

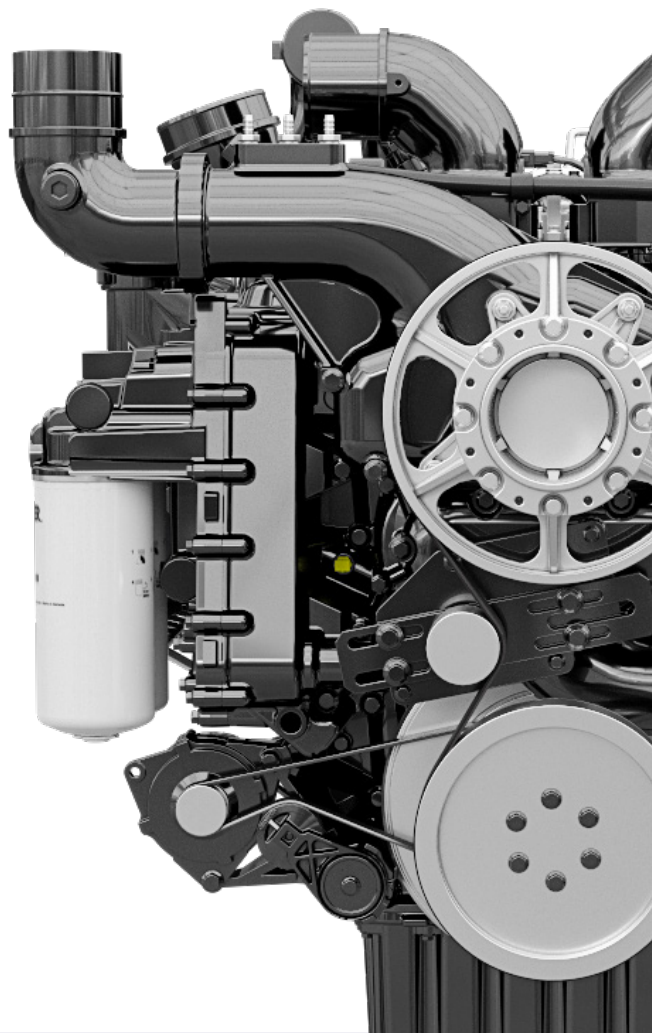
Decarbonizing mission critical power: HVO is the Key



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.

