inver

Your guide to

HVO

Renewable Diesel

Contents

Introduction

Ireland's Climate Action Plan aims to reduce greenhouse gas emissions (GHG) by 51% by 2030. As the country transitions to a lower carbon future, the Government and industry are working together to develop viable and renewable alternatives to fossil fuels. While electrification and hydrogen require new infrastructure, biofuels are a readily available solution to reduce emissions in internal combustion engine (ICE) vehicles, which are expected to remain on the roads for the next decade and beyond.

The Renewable Transport Fuel Obligation (RTFO) mandates that an increasing percentage of road fuels must come from renewable sources. According to the "Energy in Ireland 2024" report, published by the Sustainable Energy Authority of Ireland (SEAI), transport is the country's largest sector by energy consumption, and road transport accounts for 75% of demand within the overall sector. Despite a nominal increase of 1% in road diesel use in 2023, the blending of biofuels displaced diesel, and in this instance, helped lower overall emissions.

In 2025, the RTFO mandate increased to 25% by energy content, and the mandate is planned to further increase to 32% in 2026. Hydrotreated Vegetable Oil (HVO), also known as renewable diesel, is expected to play an increasingly significant role in meeting these targets.

With over 40 years of expertise in supplying fuels across Ireland, Inver supports businesses and motorists transitioning to lower-carbon energy by making HVO widely available nationwide.

This brochure is for general guidance only and is not intended to provide definitive advice on HVO.


inver
HVO
Renewable Diesel
Reduce your net carbon emissions by up to
90%
inverenergy.ie
FLAMMABLE
3
30
1223
LONG VEHICLE
SCANIA
YIELD

What is HVO?

HVO is an advanced biofuel that can reduce carbon emissions by up to 90% compared to conventional diesel. As a second-generation biofuel, it is made from organic raw material such as agricultural residue, non-food crops and waste products.

HVO can be blended with diesel at higher rates or used on its own as a direct replacement for fossil diesel, offering a seamless transition to lower-emission operations without requiring modifications or significant capital investment in infrastructure.

From 1 July 2025, the Irish Government has amended the regulations, specifying that HVO derived from palm oil mill effluent ('POME') can no longer be awarded additional RTFO certificates. POME is a waste product derived from palm oil production. Inver has not supplied HVO derived from palm since 2023.

What is the difference between HVO and biodiesel?

HVO and biodiesel are both biofuels made from organic raw materials. However, they have different manufacturing processes, chemical properties, carbon intensities and performance attributes.

HVO is produced through a hydrotreatment process that removes oxygen from the feedstock, resulting in molecules similar to conventional diesel. Because of its chemical similarity, HVO can be used in diesel engines in up to 100% concentration or be blended with conventional diesel.

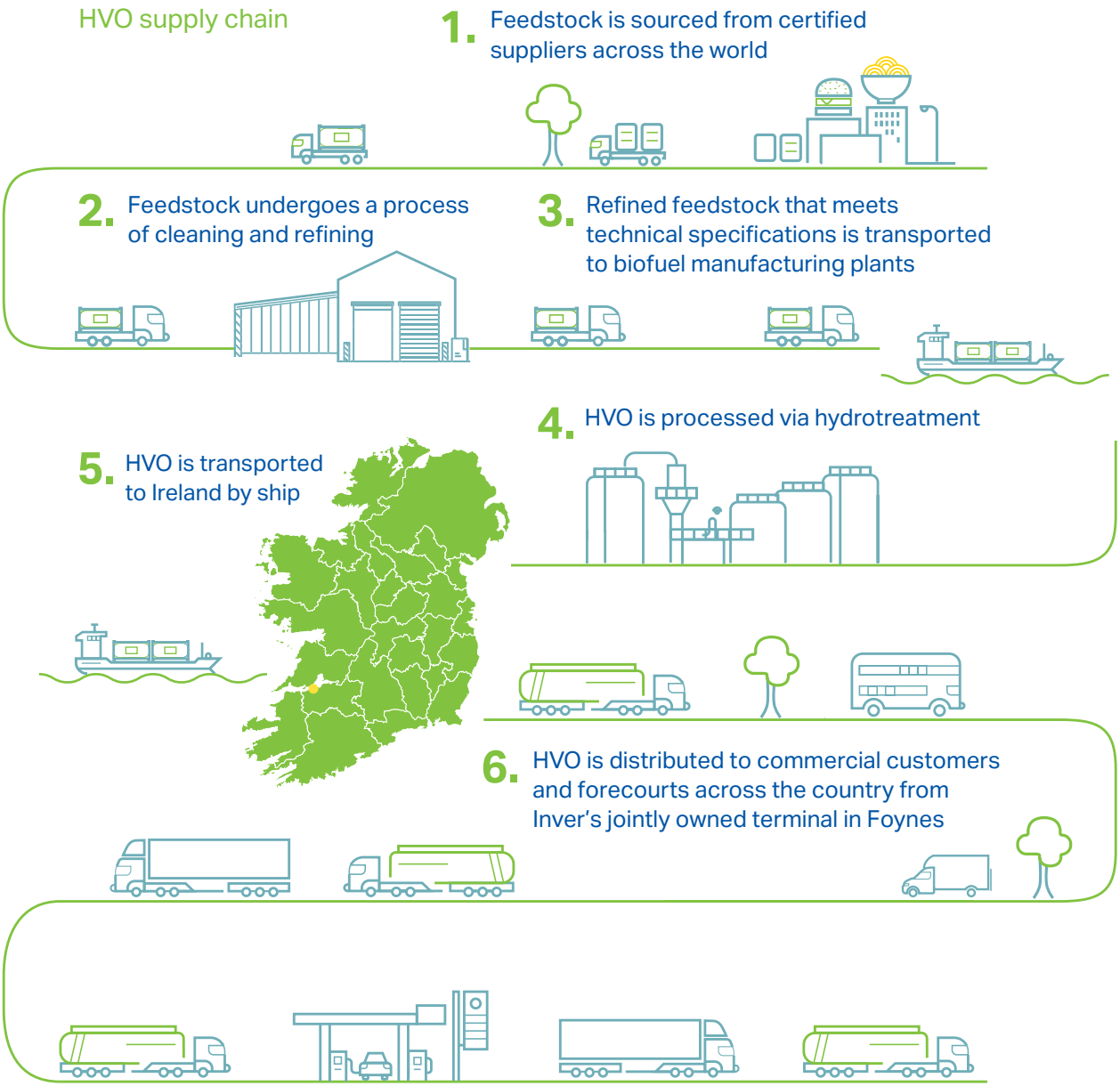
Biodiesel, also known as FAME (Fatty Acid Methyl Ester), is produced through transesterification, a process that treats the feedstock using methanol. Biodiesel can be blended with conventional diesel in different ratios, although higher concentrations may require modifications or extra maintenance to the engine.

Biofuels have been successfully blended into conventional fuels at the pumps for years to help lower transport emissions. They meet stringent safety standards and regulations, ensuring they are safe for use in all compatible vehicles.

We recommend checking with your vehicle manufacturer when considering what is best for your fleet.

How is HVO made?

HVO production involves the sourcing of organic raw materials, such as agricultural residue, non-food crops and waste products. Feedstocks are refined into HVO through a process called hydrotreatment, which involves removing oxygen and splitting the oil molecules. HVO is then distributed to fuel stations or directly to consumers.



How does HVO perform?

HVO meets the EN 15940 specification, the European standard that specifies requirements for paraffinic diesel fuels, ensuring that HVO meets the criteria for cetane number, density, oxidative stability and overall fuel quality.

Combustion Performance

HVO offers cleaner and more efficient combustion due to its high cetane number, which is between 70 and 90[1], compared to 40 to 55 for conventional diesel and 50 to 65 for biodiesel. The higher cetane number helps reduce nitrogen oxide (NOx) emissions and improves cold-start performance.

Cold-Weather Performance

HVO performs well in cold conditions due to its lower cloud point compared to first generation biodiesel made from similar waste oils. This ensures reliable engine operation in low temperatures, improving cold start performance and reducing the risk of fuel waxing.

Energy Content

The energy density of HVO is slightly higher than conventional diesel. While HVO has a slightly lower liquid density (770–790 kg/m^3) than conventional diesel (820–845 kg/m^3), its high cetane number compensates for this difference, ensuring efficient combustion and strong engine performance[2].

Engine Protection

HVO is supplied meeting the same lubricity requirements as EN 590 and ASTM D975, helping to reduce friction and wear in fuel system components. As result, engines run smoothly, with extended lifespan.

Storage Stability

Oxidative stability measures a fuel's shelf life and reaction with oxygen. Fuels that oxidise fast can become thick and sticky, requiring additives to maintain their stability. HVO remains stable over extended periods, offering a longer shelf life, cleaner combustion and reduced risk of fuel system problems[3].

Technical specification of the HVO we supply can be found here:

Inver HVO Renewable Diesel Sales specification

How much does HVO cost?

HVO is an advanced biofuel and can be more expensive than conventional diesel. Like other fuels, pricing is influenced by global market conditions and can vary accordingly. However, HVO is a readily available renewable solution that can lower emissions without requiring modification or significant capital investment in new technology.

Immediate implementation

HVO can be used immediately in existing generators, equipment and engines that run on diesel, without requiring any modifications[1].

Operational continuity

HVO integrates seamlessly into existing operations, eliminating the downtime and expenses associated with adopting new technologies.

Fewer additives needed

HVO's excellent performance in low temperatures reduces the need for seasonal fuel additives. HVO lowers NOx emissions by up to 10%[4], which means less AdBlue is needed compared to conventional diesel.

Long-term savings

Although the upfront cost of HVO per litre can be slightly higher than conventional diesel, the convenience and significant carbon savings make it an attractive option for businesses aiming to reduce their emissions.

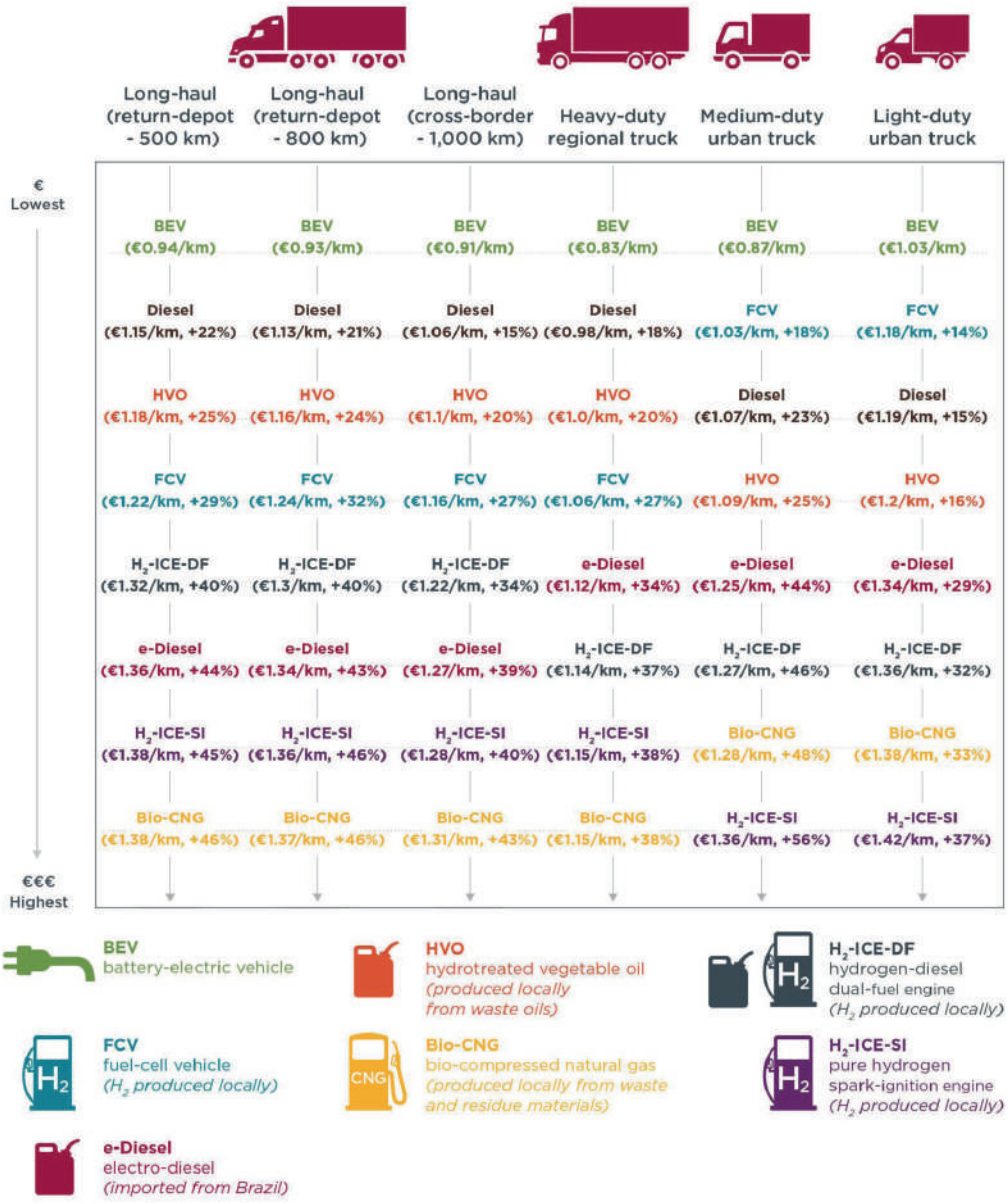
Flexibility

HVO's chemical structure allows it to be used interchangeably or mixed with conventional diesel. Vehicles can switch between HVO and conventional diesel at any time without issues, ensuring flexibility in fuel choices.

Cost comparison

What truck technologies and fuel options cost the least?

Ranking of total cost of ownership for various European truck classes in 2030.



Source: *International Council on Clean Transportation (2023)*
Reproduced in *FTA Ireland Decarbonising the Road Freight Sector - Ireland. (2024)*

Available alternative technologies

PROS AND CONS BY FUEL TYPE						
FUEL TYPE	**B7**	**B20**	**HVO 100**	**BIO CNG / LNG**	**ELECTRICITY**	**HYDROGEN**
Capital costs	No capital cost	No capital cost	No capital cost,	Capital cost for vehicle	Capital cost for vehicle	Capital cost for vehicle
Fuel costs	Base	Premium over diesel	Premium over B100	Fuel Premium over CNG, CNG less expensive	Cheaper fuel	More expensive
Infrastructure	None	None	None	Very expensive Infrastructure	Very expensive Infrastructure	Very expensive Infrastructure
Vehicle availability and compatibility	All EN590 diesel vehicles	Most HGVs - no modification required. Restricted to commercial fleets	Warrantied by leading manufacturers Blend up to 50% to remain with EN 590	Dedicated CNG Vehicles Required	EV, PHEV, mainly limited to smaller vehicle market Better choice but expensive	Compressed H2, Fuel Cell Vehicle – very limited availability
Fuel availability	Available on demand	Available on demand, now in use in Ireland	Available on demand, now Introduced to the market	Limited by infrastructure 4 Fast Fills constructed, more coming. Potential for agri gas production	Available but limited charging network	Certified green available on demand. Large scale green hydrogen available from 2027
Refuelling infrastructure	National retail and wholesale Network	Depot Based - nationwide Can be stored locally	Depot Based - nationwide Can be stored locally Available in retail forecourts	Limited network availability. No LNG infrastructure for transport	Developing charging infrastructure - different capacity/ voltage. Rapid Chargers required. Network capacity restrictive	Refuelling network non existent. 5 years minimum to develop minimal network
Cost	Baseline	Premium over diesel Little to no Capex No vehicles premium	Premium over biodiesel Little to no Capex No vehicles premium	Premium over diesel. Capex for refuelling HGV's infrastructure 10-25k additional per vehicle	Energy is cheaper than diesel when adjusted for efficiency Capex for charging Infrastructure and vehicles required. Cost of electric HGVs is currently higher than diesel equivalents.	Presently sold as an industrial gas Expensive. Large capex required for vehicles and infrastructure

SOURCE: FTA IRELAND

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Decarbonising the Road Freight Sector - Ireland. © FTA Ireland

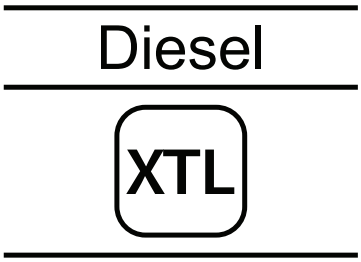
Who can use HVO?

Motorists

Most modern diesel-powered cars are compatible with HVO. Compatibility can be verified by checking the vehicle's owner's manual or fuel cap for the XTL mark, which indicates full suitability for HVO use.

Vehicles displaying the XTL mark can be refilled with HVO at any service station offering it at the pump. HVO availability at forecourts in Ireland is expanding rapidly, making it easier for motorists to start reducing their carbon emissions.

If compatibility is uncertain, consulting the vehicle manufacturer is recommended before making the switch.



Commercial use

HVO has a wide range of Original Equipment Manufacturer (OEM) approvals and can be used to fuel or power a wide range of engines in the commercial sector, including:

- Heavy-duty trucks
- Transit and city buses
- Agricultural and construction machinery like tractors and excavators
- Electricity generation for data centres, events, and standby generators
- Heating boilers.

Most suppliers approve the use of HVO as a direct diesel replacement; however, it is advised to consult the manufacturer before use.

Inver offers flexible HVO supply solutions to meet the unique needs of businesses. HVO can be delivered directly to depots for storage or used to refuel fleets at selected forecourts offering HVO at the pumps.

Find Inver forecourts offering HVO here


This truck runs on
Renewable Diesel
HVO
inver
leading lights
HO
LONG VEHICLE

About Inver

Inver has been operating in the Irish market for over 40 years, supplying a wide range of quality fuels to forecourts and large industrial businesses. Leveraging its existing infrastructure, Inver is focused on expanding lower carbon fuel offerings to help customers reduce their carbon footprint.

International expertise and reliable supply

As part of the Greenergy Group, a leading European manufacturer of waste-based biodiesel and an established supplier and distributor of transportation fuels, Inver benefits from its extensive global expertise. With access to a robust international supply chain, Inver imports HVO through its jointly owned terminal in Foynes and is well-prepared to meet rising demands.

Certified and sustainable supply chains

The HVO supplied by Inver is produced 100% from certified waste-derived and sustainable raw materials, meaning no additional pressure is placed on food crops or agricultural land. Every litre of biofuel supplied by Inver is sourced from auditable and certified supply chains, ensuring that CO_2e reductions from biofuels count towards national carbon reduction targets.

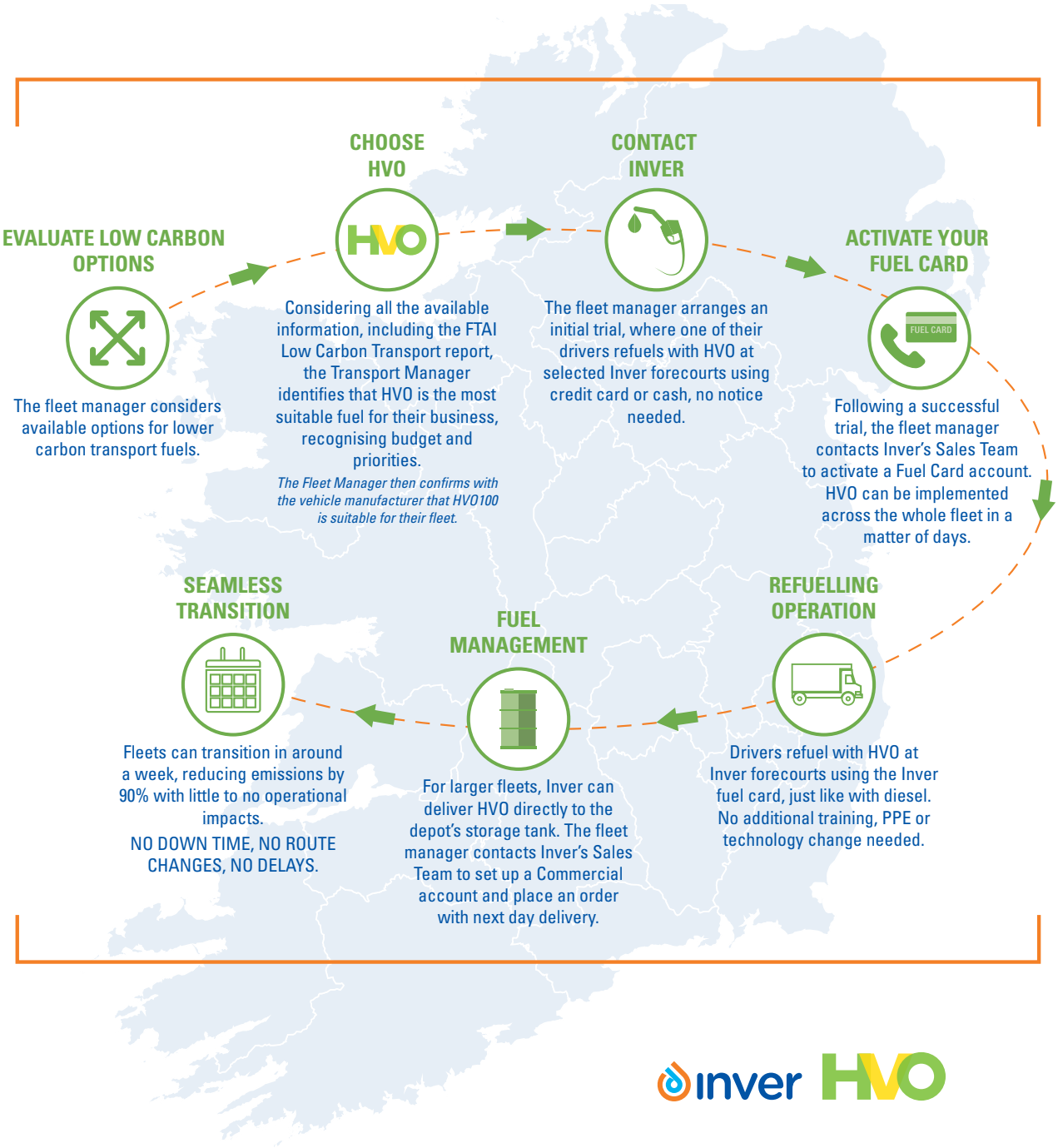
Driving decarbonisation

As businesses are looking to decarbonise, and are increasingly required to report on their carbon emissions and sustainability practices, switching to certified HVO enables you to reduce emissions today, with certification to help your reporting.

Fuel supplied by Inver includes Proof of Sustainability (PoS), which provide auditable documentation on key factors such as GHG savings, feedstock sources, and supply chain traceability, in compliance with CSRD reporting requirements.

Inver HVO adoption journey

Reduce your emissions by up to 90% with HVO compared to conventional diesel. See how simple the transition can be:



Decarbonising our own operation

Committed to reducing its own carbon footprint, Inver started to transition its retail fuel delivery fleet to HVO and high percentage biodiesel blends throughout 2023.

By switching their fleet to lower carbon fuels, Inver has reduced its emissions by 239 tonnes of CO_2e in 2024.

"At Inver, we believe in leading by example and have started transitioning our own fleet to run on HVO.

This aligns with our commitment to decarbonisation and will contribute to significantly reducing our own emissions."

John O'Leary, Managing Director, Inver Energy

Renewable Diesel

References

1 SAE International Journal of Engines. Hydrotreated Vegetable Oil (HVO) as a Renewable Diesel Fuel: Trade-off between NOx, Particulate Emission, Fuel Consumption of a Heavy Duty Engine (2008)

2 Renewable Energy, volume 140. Effect of HVO fuel mixtures on emissions and performance of a passenger car size diesel engine (2019)

3 Fuel Communications, Volume 18. Long-term storage stability of incorporated hydrotreated vegetable oil (HVO) in biodiesel-diesel blends at highland and coastal areas (2024)

4 SAE Technical Papers. Emission Performance of Paraffinic HVO Diesel Fuel in Heavy Duty Vehicles (2011)

5 FTA Ireland. Decarbonising the Road Freight Sector (2024)

Contact us

To start lowering your emissions and find out more about HVO adoption, pricing or certification process, contact our team of experts today.

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