

The fleet is comprised of a wide variety of vehicles and trailers, including rigids (up to 32t) and artics (up to 44t), bulk liquid tankers, curtainsider and refrigerated trailers, walking floors, tippers, hooklifts, containers and flatbeds.

Operations are equally diverse, spanning national general fleet 'tramper' work, through to double and single shifted back-to-base operations.

The Group operates ambient and temperature-controlled distribution, pallet networks, milk collection and specialist transportation as well as warehousing and picking operations – supporting customers across both fast-moving consumer industries and more specialist, industrial supply chains.

Decarbonisation Approach

Gregory Group has set SBTi-validated emission reductions targets for 2030, with a goal to reach net zero by 2038. To deliver on these commitments, the company is deploying a mix of bio-CNG, bio-LNG, HVO, and battery electric vehicles, as part of its transitional and long-term transport decarbonisation strategy.

Recognising that its Scope 1 emissions directly impact customer Scope 3 emissions, the Group views fleet-wide decarbonisation as essential to meeting customer requirements. The company's progress in decarbonising its operations supports wider value-chain climate objectives and contributes to the broader decarbonisation of the transport sector.

Technology Selection

The Group selected its decarbonisation technologies based on emissions-reduction potential, operational practicality, cost and customer expectations. Choices have

also been driven by a genuine curiosity to test, learn, and try new solutions in real-world conditions, which has enabled the development of a diverse low carbon fleet tailored to different operational needs across the business.

Operational Considerations

Technology deployment is matched to operational requirements, such as payload, range, duty cycle, and infrastructure availability. This approach minimises disruption and ensures that the right technology is assigned to operations where they are most effective, resulting in few operational changes once introduced.

Infrastructure and Reliability

The Group utilises a combination of onsite refuelling and charging infrastructure and public fuel stations. HVO is bunkered at several company sites, with selected diesel tanks repurposed to support its rollout.

In terms of reliability, HVO has proven to be the most straightforward solution, with fuel economy almost identical to diesel and no risk of asset stranding.

The Group sources bio-CNG and bio-LNG from RFAS-approved suppliers and utilises their public refuelling facilities.

Battery electric trucks are charged onsite using renewable energy from the grid, supplemented by onsite solar generation at multiple locations.

These vehicles have been generally reliable, though their range and payload constraints necessitate careful planning. Driver feedback has been positive, and as both range and the UK charging network continues to expand, EVs are expected to become increasingly viable across a broader range of operations.

Cost and Supply Factors

Costs vary considerably across the different technologies. HVO carries a higher fuel cost and the Group passes this on to those customers who have chosen this option, though they also receive the carbon reduction benefit. As HVO requires no vehicle or tank modifications and follows the same maintenance regime as diesel, it introduces no incremental operating cost or complexity apart from the oncost of the fuel itself.

Electrification remains the most capital-intensive option, requiring significant investment in charging infrastructure and substantially higher upfront vehicle CAPEX, with electric HGVs costing up to three times more than diesel equivalents. Gregory Group's involvement in the ZEHID consortium has helped facilitate access to vehicles and supported early deployment.

Electric HGVs require less routine maintenance; however, the Group has continued reliance on external servicing for both BEV and biogas vehicles. The Group is actively assessing the feasibility of bringing some of these skills in-house.

Fuel supply stability has generally been good. Biogas availability tightened temporarily during the start of the Russia-Ukraine conflict, but market conditions have since normalised. HVO availability remains robust, although pricing has been volatile and challenging to forecast. These fluctuations are managed as part of the Group's broader fuel procurement strategy which includes fixed price supply contracts.

All renewable fuel used by the Group is sourced from RFAS-approved suppliers, including Vitol and Ford Fuels (HVO), ViGo (bio-LNG), and CNG Fuels (bio-CNG). Ensuring that all fuel is supported by independently verified supply chain declarations is an important part of the company's engagement with customers, providing confidence in the origin, sustainability and overall integrity of the fuel.

The Group is proud to be the first operator in the UK to be approved under RFAS Fleet, which extends the chain of custody by covering the complete lifecycle of the fuel through to the end-customer. The scheme enhances transparency across transport decarbonisation, supports both the Group's, and its customers' sustainability objectives, and provides robust assurance regarding feedstocks, emissions performance, and overall fuel provenance.

Greenhouse Gas Savings and Future Plans

Gregory Group has achieved an estimated 20% reduction in Scope 1 emissions relative to its 2021/22 baseline, driven largely by the adoption of HVO, which delivers an 83-85% GHG reduction per litre compared to diesel. Biogas offers up to 75% savings depending on feedstock, while battery electric HGVs can reduce lifecycle emissions by up to 90% when powered by renewable electricity.

Electrification is viewed as the most impactful long-term decarbonisation pathway as both infrastructure and vehicle availability continue to scale. Renewable fuels remain an important transitional pathway, with HVO playing a particularly valuable role in reducing emissions from existing diesel vehicles and ensuring progress can be maintained throughout vehicle replacement cycles.

Looking ahead, Gregory Group intends to continue scaling the use of low carbon fuels while accelerating fleet electrification as its core long-term strategic priority.

The Group also actively monitors emerging technologies, and remains prepared to trial, evaluate, and adopt new solutions as they become operationally and commercially viable for the Group as well as its customers.

Pollock
Pollock

THERMO KING
Gregory
Gregory

Glossary of Abbreviations

AD	Anaerobic Digestion
B7	Biodiesel with 7% renewable content
B20	Biodiesel with 20% renewable content
B30	Biodiesel with 30% renewable content
B100	Biodiesel with 100% renewable content
Bio-CNG	Compressed Biomethane
Bio-LNG	Liquefied Biomethane
CFPP	Cold Filter Plugging Point
CO_2	Carbon Dioxide
CNG	Compressed Natural Gas
DfT	Department for Transport
ESG	Environmental, Social and Governance
FAME	Fatty Acid Methyl Ester
GHG	Greenhouse Gas
GLEC	Global Logistics Emissions Council framework
GVW	Gross Vehicle Weight
HPDI	High Pressure Direct Injection
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
HVO	Hydrotreated Vegetable Oil
ICE	Internal Combustion Engine
ISCC	International Sustainability and Carbon Certification
$ktCO_2e$	Kilotonnes of Carbon Dioxide Equivalent
LCNG	Refuelling station that provides both LNG and CNG
LNG	Liquefied Natural Gas
NRMM	Non-road Mobile Machinery
OEM	Original Equipment Manufacturer
POME	Palm Oil Mill Effluent
RFAS	Renewable Fuels Assurance Scheme
RFD	Renewable Fuel Declaration
SAF	Sustainable Aviation Fuel

SBTi	Science Based Targets initiative
SME	Small and Medium Enterprise
UCO	Used Cooking Oil
WTW	Well-to-Wheel
ZEHID	Zero Emission HGV and Infrastructure Demonstrator
ZEV	Zero Emission Vehicle