yournrg FUELLING THE NATION

HVO FUEL

Renewable Fuels Assurance Scheme

CLEANER FUEL FOR A GREENER FUTURE:

UNLOCKING THE POTENTIAL OF HVO FUEL

Welcome

I'm thrilled to introduce you to Your NRG and share how we can support your business with our innovative and sustainable liquid fuel energy solutions. At Your NRG, we understand that fuel management is about far more than reducing costs - it's about driving operational excellence, advancing sustainability, and preparing your business for a greener future.

Our mission is to create a lasting positive impact on the environment and the communities we serve. By focusing on renewable energy solutions like our Hydrotreated Vegetable Oil (HVO) fuel, we're helping businesses transition to cleaner alternatives that reduce carbon emissions without compromising on performance. Our HVO Fuel, in particular, represents a significant step forward for industries looking to balance operational demands with environmental responsibilities.

We take pride in exceeding expectations through continuous improvement, providing more than just fuel - we deliver sustainable solutions that power industry, agriculture, and commerce, while also warming our communities. Whether it's reducing your business's carbon footprint, enhancing energy efficiency, or meeting your ESG targets, we're here to support you every step of the way.

As Managing Director, my goal is to ensure Your NRG becomes your trusted partner in navigating the greener energy market. Our team is dedicated to creating fuelling solutions tailored to your business needs, helping you achieve your goals while making meaningful progress toward a net-zero future.

Inside this HVO Fuel Welcome Pack, you'll find an overview of the benefits of making the switch with Your NRG; case studies that highlight our successes, and insights into how your business can achieve its sustainability and CSR objectives. With Your NRG, you'll have consistent access to HVO Fuel - designed to drive positive change, support growth, and align with your long-term vision.

Thank you for considering Your NRG as your partner in sustainable energy management. We're excited to work with you and help your business take those all important first and next steps in making the switch.

Warm regards,

Jeremy Royle
Managing Director, Your NRG

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HVO FUEL WHITEPAPER

1. Executive Summary

In the face of climate change and tightening emissions regulations, industries are seeking practical solutions to reduce their environmental impact without sacrificing performance. Hydrotreated Vegetable Oil (HVO) fuel offers a powerful alternative to traditional diesel, providing immediate reductions in carbon emissions, particulate matter, and other pollutants.

This whitepaper explores HVO Fuel's benefits, explains its production process, and outlines how industries in the United Kingdom can leverage HVO Fuel to meet sustainability goals and regulatory compliance. We will look at the operational, environmental, and financial advantages of switching to HVO Fuel, backed by regional case studies and industry-specific insights.

2. Introduction: The Urgency of Sustainable Fuel Alternatives

The Climate Challenge: Reducing carbon emissions and achieving net-zero targets is a global imperative driven by the urgent need to mitigate climate change and its devastating impacts on ecosystems, economies, and our societies. By prioritising carbon reduction and net-zero goals, we can ensure a sustainable future and protect biodiversity worldwide. These efforts require global collaboration, bold policies, and consistent public and private investment.

Fuel plays a pivotal role in global carbon emissions, particularly in industries such as logistics, manufacturing and construction. These sectors are heavily reliant on fossil fuels like diesel, gas oil and kerosene, for use in powering vehicles and equipment. These fuels are significant contributors to greenhouse gas (GHG) emissions and addressing the reliance on them is crucial for achieving net-zero targets.

Reducing carbon intensity of fuels is one of the fastest ways to decarbonise these industries. Transitioning to greener fuels is not just an environmental imperative, it is a strategic move to future-proof businesses against rising costs and regulatory pressures.

3. What is HVO Fuel?

Definition and Overview: HVO (Hydrotreated Vegetable Oil) is a renewable, low-emission fuel that serves as a cleaner alternative to conventional diesel. By choosing HVO Fuel, industries in logistics, manufacturing, and construction can significantly reduce their carbon footprint, contributing to a greener and more sustainable future while maintaining operational efficiency. Your NRG has been at the forefront of promoting HVO Fuel as a reliable and scalable solution for businesses seeking to enhance their sustainability efforts.

Production Process:

- HVO Fuel is produced through a process called hydrogenation, a sophisticated chemical reaction that transforms fats and oils into a high-quality, stable, and renewable diesel fuel. This involves subjecting feedstock (sustainable raw materials) to hydrogen gas under high pressure and temperatures, saturating the molecules to remove impurities.
- The hydrocarbons are then refined to improve stability and cold weather performance. (This includes isomerisation and hydrocracking.)
- The result is a paraffinic fuel that closely resembles traditional diesel but burns cleaner, delivering significant reductions in emissions while maintaining compatibility with existing diesel engines and infrastructure.

Environmental Credentials: Lifecycle analyses found that HVO Fuel can reduce GHG emissions by up to 90% compared to traditional diesel. Further, because HVO Fuel produces cleaner combustion, it results in lower tailpipe emissions of particulate matter, nitrogen oxides and carbon monoxide - leading to overall improved air quality in industrial areas.

HVO Fuel is biodegradable, posing less risk to soil and water systems in case of accidental spills. In contrast to fossil fuels, it breaks down much more readily in the environment.

4. The Advantages of HVO Fuel for Industry

4.1 Environmental Benefits

Carbon Reduction: HVO Fuel contributes to carbon reduction by significantly cutting CO_2 emissions, helping companies meet regulatory requirements and align with their net-zero goals. When burned in engines, HVO Fuel emits carbon that is part of the natural carbon cycle (unlike fossil fuels). Carbon neutrality is a key advantage in helping businesses fulfill regulatory emissions targets set by the UK government (including the Carbon Reduction Commitment) to combat climate change.

Reduced Particulate Matter: HVO Fuel produces fewer particulates, reducing air pollution and helping improve air quality for communities and work sites. Particulates such as black carbon and fine particulate matter are harmful pollutants that can contribute to respiratory diseases, cardiovascular problems and environmental damage. The use of HVO Fuel reduces the level of sulphur and aromatic hydrocarbons in exhaust gases, both of which contribute to particulate formation. (source: European Commission, Clean Fuels). This reduction not only helps meet stricter environmental regulations but also provides improved air quality for workers and communities.

Sustainable Sourcing: HVO Fuel is derived from renewable sources, such as waste fats and oils, which don't compete with food production. This makes it a more ethical and sustainable option than traditional biodiesel. HVO Fuel is produced using feedstocks – materials that would otherwise go to waste, helping reduce overall environmental impact. The use of recycled waste rather than food-grade crops makes HVO Fuel a circular economy model, according to the European Commission, meaning a more ethical approach to renewable fuel production. The sustainable sourcing of HVO Fuel also enhances its carbon neutrality, as the carbon dioxide emitted during its combustion is part of the natural carbon cycle and is offset by the carbon absorbed by the feedstock during its growth.

4.2 Operational and Performance Benefits

Engine Compatibility: HVO Fuel's compatibility with existing diesel engines and infrastructure means no costly modifications or new equipment are required. Since HVO Fuel is chemically similar to traditional diesel, it can be used as a direct drop-in replacement in most diesel engines, storage tanks, and refueling infrastructure. Additionally, according to the Low Carbon Vehicle Partnership (LowCVP), the energy output and performance of HVO Fuel are nearly identical to those of regular diesel, ensuring that the transition does not compromise engine reliability or efficiency. From a practical perspective, fuel tanks, fuel pumps, and pipelines that are already used for diesel are fully compatible with HVO Fuel, further minimising installation costs and disruptions.

Performance Benefits: One of its most significant advantages is its high cetane number, which is a measure of fuel's ability to ignite quickly and efficiently in an engine. The higher the cetane number, the better the ignition quality, leading to smoother and more reliable engine operation. In practice, this results in reduced engine knocking, quieter operation, and better overall performance, especially under cold-start conditions (source: European Commission, Clean Fuels). Benefit from smooth operations during and throughout the British winter. As a trusted fuel supplier, Your NRG ensures the availability of premium-grade HVO Fuel, helping industries transition seamlessly to a cleaner and more efficient fuel option.

HVO Fuel is known for its high stability, which means it is less prone to oxidation and degradation over time compared to conventional diesel. This chemical stability enhances the fuel's shelf life, making it a practical option for industries with intermittent fuel needs. Unlike traditional diesel, which can deteriorate if stored for extended periods, HVO Fuel maintains its quality over time, ensuring that businesses can store it for longer without worrying about contamination or performance issues (source: International Council on Clean Transportation, ICCT).

Reduced Maintenance: HVO Fuel's cleaner combustion process contributes to reduced wear and tear on engine components, potentially lowering maintenance costs and extending the life of machinery. This improved efficiency and engine health, combined with its environmental benefits (such as reduced emissions and particulates), make HVO Fuel a highly appealing choice for businesses looking to improve both performance and sustainability. HVO Fuel also produces minimal soot and deposits, which helps maintain cleaner engines, enhancing operational reliability and reducing downtime for maintenance.

4.3 Financial and Compliance Benefits

Cost Efficiency Over Time: While HVO Fuel can be more expensive than conventional diesel on a per-litre basis, its benefits in terms of reduced maintenance, enhanced engine longevity, and possible tax incentives make it cost-effective over the long term. Additionally, the lower frequency of breakdowns and reduced downtime contribute to operational savings that offset the initial cost difference.

Regulatory Compliance: With the UK's growing push for decarbonisation, companies adopting HVO Fuel are better positioned to meet current and future regulations. For example, HVO Fuel helps companies comply with the Clean Air Zones (CAZ) and supports the UK's commitment to achieving net-zero by 2050. Over time, these advantages make HVO Fuel a strategic investment for businesses seeking both economic and ecological benefits.

5. Industry Applications and Use Cases

5.1 Authorities - North East Procurement Organisation (NEPO)

Challenges and Emissions: Heavy-duty transport and logistics fleets are among the largest diesel consumers and emitters. As part of NEPO's commitment to building a sustainable future for the communities they serve, NEPO were looking for a way to reduce their carbon emissions without compromising the procurement solutions that NEPO provide to the public sector.

How HVO Fuel Helps: Immediate emissions reductions without operational disruption.

The Solution: To aid the government's Net Zero by 2025 goal, Your NRG is now supplying HVO Fuel to NEPO from its northern depots. HVO Fuel is a paraffinic diesel fuel made from 100% renewable raw materials, providing a greener alternative to conventional diesel. When used in NEPO's diesel gas engines and machinery, emissions are reduced by up to 90%, paving the way for a cleaner and greener future in the North East. NEPO, with the support of Your NRG, has decided to trial the use of HVO Fuel as part of its journey towards building a sustainable future. Analysis has shown that HVO Fuel emits 75 times less kg CO_2 equivalents per litre than conventional diesel, which was previously used to fuel street sweepers and refuse collection vehicles. Thanks to Your NRG and HVO Fuel, NEPO have successfully taken the step to reduce their environmental impact.

Comments: *As part of our commitment to building a sustainable future for our communities, we are continuously looking for ways to reduce our carbon emissions whilst providing procurement solutions for the public sector. The trial with Your NRG and HVO Fuel gives us the chance to explore fuels of the future, while lowering our environmental impact, without disrupting the operations of our members' fleet. So far, the partnership has been a great success and we are looking forward to continuing our journey to Net Zero with the help of Your NRG. -* ***Marie Foster****, Energy Lead at NEPO.*

5.2 Local Councils - Darlington Borough Council

Challenges and Emissions: In alignment with the UK government's 2050 Net Zero target, Darlington Borough Council sought to reduce the carbon emissions form their 26-tonne refuse vehicles as part of their commitment to a more sustainable future.

How HVO Fuel Helps: Reduces onsite emissions, aligning with government environmental standards.

The Solution: Partnering with Your NRG, Darlington Borough Council made a significant stride toward their sustainability goals by transitioning their 26-tonne refuse vehicles from traditional diesel to HVO (Hydrotreated Vegetable Oil) Fuel. Since adopting HVO Fuel, the council has achieved an immediate reduction in CO_2 emissions without sacrificing vehicle performance.

Comments: *At Darlington council, we recently switched to HVO Fuel to reduce carbon emissions from our 26-tonne refuse collection vehicles. Seeking a solution for lower emissions, HVO Fuel was the perfect choice. The transition was seamless, with HVO Fuel's drop-in capability, and we've seen an immediate reduction in emissions without affecting vehicle performance. Our vehicles run just as effectively as they did on conventional diesel, but without the harmful emissions. HVO Fuel delivers on its environmental benefits, and Your NRG has been a reliable partner, ensuring a smooth transition. -* ***Brian Graham****, Head of Environmental Services at Darlington Borough Council.*

5.3 Local Councils - Rushcliffe Borough Council

Challenges and Emissions: Rushcliffe Borough Council is a local authority serving approximately 50,000 households with a total population of 120,000. As part of their carbon reduction plan, Rushcliffe Borough Council aimed to reduce tailpipe carbon emissions by 90% across their HGV fleet. Given the fleet's wide range of vehicles, from 6 months to 14 years old, the council needed a solution that would be compatible with all their vehicles.

How HVO Fuel Helps: HVO Fuel offers immediate environmental benefits without costly vehicle replacement.

The Solution: In partnership with Nottingham Council and Your NRG, Rushcliffe Borough Council transitioned from conventional diesel to HVO Fuel to power their refuse collection vehicles, 7.5-tonne trucks and LCVs. Since making the switch, the council has observed a significant reduction in tailpipe emissions, without compromising vehicle performance, successfully achieving their carbon reduction goal.

Comments: *At Rushcliffe Borough Council, we switched to HVO Fuel as part of our carbon reduction plan to decrease tailpipe emissions by 90%, the main area of focus being our HGV fleet. Since the switch, we've seen a significant reduction in tailpipe emissions across our refuse collection vehicles, 7.5-tonne trucks and LCVs. We're highly satisfied with the performance of HVO Fuel and the reliable service from Your NRG. We look forward to continuing our journey toward a more sustainable future with their partnership. -* ***Rushcliffe Borough Council.***

6. The Future of HVO Fuel and Sustainable Fuel Adoption

Emerging Trends and Support: The UK is increasingly championing sustainable fuel initiatives as part of its commitment to reducing carbon emissions and achieving net-zero targets by 2050. This growing support manifests through government subsidies, tax incentives, and heightened regulatory standards aimed at accelerating the adoption of low-carbon solutions across industries.

Funding programs, such as those supported by Innovate UK and the Department for Transport, encourage the development and adoption of biofuels in sectors like logistics, aviation, and agriculture. Initiatives like the Renewable Transport Fuel Obligation (RTFO) incentivise suppliers by rewarding them for providing renewable fuels that meet greenhouse gas (GHG) reduction standards.

Regulatory pressure is especially strong in high-emission industries such as logistics, construction, and agriculture. For instance, Clean Air Zones (CAZs) in cities like Birmingham and London impose charges on vehicles using conventional fuels, further incentivising the shift to renewable options like HVO Fuel to avoid penalties and align with environmental standards.

HVO Fuel as a Transition Fuel: HVO (Hydrotreated Vegetable Oil) offers an immediate and practical solution for reducing carbon emissions while the development and adoption of long-term decarbonisation solutions, such as full electrification or hydrogen, continue to advance. Its compatibility with existing diesel engines and infrastructure means businesses can switch to a cleaner alternative without incurring the high costs of upgrading or replacing equipment. This makes HVO Fuel particularly valuable in carbon-intensive industries such as logistics, construction, and agriculture, where the transition to zero-emission technologies may take longer due to operational constraints or technological limitations.

HVO Fuel serves as a bridge fuel, supporting industries as they transition away from fossil fuels toward renewable energy systems. As technologies like electrification and hydrogen fuel cells become more viable, HVO Fuel provides an effective way to address current environmental challenges without delaying action. By integrating HVO Fuel into their operations today, businesses can reduce their carbon footprint immediately while positioning themselves for a smoother shift to the net-zero economy of the future.

7. Conclusion: The Case for HVO Fuel as a Key Driver of Regional Sustainability

Summary: In conclusion, Hydrotreated Vegetable Oil (HVO) delivers a comprehensive solution for businesses striving to reduce their carbon footprint while enhancing operational performance. Its ability to cut greenhouse gas emissions by up to 90% and improve air quality positions it as a leader in sustainable fuel alternatives. HVO Fuel's operational benefits, including superior engine performance, long shelf life, and cold-weather reliability, ensure seamless integration into existing operations. Furthermore, its role in aiding

regulatory compliance and unlocking potential tax benefits makes it an essential tool for companies aligning with net-zero targets. HVO Fuel is not just a fuel—it's a forward-thinking investment in sustainability, efficiency, and compliance.

Call to Action: UK companies have a unique opportunity to lead the way in sustainability by adopting HVO Fuel as a cleaner, renewable alternative to traditional diesel. With the focus on industrial decarbonisation and its alignment with the UK's net-zero targets, transitioning to HVO Fuel is a proactive step toward reducing carbon emissions, improving air quality, and enhancing environmental credentials. By integrating HVO Fuel into operations, businesses can meet evolving regulatory requirements, tap into potential incentives, and demonstrate a commitment to sustainable practices, helping to position the United Kingdom as a leader in low-carbon innovation. Now is the time to act, ensuring your company stays ahead in the journey toward a greener future.

Your NRG's Role: At Your NRG, we are proud to be a trusted provider of HVO Fuel, helping businesses take meaningful steps toward achieving their sustainability goals. With extensive expertise in renewable fuel solutions, we offer not only high-quality products but also dedicated customer support to ensure a seamless transition to cleaner energy. Our commitment to innovation and environmental responsibility means we're here to support your journey to a more sustainable future, delivering reliable, low-carbon fuel options tailored to your business needs. Partner with Your NRG today and join us in building a greener tomorrow.

8. Appendices

The EN 15940 Standard: This specifies the technical requirements and test methods for **paraffinic diesel fuels**, including HVO (Hydrotreated Vegetable Oil). These fuels are produced via synthesis or hydrotreatment and are designed for use in diesel engines, providing a cleaner alternative to traditional diesel.

Key Specifications:

1. **FAME-Free:** Paraffinic diesel under EN 15940 does not contain Fatty Acid Methyl Esters, ensuring superior stability.
2. **High Cetane Number:** Enhances ignition quality, improving performance in cold climates and across various applications.
3. **Low Sulphur and Aromatic Content:** Virtually free of sulphur and aromatics, reducing harmful emissions and air pollutants.
4. **Cold Weather Performance:** Excellent operational stability in sub-zero temperatures.
5. **GHG Reduction:** Capable of achieving up to **90% lower greenhouse gas emissions** compared to conventional diesel.
6. **Compatibility:** Suitable for existing diesel infrastructure, requiring no engine modifications.

The standard supports the use of paraffinic diesel fuels, including HVO Fuel, for a range of industrial applications and ensures that fuels meet consistent, high-quality benchmarks across Europe. More detailed specifications, including precise test methods and physical property limits, can be found in resources like **BS EN 15940:2023** and from government agencies or fuel suppliers adhering to the standard.

Further Reading and Resources: If you're looking for resources that discuss the benefits and performance of Hydrotreated Vegetable Oil (HVO), several reports and studies highlight its potential in reducing emissions and improving engine performance:

- **Green.org Report on HVO Fuel:** This article outlines HVO Fuel's environmental benefits, including a significant reduction in sulfur emissions and particulate matter. It emphasises the sustainability of HVO Fuel, particularly because it is derived from renewable sources like waste oils and fats. HVO Fuel offers a cleaner, more stable fuel compared to conventional diesel, and its adoption contributes to significant carbon footprint reductions.
- **Combustion and Emissions Study by Combustion Engines:** This study compares the combustion properties of HVO Fuel and other biofuels, confirming that HVO Fuel offers superior performance in diesel engines, especially in terms of lower emissions and particulate matter. It highlights the fuel's high cetane number, which improves combustion efficiency, and its advantages in cold-weather conditions, making it suitable for diverse industrial applications.

- **Sustainability and Market Potential:** The European Commission has pointed out the growing demand for HVO Fuel due to stricter emission regulations across various industries, including transport. As a low-carbon solution, HVO Fuel is positioned to play a key role in the transition towards a cleaner, more sustainable energy landscape.
- **Department for Transport – Low Carbon Transport:** This report discusses various low-carbon transport strategies and fuels, with a focus on HVO Fuel as a key player in the UK's efforts to decarbonise transport. It provides insights into how businesses can integrate HVO Fuel to reduce their carbon footprint and adhere to UK climate targets.
- **British Petroleum (BP) – HVO Fuel Case Studies and Reports:** BP provides insights into the growing role of HVO Fuel in reducing emissions from heavy-duty vehicles. Their reports focus on HVO Fuel's performance and how it aligns with broader sustainability efforts across industries.

9. Glossary

1. **Traditional Diesel** - a petroleum-based fuel derived from the fractional distillation of crude oil. It is specifically designed for use in diesel engines, which operate through compression ignition rather than spark ignition (used in gas engines). Traditional diesel remains a prevalent fuel, but its environmental drawbacks have spurred interest in alternatives such as biodiesel, hydrotreated vegetable oil (HVO), and other renewable diesel fuels.
2. **Carbon Emissions** - the release of carbon-based gases, primarily carbon dioxide (CO_2) and methane (CH_4), into the atmosphere as a result of human activities or natural processes. These emissions are significant contributors to the greenhouse effect, which traps heat in the Earth's atmosphere and drives global climate change.
3. **Particulate Matter** - a mixture of tiny solid particles and liquid droplets suspended in the air. These particles vary in size, composition, and origin, and they are categorized based on their diameter. Fine particles with a diameter of 2.5 micrometers or smaller are often a result of combustion processes, such as those from vehicle emissions, industrial activity, and wildfires.
4. **Net Zero** - the balance achieved between the amount of greenhouse gases (GHGs) emitted into the atmosphere and the amount removed or offset. It is a key goal in addressing climate change and involves both reducing emissions at their source and implementing solutions to absorb or offset remaining emissions, such as reforestation or carbon capture technologies.
5. **Biodiversity** -the variety of life forms found in a particular ecosystem, region, or across the entire planet. Biodiversity is crucial for maintaining the balance of ecosystems, providing ecosystem services such as clean air and water, pollination, soil fertility, and climate regulation. It also supports cultural, recreational, and economic activities. Conservation efforts focus on protecting biodiversity to sustain life and ensure ecological health for future generations.
6. **Fossil Fuels** - natural fuels formed from the decomposed remains of ancient plants, animals, and microorganisms that were buried and subjected to heat and pressure over millions of years. Fossil fuels are highly energy-dense and have powered industrialisation and modern life. However, their combustion releases carbon dioxide (CO_2) and other greenhouse gases, contributing significantly to climate change.
7. **Greenhouse Gas Emissions (GHG)** - the release of gases into the atmosphere that trap heat and contribute to the greenhouse effect, a process that warms the Earth's surface. These gases allow sunlight to enter the atmosphere freely but prevent some of the heat that the planet radiates from escaping into space. Greenhouse gases are the primary drivers of climate change, contributing to rising global temperatures, extreme weather events, and disruptions in ecosystems and biodiversity.
8. **Decarbonise** - reduce or eliminate carbon dioxide (CO_2) emissions from processes, activities, or industries. The term is primarily associated with efforts to combat climate change by transitioning away from fossil fuels (coal, oil, and natural gas) and implementing low-carbon or carbon-free technologies. Decarbonisation is a crucial element of achieving global climate goals, such as those outlined in the Paris Agreement, aiming to limit global warming to 1.5°C above pre-industrial levels.
9. **Hydrogenation** - a chemical process in which hydrogen molecules are added to an unsaturated compound, typically a liquid organic compound, in the presence of a catalyst. This process is commonly used to convert liquid unsaturated fats or oils (such as vegetable oils) into solid or semi-solid fats by adding hydrogen atoms to the carbon-carbon double bonds.

10. **Feedstock** - the raw material or primary substance used in an industrial process to produce a final product. It serves as the input for manufacturing, chemical processing, or energy production. Feedstocks can vary widely depending on the industry and application.
11. **Hydrocarbons** - organic compounds made up exclusively of hydrogen and carbon atoms. They are the primary constituents of fossil fuels such as coal, oil, and natural gas, and serve as a key source of energy and raw materials for various industries.
12. **Isomerisation** - a chemical process in which a compound is rearranged to form one or more isomers, which have the same molecular formula but different structural arrangements or spatial configurations. The process does not involve a change in the number of atoms but changes how those atoms are connected or arranged.
13. **Hydrocracking** - a chemical process used in petroleum refining to break down large, complex hydrocarbons in heavy oils or crude oil into smaller, more valuable products such as gasoline, diesel, and jet fuel. It involves the use of both hydrogen and a catalyst under high pressure and temperature.
14. **Paraffinic** - a type of fuel that is primarily composed of paraffinic hydrocarbons, which are saturated hydrocarbons made up of straight or branched carbon chains. These fuels are derived from sources like crude oil, natural gas, or synthetic processes, and they typically consist of long-chain alkanes (paraffins) that have been refined or processed for use in various applications.
15. **Biodegradable** - the ability of a substance or material to break down and decompose naturally through the action of microorganisms such as bacteria, fungi, or algae. This process occurs over time and results in the material being converted into natural elements like water, carbon dioxide, and organic matter, without leaving harmful residues in the environment.
16. **The Natural Carbon Cycle** - the process through which carbon is exchanged between various components of the Earth's system, including the atmosphere, oceans, soil, plants, and animals. It plays a crucial role in regulating the Earth's climate and maintaining a balance of carbon levels, which is vital for sustaining life. The natural carbon cycle maintains a balance of carbon between the atmosphere, land, and oceans, supporting life on Earth and influencing global climate patterns. However, human activities are rapidly altering this balance, leading to increased concentrations of CO_2 in the atmosphere and contributing to global warming.
17. **Carbon Neutrality** - achieving a balance between the amount of carbon dioxide (CO_2) emitted into the atmosphere and the amount removed from it. This means that an individual, organisation, product, or country offsets or reduces its carbon emissions to the point that its net emissions are zero. The goal is to prevent an increase in atmospheric CO_2, which contributes to climate change.
18. **Carbon Reduction Commitment** - was a UK government initiative introduced in 2010 to reduce greenhouse gas emissions from large organisations in the public and private sectors. The program required organisations to measure and report their carbon emissions and then purchase allowances to cover their emissions, encouraging them to take steps to reduce their carbon footprint. In 2019, the UK government decided to phase out the CRC and replace it with an expansion of the **Carbon Price Floor** and the **Climate Change Levy (CCL)**, both of which target carbon emissions from energy use in the business sector. The decision was part of a broader simplification of carbon pricing mechanisms, aiming to reduce the administrative burden and provide clearer incentives for businesses to reduce emissions.
19. **The Circular Economy Model** - an economic system aimed at minimising waste and making the most of available resources. Unlike the traditional **linear economy**, which follows a "take-make-dispose" pattern (where resources are extracted, used, and then discarded), the circular economy focuses on **reusing, repairing, refurbishing**, and **recycling** materials and products to extend their lifecycle. The goal is to create a closed-loop system where products and materials are kept in use for as long as possible, reducing environmental impact and promoting sustainability.
20. **Direct Drop-in Replacement** - a product or component that can be substituted for another with no modifications required to the system, device, or infrastructure it is being used in. It is designed to be fully compatible with the existing setup, so it fits and functions exactly as the original part or product without the need for changes in design, configuration, or installation.

21. **Low Carbon Vehicle Partnership (LowCVP)** - a UK-based organisation that works to accelerate the transition to a low-carbon road transport system. It brings together a wide range of stakeholders, including government bodies, industry groups, vehicle manufacturers, fuel providers, and environmental organisations, to promote the development and adoption of low-carbon vehicles and technologies.
22. **Cetane Number** - a measure of the ignition quality of diesel fuel. It indicates how easily the fuel ignites when injected into the combustion chamber of a diesel engine. Specifically, the cetane number is determined by comparing the fuel's combustion characteristics to those of a mixture of **cetane** (n-hexadecane) and **heptane**, two hydrocarbons that are used as reference standards.
23. **Oxidation** - Over time, fuels (like diesel or gasoline) can undergo oxidation even without combustion. This process is often referred to as **fuel degradation** and leads to the formation of acids, gums, and other compounds that can reduce fuel quality. This is why fuel stabilisers are sometimes used to extend the shelf life of stored fuels.
24. **Clean Air Zones (CAZ)** - designated areas within a city or region where access is restricted or regulated based on the emissions of vehicles entering the area. These zones aim to reduce air pollution and improve air quality by encouraging the use of lower-emission vehicles and discouraging the use of vehicles that produce higher levels of harmful pollutants such as nitrogen dioxide (NO_2) and particulate matter (PM).
25. **LCVs - Light Commercial Vehicles.** These are vehicles designed for the transport of goods, and they typically have a gross vehicle weight (GVW) of up to 3.5 tons. LCVs include a wide range of vehicles, such as small vans, pickup trucks, and other commercial vehicles used for business purposes. They are commonly used by businesses for deliveries, logistics, and other services that require the transport of goods but do not need the capacity of larger vehicles, like heavy goods vehicles (HGVs).
26. **Innovate UK** - the UK government's innovation agency, responsible for driving innovation and supporting the development and commercialisation of new technologies and ideas. It is part of **UK Research and Innovation (UKRI)**, which is an umbrella organisation that oversees various research and innovation funding bodies.
27. **Renewable Transport Fuel Obligation (RTFO)** - a UK government policy designed to promote the use of renewable fuels in the transport sector. It requires fuel suppliers to ensure that a certain percentage of the fuel they supply is derived from renewable sources. The aim of the RTFO is to reduce greenhouse gas (GHG) emissions from transport, improve energy security.

READY TO LEARN MORE?

- Call: **01642 686000**
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