Calling Europe's trucks to BIOFUEL

EU pushes green targets across Member States while associated costs with biofuels rise

ECG Business Intelligence

AUTOMOTIVE FROM ULTIMAMEDIA
Global. Business. Intelligence.

Contents

What are biofuels?

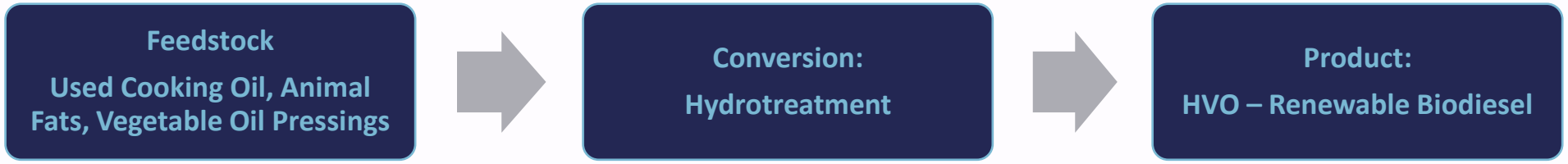
Understanding types of biofuels

Biofuels - What are they?

- Produced from biological raw materials or feedstock such as crops or organic waste.
- Current EU+UK regulations ensure specifications for blends of biofuels & regular fuels for road transport such as E10, B7.
- Considered ‘Sustainable’ as CO_2 produced from burning biofuels is absorbed by the organic matter used to produce them.
- Biofuels achieve green house gas (GHG) savings of 76% compared to fossil fuels.
- Biofuels can be blended with fossil fuels to lower emissions.
  - Low blends of biofuels with fossil fuels do not need vehicle modification.
  - High blends of biofuels with fossil fuels do require specially modified vehicles.
- Heavy goods vehicle (HGV) sector can use biofuels as a stepping-stone to zero emissions, some consider, until electric and hydrogen technologies for the HGV sector are viable.
- Biofuels are therefore considered a ‘stepping-stone’, with significant reductions in GHG emissions, though not yet ‘zero’ emissions.
- Some biofuels (LNG, CNG) require special tanks for storage of the fuel in the vehicle.

Types of biofuels for road transport (1)

Hydrotreated Vegetable Oil (HVO)



- HVO, also referred to as renewable diesel, is a hydrocarbon fuel chemically similar to standard diesel and thus often considered a direct replacement or a 'drop-in fuel'. This means that the vehicle would not need to be modified for moving to HVO, and also highlights that the vehicle is compatible with both fuels. So, if HVO is unavailable the heavy goods vehicle could switch to diesel and vice versa.
- HVO is produced by using hydrogen to remove oxygen from waste vegetable oils and fats.
- HVO use has no impact on vehicle warranty or maintenance.
- HVO is currently not publicly available in fuel stations.
- HVO is used by commercial fleets in 'bunkered' fuel supplies.

Types of biofuels for road transport (2)

Biomethane

- Biomethane is a gaseous biofuel consisting mainly of methane. It is considered a sustainable version of natural gas and can be used as a drop-in fuel replacement for fossil derived natural gas such as diesel, and in some markets even petrol.
- Biomethane is produced by the anaerobic digestion, a biochemical process when biomass is broken down by micro-organisms in the absence of oxygen, of food waste and animal manure.
- Biomethane can be stored in pressurised cylinders at 200 to 250 bar as Compressed Natural Gas (CNG).
- Biomethane can be stored in cryogenic tanks at -160 Celsius as Liquified Natural Gas (LNG).
- **LNG** considered to offer greater energy storage capacity and operating range for a given tank volume.
- **CNG** considered easier to refuel.
- Biomethane fuel costs lower than diesel on a per mile basis.

Types of biofuels for road transport (3)

Bioethanol

- Bioethanol is an ‘alcohol’ fuel produced from the fermentation of sugar and starch crops. It can be blended with standard petrol but has a 30% lower energy content than petrol, thus resulting in higher fuel consumption in higher blends of bioethanol.
- Bioethanol can be used in a ‘spark ignition’ engine, such as a petrol engine.
- Ethanol blends up to E10 can be used in current, modern petrol ICE engines without modification for PV and LCV vehicles.
- Higher ethanol blends do, however, require modified engines and fuel systems.
- Flexible fuel vehicles, that is those vehicles with compatible fuel systems, have been used in some countries (US and Brazil), where ethanol blends of up to E85 are used.
- GHG emission reductions limited by the ‘blend wall’ –the amount of ethanol that can be blended into petrol. Also a cost incurred will be the *change of land use* to produce crops for ethanol production.

Types of biofuels for road transport (4)

FAME* Biodiesel

- FAME biodiesel is produced using a process called transesterification where waste products such as used cooking oil are blended with diesel, producing a fuel with slightly lower energy content than regular diesel.
- FAME Biodiesel blends up to B7 can be used in compression ignition engines, i.e. diesel engines, without modifications.
- High blend FAME biodiesel is currently not available in public fuel stations, but typically used by commercial fleets in 'bunkered' fuel supplies
- Many heavy goods vehicle (HGV) manufacturers warranty new vehicles for blends of B20 and B30, with some also warranting up to B100 but the highest blends require modification of vehicle fuel systems such as heated fuel lines and insulated fuel tanks.
- Use of high blends of FAME biodiesel results in 'marginal' increase of running costs such as increased maintenance costs.

*FAME – Fatty Acid Methyl Ester

Summary: Types of Biofuels for Road Transport

Biofuels & Blends	Full Name & Details	Does ICE Engine Need to be Modified	Available in Public Fuel Stations	Available for Commercial Fleets from bunkered supply
HVO	Hydrotreated Vegetable Oil	No	No	Yes
LNG	Liquified Natural Gas is Biomethane stored at -160 Celsius	No, but special tank needed	Some	Some
CNG	Compressed Natural Gas is Biomethane stored in pressurised cylinders at 200 to 250 bar.	No, but special tank needed	Some	Some
E10	Ethanol blend used for ICE petrol vehicles	No	Yes	Yes
E85	Ethanol blend at top end compatible with ICE engines without modification	No	Some	Yes
B7	FAME Biodiesel blend compatible with regular diesel ICE engines	No	Yes	Yes
B20	FAME biodiesel blend for Heavy Goods Vehicles (HGV)	No	Some	Yes
B30	FAME biodiesel blend for HGVs	Some	Some	Yes
B100	FAME biodiesel blend for HGVs	Yes	Some	Yes

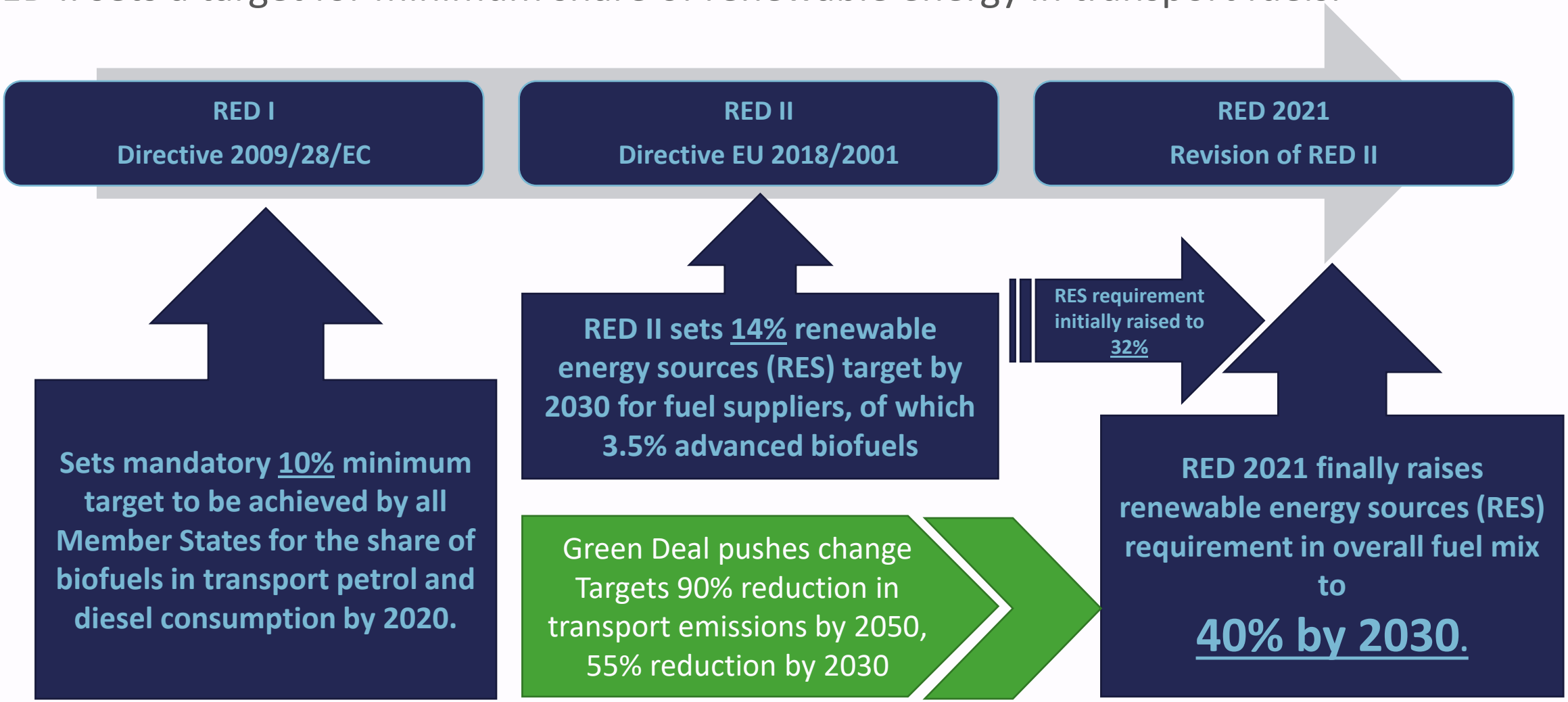
02

Renewable Energy Directive (RED)

Pushing fuel suppliers to offer fuel from renewable energy sources (RES) under the Fuel Quality Directive (FQD)

Renewable Energy Directive (RED)

RED II sets a target for minimum share of renewable energy in transport fuels.



Fuel Quality Directive (FQD)

- FQD sets a reduction target for the average GHG intensity of fuels.
- FQD also lays down fuel specifications determining how much biofuel can be blended with regular road transport fuels.
- Biofuel blends not meeting the fuel specifications for regular road transport fuels, such as so-called 'high blends', must be marketed as a different product.
- Fuel specifications (and vehicle compatibility) are issues both of the FQD and provisions for the Alternative Fuel Infrastructure Directive (AFID).
- **GHG reduction targets for transport fuels**: Apart from Spain, which has not fully transposed the FQD, all Member States and the UK have transposed a target for the reduction of the GHG intensity of fuel originally set for 2020 and now extended. This target is set at **6%**, except in France and Portugal where it is set at 10% and in Sweden, where the obligation is differentiated in petrol (4.2%) and diesel (21%).

6% reduction target for GHG emissions in transport fuel across EU extended

UK – Renewable Transport Fuel Obligation (RTFO) : Sets UK in line with EU's RED regulation

- Fossil fuel suppliers have an obligation to supply a certain percentage of their fuel as biofuel. They demonstrate this by either redeeming Renewable Transport Fuel Certificates (RTFCs) or paying a buy out price. You can find the buy-out price in the RTFO.
- Suppliers of biofuels in the UK can apply to the Department for Transport (DfT) to receive one RTFC for every litre of liquid biofuel or kilogram of biogas they supply. These certificates can be:
  - traded (providing a potential revenue stream to biofuel suppliers)
  - used by fossil fuel suppliers to meet their obligation

03

Emission standards for HDVs

EU wide regulation on CO_2 emission targets to be updated Q4 2022

Emission Standards for heavy duty vehicles (HDV)

- First EU wide CO_2 regulation for HDVs introduced August 2019
- Sets a 15% CO_2 emission reduction requirement for new HDVs for 2025-2029, and 30% reduction for year 2030 and beyond
- Large lorries affected by regulation

- Other vehicle types such as smaller lorries, buses, coaches and trailers expected to be added to Regulation
- 2030 benchmark level to be set
- CO_2 standards assessment to be addressed. Possible lifecycle CO_2 emissions and CO_2 credits for manufacturers

UK: Although the UK has left the EU, Regulation EU 2019/1242 has been copied into UK law, with Dept of Transport reserving right for amendments

Regulation EU 2019/1242 Incentives and Credits

Super Credits System

- Applies from 2019 – 2024, and can be used to comply with target in 2025. A multiplier of 2 applies for ZEV and a multiplier of 1 and 2 applies for LEV depending on CO_2 emissions. An overall cap of 3% is set for this system.
- From 2025 a new benchmark based crediting system will be set at 2%. The 2030 benchmark level will be set in the 2022 Review.

Bankable Credits

- 2025 targets: a manufacturer whose average specific CO_2 emissions are below the CO_2 emissions reduction trajectory defined by the reference CO_2 emissions and the 2025 CO_2 emissions target can bank emission credits.
- 2030 targets: a manufacturer whose average specific CO_2 emissions are below the CO_2 emissions reduction trajectory between the 2025 target and the target applicable from 2030 onwards, should be able to bank those emission credits for the purpose of compliance with the CO_2 emissions targets from 1 July 2025 to 30 June 2030.

Zero Emission Vehicles (ZEV): lorries with NO tailpipe emissions.
Low Emission Vehicles (LEV): lorries with permissible max laden mass 16t, and CO_2 emissions of less than half of the average CO_2 emissions of all vehicles in its group registered in the 2019 reporting period.

04

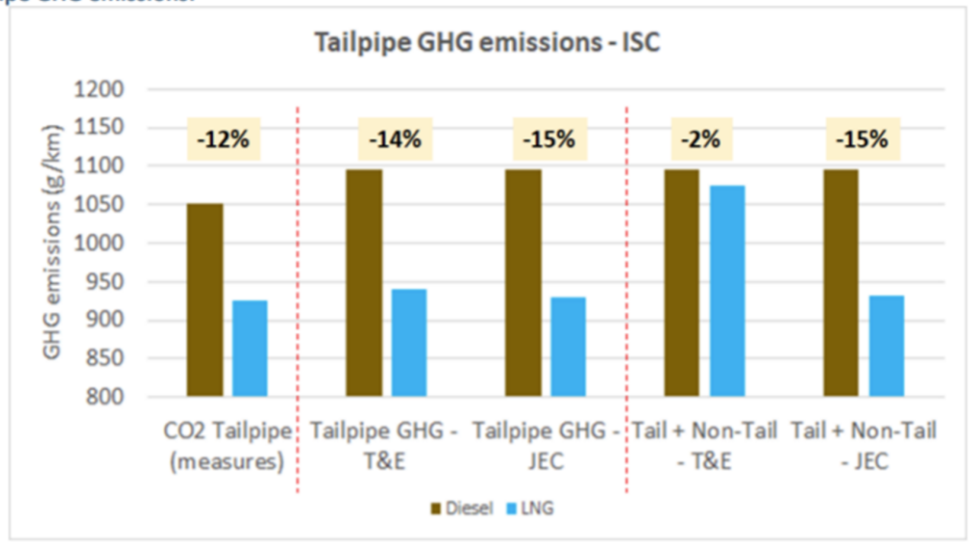
The case for biofuels in road transport

For & against biofuels; choosing from what's on offer

Industry At Odds: For Biofuels

- Natural & Bio Gas Vehicle Association (NGVA) – **FOR**
  - Running HDVs on renewable methane delivers strong GHG reductions
  - Case of sustainably produced methane, e.g. from straw or manure, negative GHG values can be achieved on the WtT (Well to tank), with up to -533gCO_2e/MJ*, dependant on feedstock used
  - GWP index: this factor converts CH_4 and N_20 as CO_2 equivalent, looking at two potential timeframes, 20 years, and 100 years. GHG emissions need to be assessed over the long-term period of 100 years, also considering that CH_4 has a time life of about 12 years before being converted to CO_2.
  - Disputes tailpipe emission results from Transport & Environment study, highlights results from the Joint Research Centre of the European Commission methodology.

Tailpipe GHG emissions:

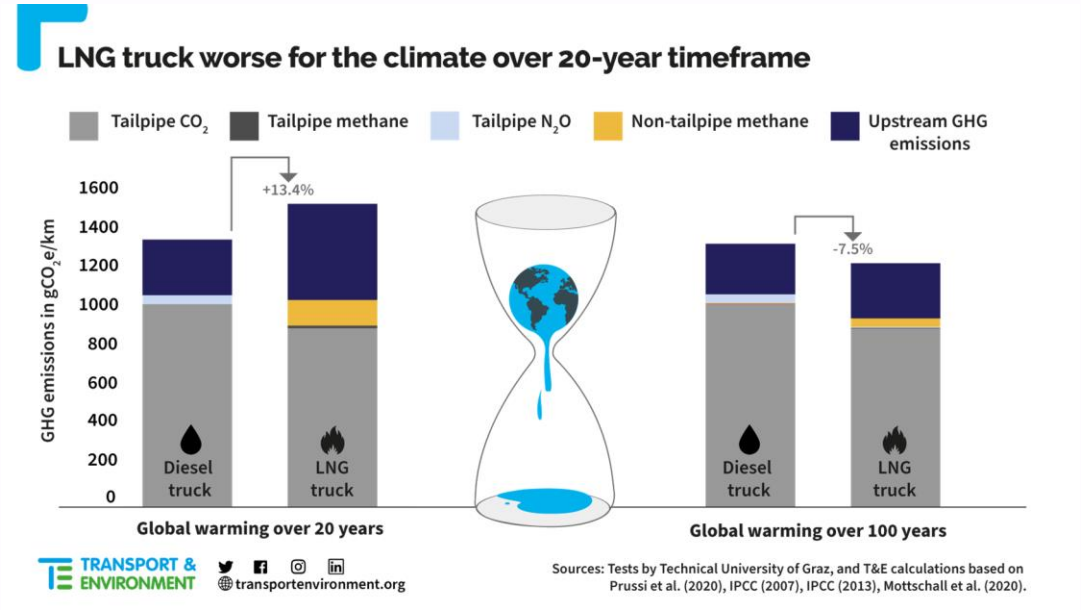


* g$C0_2$eMJ – Grams of Carbon Dioxide equivalent per megajoule of energy – the measure of green house gas (GHG) emissions from the complete life cycle assessment (LCA) of a fuel

Industry At Odds: Against Biofuels

- Transport & Environment (T&E)-- **AGAINST**

- Over a 100 year global warming potential (GWP) an LNG truck achieved 7.5% GHG reduction compared to a diesel truck.
- Over a 20 year GWP period , an LNG truck had higher GHG emissions (of 13.4%) than a diesel truck.
- Study claims particulate matter (PM) emissions higher from LNG trucks than diesel trucks.
- Study claims overall NO_X emissions were reduced compared to diesel trucks, but in urban areas close to legal limits.
- Claims biomethane not sufficiently scalable or viable for decarbonising truck sector.



Better over 100 year timeframe!

IVECO: Stralis Natural Power

- **Stralis NP** is the full range of Iveco's heavy trucks fuelled by Natural Gas.
- Iveco's line of Stralis NP trucks use Natural Gas and biomethane as the sustainable fuel of the future.
- Stralis NP offers the opportunity to improve both sustainability and return on investment – with a total cost of ownership (TCO) up to 9% lower than diesel trucks.
- Iveco states its Stralis NP line delivers:
  - Up to a 15% improvement in fuel consumption versus equivalent diesel trucks
  - Natural Gas is cheaper than diesel in most European countries
  - No gas oil use at all – that is no diesel or petrol used
  - A long maintenance interval of 90,000 km

Scania: Gas Truck

- **Scania Gas Truck** range of gas-powered trucks offer a range of up to 1,700km with great drivability, low fuel consumption.
- Noise pollution is reduced too, as these gas engines run quieter than their diesel counterparts - with the 13-litre engine meeting the PIEK noise limitation standard, which certifies under 60dB(A) at 7.5 meters from sound source.
- Whether using CNG/CBG or LNG/LBG, the fuel used is ultimately methane gas, so natural gas or biogas can be used interchangeably. LNG offers higher energy density than CNG, making it the preferred option for longer distance transport.
- Natural Gas CNG/LNG can reduce CO_2 emissions by 15-20%, and Biogas CNG/LNG by an incredible 90%.

Mercedes-Benz: Actros Natural Gas Technology

- Mercedes' new **Actros NGT**
  - Available in versions of 18 or 26 tonnes.
  - 100% CNG range runs up to 650 km.
  - Up to 95 % fewer CO_2 emissions with biogas.
  - Significantly lower noise than from the regular diesel engine.
  - Allison automatic transmission.

- Environmentally friendly: Helps reduce smog.
- Safe: Refuelling is just as easy as with other, traditional fuels.
- Economical: Low costs for CNG throughout Europe + state subsidies in many countries mean the operating costs are lower than for diesel engines.
- Convenient: Refuelling is quick; network of filling stations for CNG is the most developed in the whole of Europe. CNG vehicles are often exempted from traffic restrictions.

Volvo Gas Trucks: FH LNG, FM LNG & FE CNG

- For long haul transport: **Volvo FH LNG** is a powertrain based on the automakers diesel engine technology. But here instead of just diesel, the truck runs on LNG and a small of amount diesel or HVO to ignite the gas. This reduces the overall CO_2 footprint and offers the opportunity for lower fuel costs, since LNG is cheaper.
- For regional transport: **Volvo FM LNG** is gas-powered and has a powertrain based on Volvo's diesel engine technology. It uses LNG and a small share of diesel. This reduces the CO_2 footprint and offers the opportunity for lower fuel costs, since LNG is cheaper. This truck has been optimized for regional transport.
- For urban distribution transports and waste collection: **Volvo FE CNG** runs on CNG only (either natural gas or biogas) which reduces emissions of CO_2. At the same time, it's just as productive and efficient as the diesel-powered Volvo FE. This line has been built purely for urban distribution.

05

Cost Comparison

Comparing costs of filling up with biofuels

UK

Daily Fuel Price (27.01.22)	Petrol	Diesel
Pump price (pence per litre)	146.06p	149.42p
Wholesale fossil fuel	43.75p	43.8p
Wholesale biofuel price	8.35p	13.37p
Delivery & Distribution	1.7p	2.1p
Retail margin (forecourt)	9.31p	6.62p
Duty	57.95p	57.95p
VAT (Petrol 20%, Diesel 20%)	24.34p	24.9p
GHG Obligation & Development Fuel Obligation	0.654p	0.676p
Percentage of pump price that is Duty, VAT, Environmental Tax	56.79%	55.9%

Source: RAC

- Standard Petrol (E10) contains a biofuel component of up to 10%
- Diesel (B7) has a biofuel component of up to 7%

Example:
To Calculate Diesel Price at Pump:

= 43.8 + 13.37 + 2.1 + 6.62 + 57.95 +24.9 + 0.676
=**149.416p price per litre Diesel at pump**

Current Biodiesel price per litre: 114.05p (see next slide)
To calculate Biodiesel Price at Pump:
=149.416p + 2.1p + 6.62p + Duty
=**158.136p + Excise Duty per litre Biodiesel**

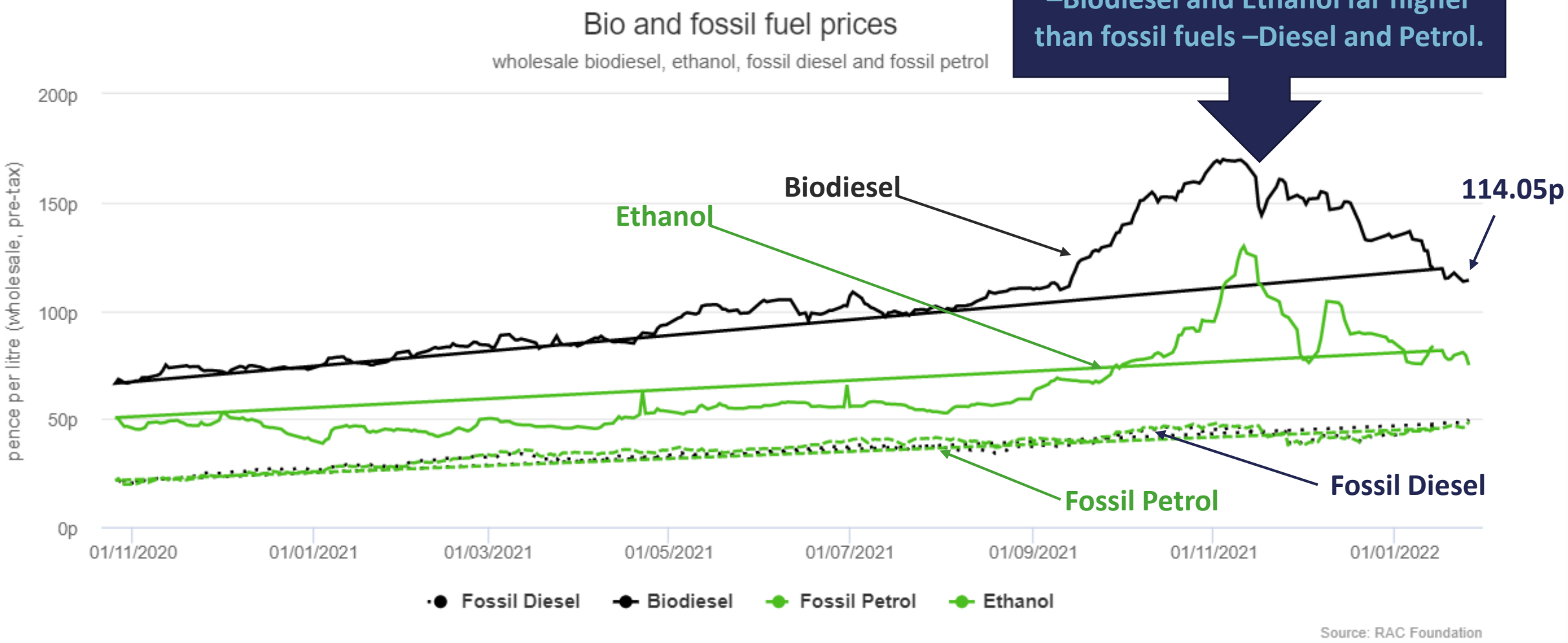
Cost benefit not main factor to switch to biofuel; ethical & regulatory push biofuels switch

Taxes, duties, pump prices and wholesale prices are latest data as of 2022-01-26. Last updated: 2022-01-27 11:01:43 (GMT)

All prices used here are as of the pump price date. Retailers buy the fuel they sell at a range of dates (and therefore, prices) prior to the date of sale to motorists. As a result, the component prices shown here should be treated only as indicative of the national market, and not an account of any specific retailer's costs or profits.

*Petrol and Diesel have different densities therefore conversion factors are used to change fuel prices in tonnes to fuel price in litres. There may be some anomalies due to rounding errors.

Current wholesale prices of biofuels –Biodiesel and Ethanol far higher than fossil fuels –Diesel and Petrol.



From a cost analysis of filling at a pump, biofuels do not win. But the equation is more complicated as companies seek ethical, sustainable solutions and regulations push for reduction in emissions.

Green credentials not cost lure players to biofuels

RAC Foundation

Philip Gomm, head of communications, RAC Foundation

"As you say, biofuels are more expensive than their fossil fuel equivalents, so they add a disproportionate amount to the pump price when they are blended. It would appear that their increasing use would push up the fuel bills of users."

LOGISTICS UK

Large scale technology trials must result in clarity and certainty for HGV operators on which zero tailpipe emission technologies will be commercially viable, enabling long-term business planning. Route to Net Zero

Biofuels crucial to meet green targets, despite high costs

Biodiesel prices moved to new highs in 2021

Prices reached records across all northwest European biodiesel grades in 2021, as several long-term and temporary factors combined to form a perfect storm.

argus

Commodities 2021: Climate change policy targets to stimulate EU biodiesel consumption

S&P Global Platts

OCT 14, 2021

Drive to greater biofuel usage hampered by high costs and lack of feedstock availability, WEO report reveals

biofuels international

Renewables Growth Prompts a Feedstock Demand Surge

REUTERS

Biofuels demand set to grow despite high costs: IEA

01 December 2021

argus

Consumers to be cushioned from price impact of biofuel blending until next autumn

Thu, Nov 25, 2021, 18:30

THE IRISH TIMES

Fit for 55 needs a biofuels boost

ePURE european renewable ethanol

SEP 21, 2021

Calls to diversify and decarbonise energy mix as gas prices spike

biofuels international

Demand for biofuels is increasing global food prices, says study

the Guardian

LNG vs Diesel (example Spain)

- Cost of new Diesel Truck = Euros 80,000
- Truck consumes 30 litres diesel per 100km
- Price of diesel Euro 1.15 per litre
- Truck estimated to cover 110,000 km per annum
- Analysis estimated a 15 year period

- Cost of new LNG Truck = Euros 108,000
- Truck consumes 25 kg of LPG per 100km
- Price of LNG Euro 0.28 per kg wholesale
- 30-35% of retail fuel price is wholesale price*
- Price of LNG as a fuel is Euro 0.84 per kg
- Truck estimated to cover 110,000 km per annum

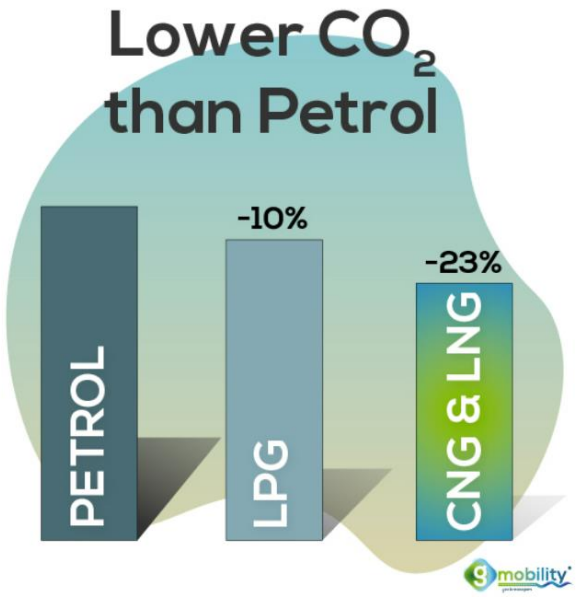
Fuel Type	Fuel Cost	Maintenance Cost	Total
LNG	Euro 23,100	Euro 11,484	Euro 34,584
Diesel	Euro 37,950	Euro 9,570	Euro 47,520

Over 15 years, the LNG truck would have saved around Euro 138,000 and would become more cost effective after 2.16 years

* Source: Energies Study Fuel Switch to LNG in Heavy Truck Traffic

Higher Upfront Costs for LNG trucks, but are they worth it?

- Purchase of an LNG truck generally 22% higher than diesel truck*
- Running cost of LNG truck about 40% lower than diesel truck
- Emissions from LNG truck 25% lower than diesel



- LNG has a roughly 25% lower carbon content than diesel but over a 100 year period only benefit 2% better than diesel engine while in a 20 year time frame overall GHG emissions are worse**
  - Emissions certification neglects methane and nitrous oxide
- But increased use of LNG trucks in Europe mean that Europe's gas supply could be transformed into a fully renewable resource.
- LNG trucks are expensive technology
- Biogas will ONLY deliver GHG benefits if produced from low-carbon feedstocks but:
  - Not enough cow manure, garbage, agricultural waste to produce adequate LNG

* NGVA study: LNG trucks offer solutions for heavy loads and long distances

** ICCT study: LNG Trucks- A bridge to nowhere

Subsidies for LNG & CNG in road transport: Germany

- Germany: LNG & CNG trucks subsidized at purchase, exempt from road tolls, pay 70% less fuel energy tax than diesel trucks
  - In a 5 year period, subsidies in Germany amount to Euro 70,000 per LNG truck
  - Since 1 January 2019: LNG & CNG trucks exempted from road tolls. To be extended to 31 Dec, 2023.
  - Purchase of LNG & CNG trucks subsidized by Euros 12,000.
- Increase in purchase of CNG & LNG trucks following introduction of subsidies:
  - 1,421 applications for LNG trucks in 2020*, and more than 430 CNG vehicles registered
  - Natural gas trucks registered a growth of more than 80% compared to the previous year.
  - New registrations also increased dramatically for vehicles over 12 tons, by 31%.

"Currently, CNG and, in particular, LNG trucks are the only alternatives to diesel in heavy long-distance transport," German Energy Agency - Deutsche Energie-Agentur (dena)

*source: Federal Motor Transportation Authority

06

Targets & Talking to the Industry

FQD requirements by EU Member States, comments from fuel suppliers & OEMs

EU pushes to meet 2020 target, 6% reduction

2021 Update!

- To support a reduction in GHG emissions from transport, the **Fuel Quality Directive (FQD)** sets the target that fuel suppliers should reduce the emission intensity of fuels sold in the EU by 6% by 2020, compared with 2010.
- In 2018, the average emission intensity of fuels in the EU was 3.7% lower than in 2010, and in 2019, a 4.3% reduction had been achieved. Despite the improvement, as of 2019, the EU was not on track to meet its 2020 target.
- Progress towards meeting the **6% reduction** target by 2020 had varied widely across Member States. In 2019, Finland and Sweden had exceeded this target and the Netherlands was close to reaching it (5.8% reduction). This is because their road transport fuel mixes have relatively high proportions of biofuels (9% in Finland, 7% in the Netherlands and 22% in Sweden) and, on average, the biofuels used have relatively low emission intensities (10.4 gCO_2e/MJ, 15.2 gCO_2e/MJ and 14.1g CO_2e/MJ, respectively).
- The three Member States that reduced their emission intensities the least between 2010 and 2019, namely Cyprus (1.4%), Latvia (1.8%) and Estonia (1.8%), use fuel mixes with much lower proportions of biofuels (1.7% in Cyprus, 2.6% in Latvia and 2.8% in Estonia) and, in the case of Latvia, the biofuels used have much higher emission intensities (32 gCO_2e/MJ).

$gC0_2eMJ$ – Grams of Carbon Dioxide equivalent per megajoule of energy.

Member States + UK 2021 Targets of Biofuels in Road Transport

Country	Overall % (energy content, % cal)	Biodiesel (% cal) in Diesel	Bioethanol (% cal) in Petrol	GHG Emission Reduction (%)	Fine/Penalty
Austria	5.75	6.3	3.4	-6	Austrian Fuels Order 2012, (amendment 2020).
Belgium	-	9.55	9.55	-6	€900/1,000 litres of missing biofuels, with a maximum of €10,000, can be doubled.
Bulgaria	-	6	9	-6	Bulgarian Renewable Energy Law and enforced since April 1, 2019.
Croatia	8.81	7.49	1.00	-6	Act on Biofuels for Transport, Croatia March 2021
Czech Republic	6	6	4.41	-6	Biofuel: 40 CZK per litre of biofuel that was not supplied GHG: 10 CZK per kg CO_2 eq reduction not achieved
Denmark	7.6	-	-	-6	General obligation of blending biofuels with fossil fuels at 5.75
Finland	20			-6	€0.04 per MJ (≈€1,675/toe) of missing biofuel Advanced biofuels: €0.03/MJ (≈1,260/toe) of missing advanced biofuel
France	8.6	2.8	3.8	-10	
Germany	-	-	-	-6	0.47 Euro per kg CO2 eq under allocated reduction
Greece	10	7.0	3.3	-6	
Hungary	8.2	8.2	6.1	-6	HUF 100,000 if GHG 0-4%, HUF 10,000 if GHG 4-6%
Ireland	12.359	11	11	-6	
Italy	10			-6	Fuels suppliers not complying with 95% of the renewable mandates pay a penalty of €750 per missing certificate.
Netherlands	17.5			-6	Fuel suppliers failing to fulfil the quota obligation can be brought to court for committing an economic violation
Poland	8.7			-6	
Portugal	11			-10	€2,000 per TdB (título de biocombustíveis, equals a Ktoe) that the obliged party fails to meet
Romania	10	6.5	8.0	-6	RON 70,000-100,000 (approx. USD 17,500-25,000)
Slovakia	8.0	6.9	9	-6	
Slovenia	10.0			-6	Regulation on Renewable Energy Sources in Transport update 2021 (Uredba o obnovljivih virih energije v prometu)
Spain	9.5			-6	€763 per missed certificate (each certificate equals one Ktoe.)
Sweden				-6 petrol, -26 diesel	Fuel suppliers failing to meet the GHG obligations pay a penalty per kgCO_2eq of €0.48 for petrol & €0.39 for diesel.
UK	10.679	-	-	-	The roll-out of E10 started September 2021. In practice, the incorporation rate will likely be around 7- 8% initially

Talking to NESTE

- Q: From a cost analysis there is currently no biofuel that is cheaper than regular diesel? So what is the draw for stakeholders to switch from the cheaper alternative to a biofuel?

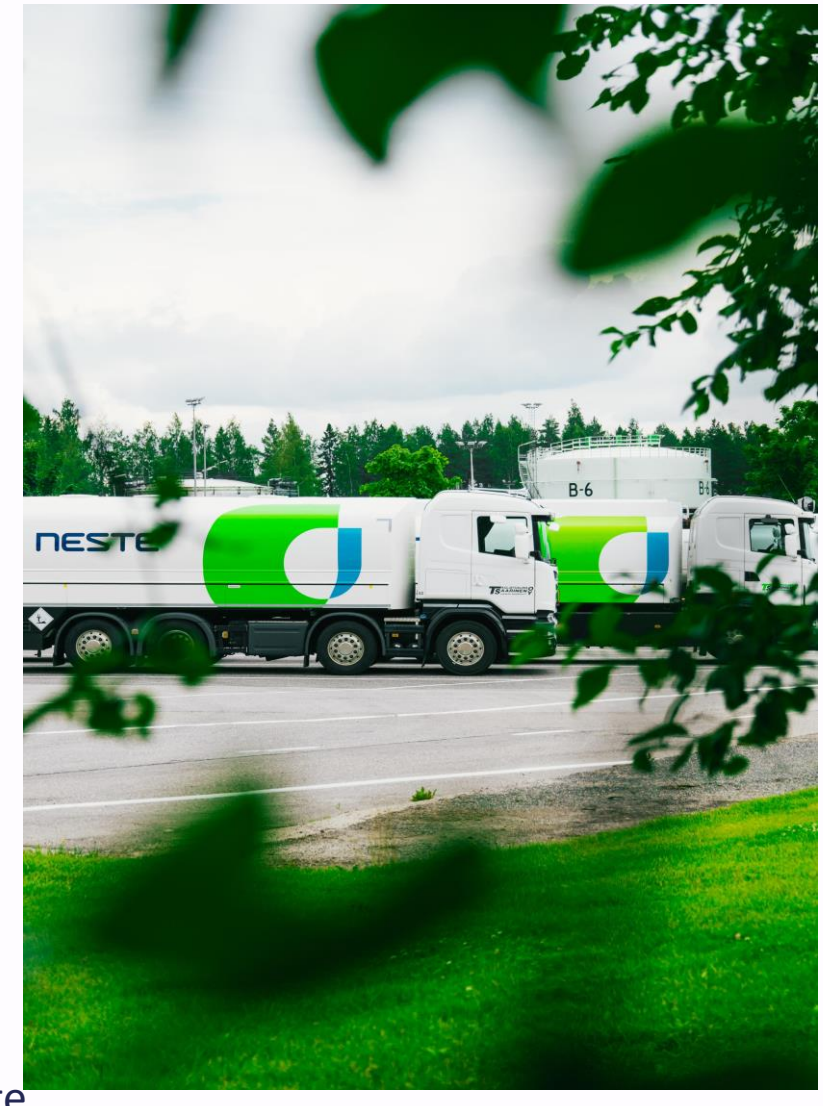
  "To create a better world on local and CO_2-emissions, but also because they will get more work because the big corporations are obligating their logistic partners to become more sustainable."

- Q: Do you see regulations as the main reason why fleet owners will choose to switch to a biofuel or is it green credentials?

  "Most of the time (especially when we enter a young market for biofuels) most companies need to have some kind of obligation and incentive to become more sustainable. Regulations are a big driver in this."

- Q:Could you explain any monetary gains to be made if haulage companies switch to fleets fuelled by a biofuel?

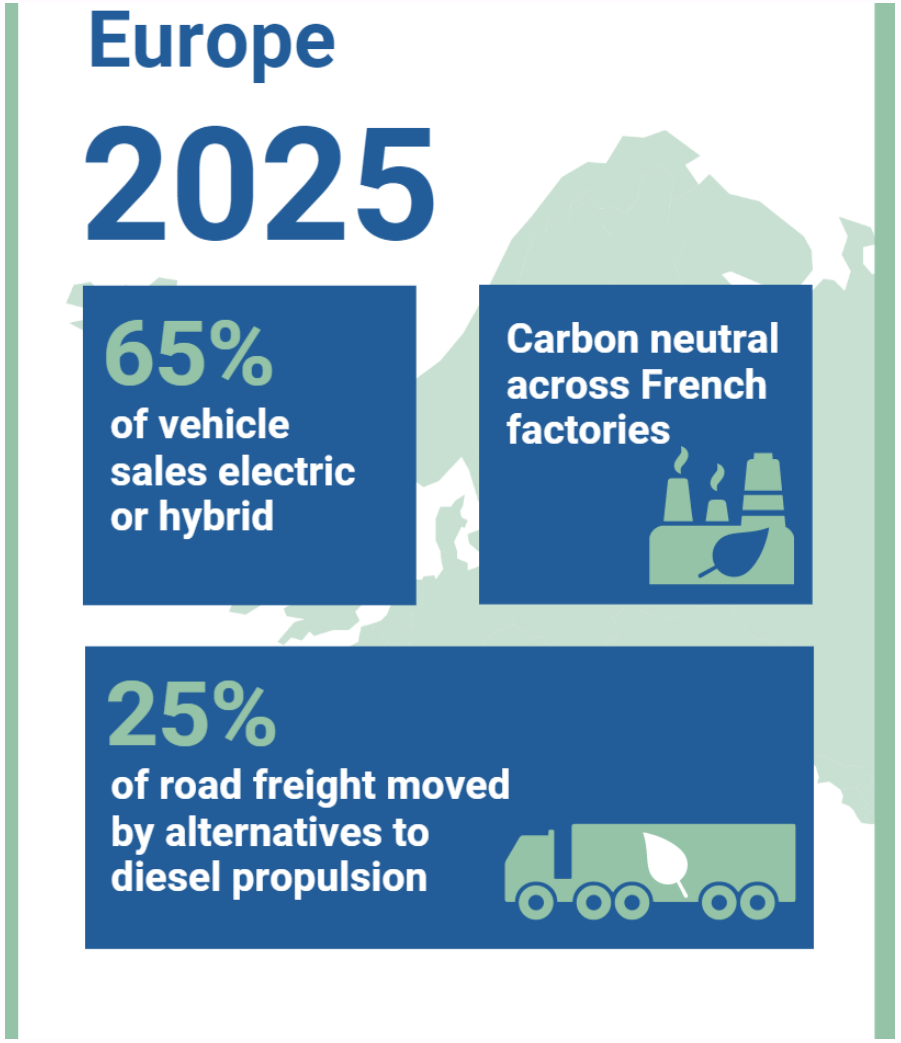
  "**Incentives need to be in place to make the price attractive for haulage companies. This is different per country in the EU. But as mentioned, big corporates are requesting this more and more and are willing to pay for it."**



Source: Neste

Talking to Renault

- Renault has been active in transitioning to freight flows that use alternative fuels, especially to diesel. **By 2025, the carmaker aims for 25% of road freight to move on trucks using alternatives to diesel.**
- The carmaker is focusing initially on **biogas**; together with partners, it has established a small fleet and aims to have **15 trucks running by the end of 2021, which will be in addition to 12 LNG trucks**, between suppliers and French plants.
- **"This is quite modest, but we are pushing hard to develop biogas with our logistics partners, as it is the most virtuous and accessible of current fuel alternatives to limit emissions," said Jean-François Salles, Renault Group global vice-president for supply chain in discussion with Ultima Media.**
- Renault will aim for zero emissions in logistics by 2040 in Europe, with an interim goal of reducing emissions by 30% by 2030**.**



Source: Automotive LOGISTICS

Talking to Shell

Patrick Carre, Vice President Global Commercial Road Transport, Shell

“Last week in Cologne - Godorf, we launched the construction of what will be the largest BioLNG plant in Germany. This site will allow for an annual capacity of 100K tons of BioLNG. By Autumn 2023, we aim to offer a carbon neutral fuel to all our customers who refuel at any Shell LNG sites in Germany.

We achieved another exciting milestone in the Netherlands today, and I’m thrilled to share that Shell is now the first to offer a blend of BioLNG to the entire Dutch network, where customers can get approximately 30% in CO_2e savings.”

16/02/2022

Source: Shell

07

Conclusion

Despite high costs, biofuel growth to rise to meet green targets

Green targets take priority over higher costs

- European biofuel markets will see record surge in demand as EU policy pushes for GHG reductions in fuel used in road transport, with penalties for fuel suppliers and governments at national levels that do not adhere to FQD & RED regulations.
- Estimates show that the biofuel market for road transport is expected to rise 5.5% CAGR* over the 2022-2027 timeframe, although COVID-19 bottlenecks have countered the rate of growth due to:
  - High logistics costs due to Covid-19 supply chain issues, thin supply due to stop-start production, protectionist quotas on biofuel exports, lack of stockpiles, force majeures issued by German chemical producers caused lack of catalyst supply affecting overall biodiesel production in the EU.
- Despite high costs associated with biofuels, the push for green credentials and national targets see move to greater supply of biofuels across EU. With government subsidies in place, HDVs can currently benefit from moving to biofuels such as LNG.

* Mordor: Europe Biofuel Market 2022-2027, Argus: Biodiesel study

Governments, Fuel Suppliers, Automakers & Logistics Companies move to meet green targets

- Countries such as Sweden, Netherlands, UK, Germany push bio-diesel blending
- Germany continues to be largest producer and consumer of biofuels in Europe.
- EU mandates for 2020 now pushed for 2021, across Member States (+UK) pushing for GHG reductions of 6%, enhanced mix of biofuels in petrol and diesel offering at pumps.
- Road transport operators will need to monitor changes to Fuel Quality Directives, currently no engine modifications needed.
- Road transport operators, fuel suppliers, and Member States push pilot projects with higher biofuel mixes.
- OEMs pushing to reduce carbon footprint in vehicle and component logistics and across supply chains in bid to meet internal climate neutral targets.

08

Glossary

Glossary

- HVO – Hydrotreated Vegetable Oil
- GHG - Green House Gases
- HGV - Heavy Goods Vehicle
- LNG - Liquified Natural Gas
- CNG- Compressed Natural Gas
- Blend Wall - amount of ethanol that can be blended into petrol
- LULUCF - Land Use, Land Use Change & Forestry
- FAME - Fatty Acid Methyl Ester
- RED – Renewable Energy Directive
- RES – Renewable Energy Sources
- FQD – Fuel Quality Directive
- AFID – Alternative Fuel Infrastructure Directive
- RTFC - Renewable Transport Fuel Certificates (UK)
- RTFO - Renewable Transport Fuel Obligation (UK)
- ZEV – Zero Emission Vehicles
- LEV – Low Emission Vehicles
- ZLEV – Zero & Low Emission Vehicles
- $gC0_2eMJ$ – Grams of Carbon Dioxide equivalent per megajoule of energy - It is a measure of the GHG emissions from the complete life cycle assessment (LCA) of a fuel
- LCA – Life Cycle Assessment
- WtW – Well to Wheel –LCA from extraction of raw materials to use in vehicle; equivalent to combined WtT + TtW
- WtT – Well to Tank – LCA Phase of fuel production process
- TtW –Tank to Wheel – LCA Phase of fuel used in vehicle
- GWP – Global Warming Potential
- PM – Particulate Matter
- TCO – Total Cost of Ownership
- PIEK noise standard- Piek-Keur Foundation currently certifies products and vehicle bodywork at 60 dB(A) noise levels and truck drivetrain noise (QuietTRUCK) at 72 dB(A).
- dB(A)- decibels, A weighted
- Development Fuel Obligation - To be recognised as a development fuel, the fuel must be either made from feedstock (but not used cooking oil or tallow), or renewable fuel of non-biological origin.
- GHG Obligation - amount of emissions (in $kgCO_2e$) which they need to offset to meet the GHG target level
- CO_2e - Carbon Dioxide equivalent which includes other GHGs.

For more details, contact:

Mike Sturgeon
Executive Director, ECG
Mike.Sturgeon@ecgassociation.eu

Christopher Ludwig
Editor-In-Chief, Ultima Media
Christopher.Ludwig@ultimamedia.com

Namrita Chow
Automotive Analyst, Ultima Media
Namrita.Chow@ultimamedia.com

Daniel Harrison
Automotive Analyst, Ultima Media
Daniel.Harrison@ultimamedia.com

More research can be found at: ecgassociation.eu/ecg-business-intelligence


ECG