Mission-critical power systems need to be reliable and resilient to support a range of vital infrastructures such as hospitals, smart grids and utility plants. But technologies such as diesel generators also need to be cleaner and more sustainable as part of the broader fight against climate change. Next-generation renewable fuels such as Hydrotreated Vegetable Oil (HVO), made from waste vegetable oils and other feedstocks, provide a high-quality slot-in alternative to conventional diesel that can reduce carbon emissions by up to 90%. Renewable fuels represent a flexible and dependable option for generator users looking to decarbonize their operations as they embark on a longer-term journey to zero emissions.

ENSURING A RESILIENT SUPPLY CHAIN

The technical and performance characteristics of HVO mean it is becoming increasingly popular as a renewable fuel solution across a broad base of industries. Consequently, multi-million-dollar investments are being made in the global supply chain, and HVO is becoming more readily available. New production facilities are regularly coming online, with the use of waste feedstocks encouraging shorter supply chains than first-generation biodiesels, which often rely on raw materials being shipped around the world. More local supply of HVO – closer to the end-user – means reductions in carbon emissions usually associated with transportation.

The growth in the HVO supply base is taking place in all key markets. In the US, for example, Chevron, Phillips 66, Diamond Green Diesel and Global Clean Energy have all made announcements to increase the capacity of HVO– with the US combined output expected to reach six billion gallons by 2024.

FLEXIBLE OPTIONS FOR REHLKO CUSTOMERS

Mission-critical power plays a significant role in our everyday lives. It underpins the resilient operation of many infrastructures such as data centers, smart grids, hospitals, utilities, and airports.

HVO holds significant potential as a next-generation renewable fuel, allowing this power to be supplied in a cleaner and more sustainable manner. Its compatibility with existing diesel engines for generators provides end-users with genuine operational flexibility without losing performance. It represents a simple
and efficient solution that is available right now.

Ultimately, Rehlko believes in supporting customers with

POWERSYSTEMS.REHLKO.COM/HVO

RENEWABLE FUELS – THE RELIABLE AND RISK-FREE SOURCE OF SUSTAINABLE MISSION-CRITICAL POWER

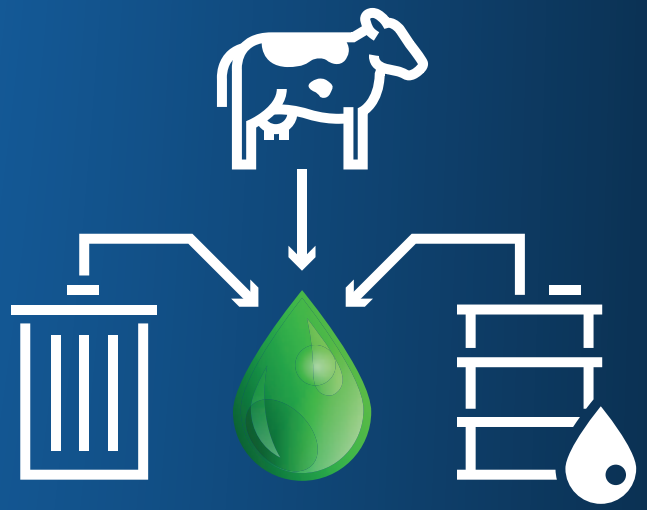
rehlko

INTRODUCING NEXT-GENERATION RENEWABLE FUELS

Imagine a fossil-free renewable energy source that reduces net carbon dioxide emissions by as much as 90%. It is a liquid fuel that can be used in existing infrastructure, such as mission-critical generators, without any modifications. And it has complete blending compatibility with standard diesel, providing end-users with total flexibility in their operations.

Such a compelling set of performance characteristics might seem too good to be true. But this renewable fuel is already available today – and its widespread adoption is set to accelerate the pace of decarbonization rapidly, supporting organizations embarking on a longer-term journey to zero emissions.

The fuel in question is hydrotreated vegetable oil (HVO), which is made from waste products and residues such as vegetable oils, animal fats and used cooking oils. The refining process means that HVO is a superior, cleaner-burning fuel than traditional first-generation biofuels, and that feeds through into fewer emissions across its lifecycle. These credentials make HVO a renewable alternative to conventional fossil diesel – providing new environmentally-friendly options for the users



PRODUCTION OF HYDROTREATED VEGETABLE OIL

So, where exactly does HVO come from, and how is it produced? The feedstocks are primarily waste products that don't impact agricultural land use. These include waste vegetable oil, used cooking oil, and animal fats, but also fish fat from processing waste and inedible technical corn oil generated in the production of ethanol from corn. HVO could also be made from photosynthetic organisms such as algae in the near-to-medium term.

In terms of the production process, impurities are firstly removed from the raw waste feedstocks. Then the HVO is produced by hydrogenation and hydrocracking of the raw materials using hydrogen at high temperature and pressure. The end-products are straight-chained hydrocarbons (paraffins) of consistent quality, which is very similar to the chemical properties of fossil-based diesel. According to the European Technology and Innovation Platform Bioenergy, the process is sufficiently flexible to convert a wide range of low-quality waste and residue materials to hydrocarbon-based drop-in fuels, making it a flexible diesel substitute for a broad range of diesel engine applications.

SIGNIFICANT ADVANCE ON EXISTING BIOFUELS

The HVO production process is different from that used to create first-generation biodiesels, which is based on feedstocks being reacted with short-chain alcohols such as methanol via a method of transesterification. Consequently, renewable HVO fuel has different properties to biodiesels that, in turn, deliver significant environmental and operational advantages.

Firstly, the production process of HVO is such that the final product
is similar in grade and quality to traditional diesel, so it can be used as a 'drop-in' for existing infrastructure, without modification. It is entirely compatible with the standard mix of petroleum-derived diesel fuels. Therefore, it can also be blended with traditional fossil diesel – boosting flexibility for the end-user.

Renewable diesel is a high cetane fuel, with a cetane number of 70- 90 compared to first generation biodiesel's 50-65 and fossil diesel's 40-55. High cetane has advantages such as better combustion, better cold start, and reduced emissions levels. Cetane number is often seen as a measure of the quality or performance of diesel fuel: the higher the number, the better the fuel burns within the engine of mission-critical equipment such as generators.

HVO is also very stable, with no bacterial growth, making it easier to handle and store than other fuels. It can be kept for up to ten years without any notable degradation. It is not prone to oxidation or water absorption, and it can perform in harsh conditions down to -32 degrees C. With a minimum flashpoint of 61 degrees C – it is safe to use in warmer climates.

The only performance downside to HVO is a slight reduction in power output due to lower volumetric mass. For mission-critical generator users, this does not result in less power electrical output, rather the fuel consumption will rise 3-5% to compensate for the difference in volumetric mass.
Generator transient response time with use of HVO is similar to performance with fossil diesel in operation.