



## DECARBONIZING MISSION CRITICAL POWER: HVO IS THE KEY

We need reliable **back-up power** for **mission-critical systems**, supporting our essential infrastructures such as **data centres, smart grids, hospitals, utilities, and airports**. But we also need to drastically reduce our **carbon dioxide emissions** and other **greenhouse gases**, to win the fight against **climate change**.

With **diesel generators** so important in **back-up power systems**, how do we balance these two requirements?

Reliable, **low emission back-up power** might seem like a long-term goal, but it is, in fact, a simple and affordable solution that is available right now. Even better, we can use existing **generators**, and adoption is likely to be rapid.

### New generation biofuel

A key tool to achieving this decarbonization is **Hydrotreated Vegetable Oil (HVO)**. Using **HVO** in existing **generators**, in place of **fossil fuel diesel**, can reduce **carbon emissions** by up to 90 percent.

**HVO** is produced from waste and residual fat from the food industry, as well as from non-food grade vegetable oils. After removing impurities, the raw materials undergo hydrogenation and hydrocracking using hydrogen at high temperatures and pressure. The end-product is straight-chained hydrocarbons (paraffin) of consistent quality, which have similar chemical properties to **fossil diesel**. In the near-to-medium term, **HVO** could also be made from photosynthetic organisms such as algae.

**HVO** overcomes many of the problems typically associated with first generation **biofuels**, such as instability and ageing when stored over long periods of time. While first-generation solutions had a limited storage life of just six months, **HVO** can be kept for up to ten years without notable degradation, and it is not susceptible to oxidation, water absorption or bacterial growth.

To further help reduce **emissions**, **HVO** is also a superior, cleaner-burning **fuel** than first-generation **biofuels**. Compared to both existing **biofuels** and to **fossil diesel**, **HVO** has a higher cetane number, falling in the range of 70-90. This means that it has advantages such, better cold start, **reduced emissions**, and better combustion. It can be used in low temperatures down to -32°C, and is safe to use in warmer climates.

As the benefits of **HVO** are becoming widely recognised, its supply base is growing quickly around the world. For example, the US is expected to reach an annual output capacity of six billion gallons of **HVO** by 2024, while big names such as Shell are investing heavily in Europe. China is also building multiple **HVO** plants, such as the biorefinery in Rizhao, which produces the **biofuel** from used cooking oil and palm oil mill effluent.

Overall, the use of waste feedstocks to make **HVO** reduces the need to ship raw materials around the world, so production can be closer to the end-user, which means **lower carbon emissions** from transportation.

### HVO-ready generators

Kohler has recently announced that its entire **mission-critical diesel generator** range is approved for **HVO**, including its **KD Series**. No adaptations to the installed **generators** will be required, allowing for the immediate rollout of **renewable fuel** to all Kohler customers who want to reduce their **carbon footprint**. There is no adverse impact on performance and no requirement for additional maintenance.

**HVO** is so similar to existing **fossil diesel** that it can be used as a direct, 'drop in' replacement without any **engine** modifications. It can also be mixed with **fossil diesel**, directly in the tank, in any proportion. This means that it can be used immediately as the sole fuel supply for all Kohler **generators**, whether they are new or already installed.

Kohler has already made its **generators** inherently more efficient, with optimized **engines** and after-treatment systems reducing **emissions** irrespective of which **fuel** is used. Now, adopting **HVO** has enabled us to take a huge step in our journey to **net zero greenhouse gas emissions**.

