



Use case I Netherlands HVO for colocation data center

HVO case specifications

Application



Colocation data center

Data center power demand



60 MW

Backup requirements



72 hours

Fuel type

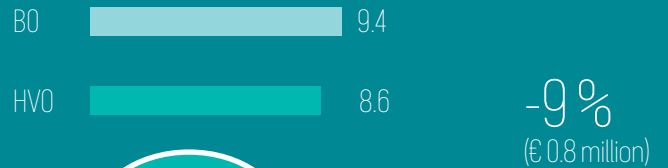


HVO

Emission savings



Costs (in million EUR over 10 years)



+



This equals the annual emission of 2.200 cars

BOOST YOUR GREEN IMAGE WITH A SUSTAINABLE BACKUP SYSTEM

HVO not only reduces emissions but improves your backup business case as well.

Executive summary

In this use case, you will learn how a data center can massively reduce CO₂, NOx and PM emissions while saving 14% in fuel costs over five years. Not only does this improve your ESG rating, but it also enhances your green image by transforming your diesel system, which is often perceived as a pollutant in the public eye, into a sustainable emergency power supply. Although hydro-treated vegetable oil (HVO) is currently more expensive than B0 fossil diesel (B0), our customer saves EUR 800,000 in operating costs in the first five years after the fuel switch.

What

The use case shows how switching from B0 to HVO creates significant opportunities and benefits for data centers with a power demand of 60 MW.

Where

Near Amsterdam, the Netherlands

Why

The transition to HVO enables reductions in emissions and costs thanks to its longer storage shelf life.

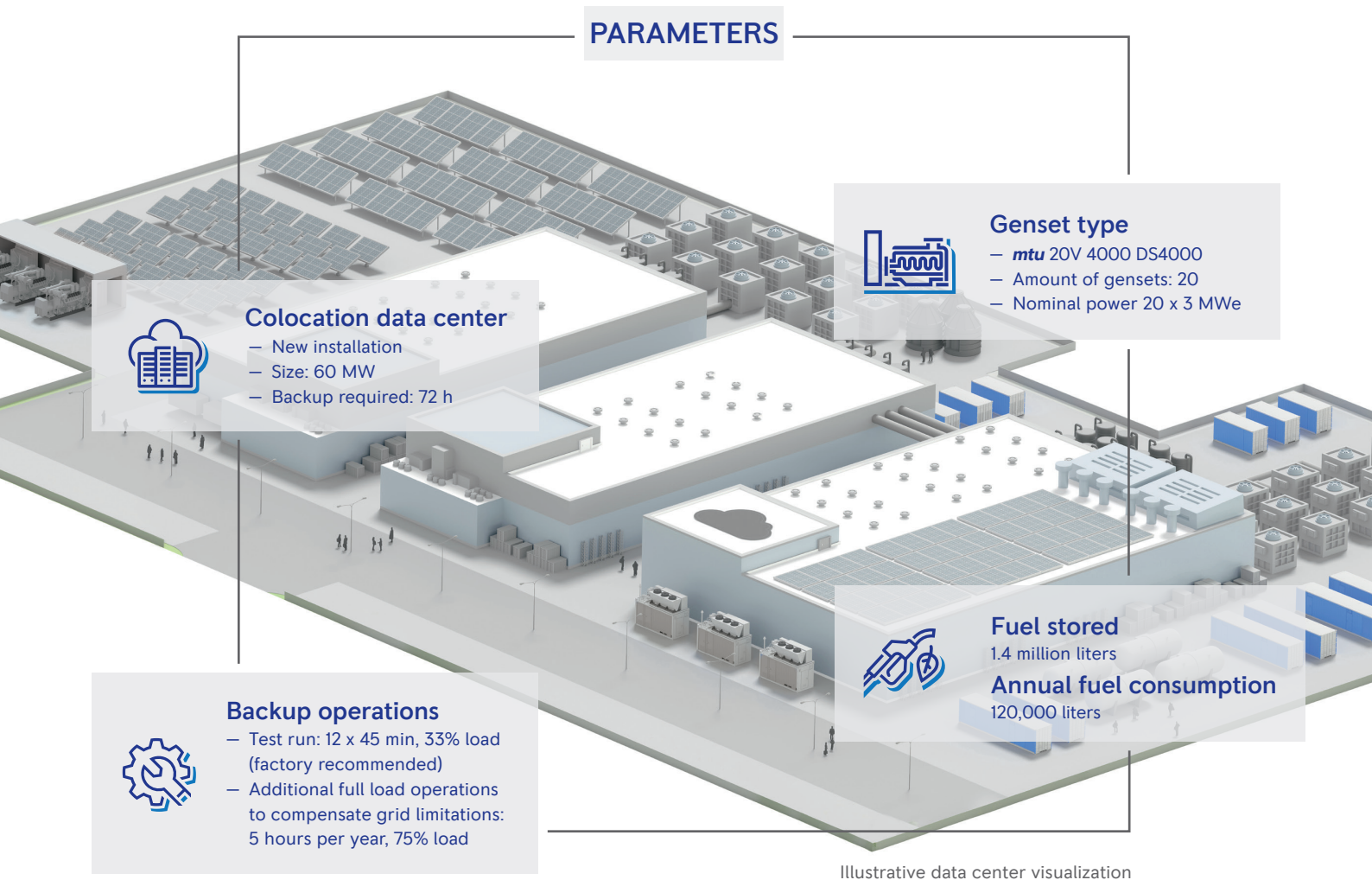

Main benefits

The benefits are not only in cost and emission reduction, using HVO also has a very positive impact on ESG reporting.




A Rolls-Royce solution

HOW THE SWITCH FROM DIESEL TO HVO OFFERS GREAT OPPORTUNITIES.

Fuel type 1: HVO fuel
(Neste MY Renewable Diesel)

HVO costs: 1.54 €/liter
Storage time: 8 years*



Fuel type 2: B0 Diesel fuel

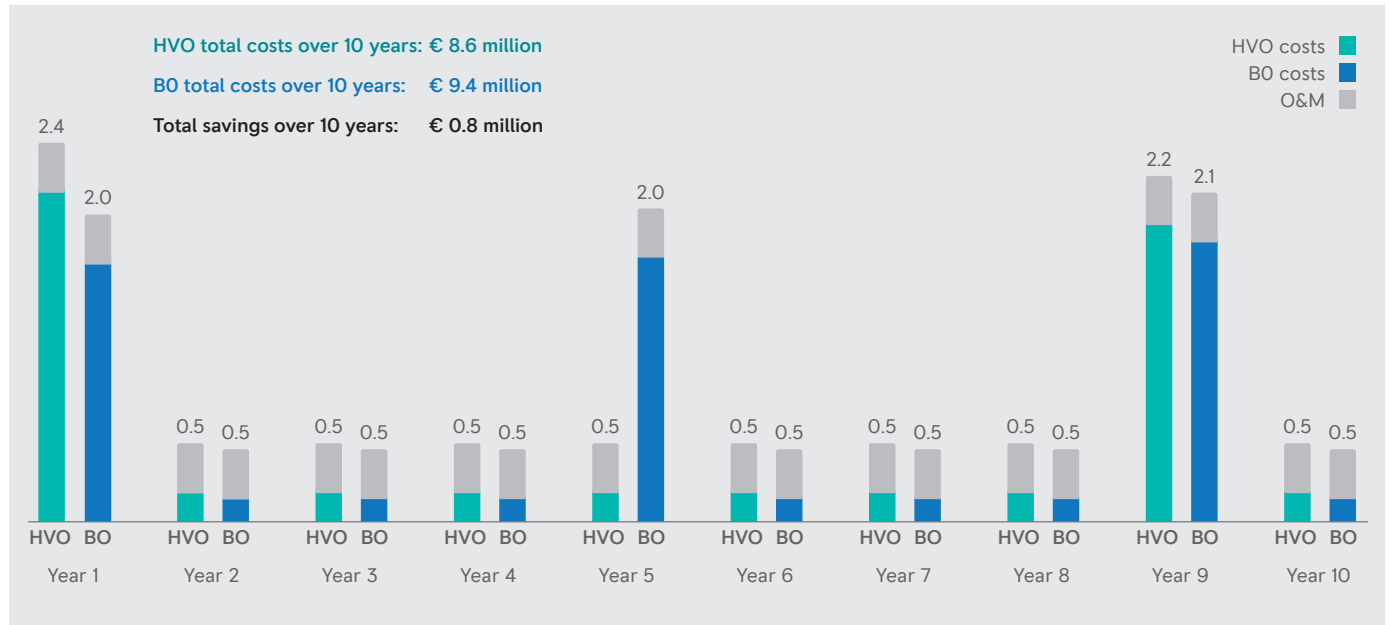
B0 diesel costs: 1.24 €/liter
Storage time: 4 years

Even though HVO is more expensive than diesel (based on 12-month average prices for B0 and HVO, including a discount for bulk deliveries), a positive business case can still be achieved due to the

superior quality and shelf life of HVO. On the following pages, you will learn how you can simultaneously reduce emissions and costs with your diesel back up systems.

* Based on use case examples in the market, HVO can be stored longer than B0, if the storage conditions are identical and the fuel quality is monitored regularly.

Operational expenditure (OpEx) over 10 years: BO vs. HVO



The longer shelf life of HVO compensates for higher price per liter: break-even after five years; savings of up to 0.8 million euros.

In the first year, we have a higher initial investment for HVO due to the 30 cent per liter surcharge. Operating costs are only slightly higher for HVO because only a small percentage of the fuel supply is used on site during test runs.

The BO/HVO price gap narrows over time: as global production increases and fossil fuel taxes rise, the price difference between HVO and BO steadily decreases, favoring the HVO business case.

Biggest impact: After four years, BO needs replacing due to expected degradation. This leads to a massive cost block. However, HVO does not need to be replaced until year 8 (in this use case). Therefore, the HVO offers a massive cost advantage in year 5.

Annual emission savings*

CO₂ emissions:

265 tonnes CO₂ savings each year contribute to sustainability targets and reputation to stay qualified for business relationships.

Annual CO₂ emissions (t)



NO_x emissions:

0.2 tonnes NO_x savings each year help meet stricter regulations while maintaining constant power output.

Annual NO_x emissions (t)



PM emissions:

47 kilos particular matter savings minimize black smoke and reduce danger to people's health and safety.

Annual PM emissions (kg)



* Exact emission values depend on the power generation process, the HVO feedstock as well as the engine series and type. Emission savings are based on "back-to-back" measurement on a mtu 20V4000 DS4000 diesel system with an 20V4000G94LF engine (NEA ORDE optimized) for the given load profile.

Vast HVO distribution network in the Netherlands

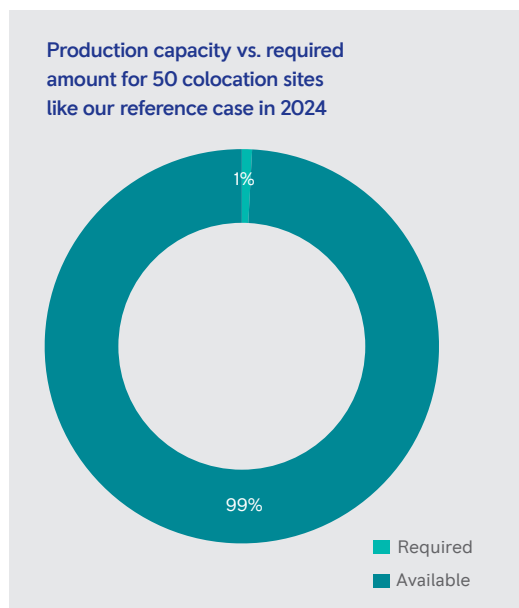
The excellent ISCC-certified HVO product of our fuel supply partners is already available in Finland, the Baltic countries, Sweden, Denmark, Belgium, the Netherlands, and the US.

In the Netherlands, the conditions for a fuel switch from fossil diesel to HVO are especially good for the following reasons (and we expect more to follow):

- The price spread between fossil diesel and HVO is relatively low, thanks to governmental incentive schemes.
- HVO has reached a high grade of maturity in the Netherlands, since it was introduced a couple of years ago.
- The HVO production site in Rotterdam can produce up to 1.4 Mt per year, which is more than enough for all data centers in and around the Netherlands. Furthermore, the production volume will more than double over the next couple of years.
- There are three well-established fuel suppliers available for bulk deliveries who have premium quality HVO in their portfolio and know how to supply a large scale data center.
- There are at least eight HVO terminals across the country.
- As our customer, you can count on our full support for the fuel switch process.

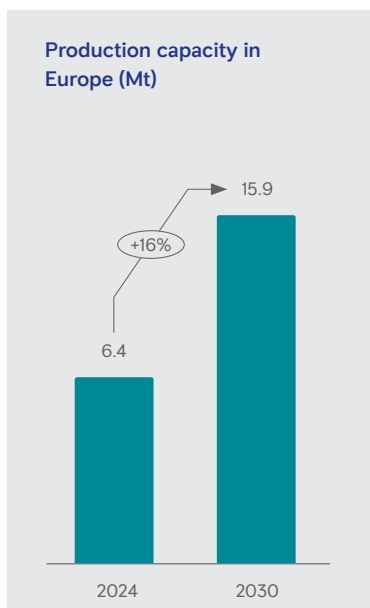


HVO availability in Europe and worldwide



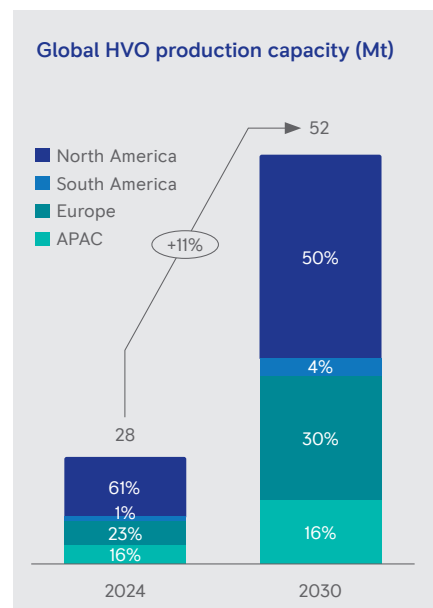
HVO availability secured

The 50 new colocation centers with a size of 60 MW consume only 0.9% of the HVO available in Europe.



Production to increase steadily in Europe

Production capacity in Europe is increasing from 6.4 Mt to 15.9 Mt between 2024 and 2030.



Global production capacity will reach 52 Mt in 2030

Global HVO production capacity will increase at a compound annual growth rate (CAGR) of 11% until 2030.

