

HVO: Scandinavia's form of renewable diesel

Sweden has thousands of cars running on renewable diesel sourced from the paper industry through hydrogenation while Finland's Neste is taking its own solution to the world.



Sweden plans to reduce the climate impact of the transport sector by 70% (excluding aviation) and to have a fossil-fuel-free vehicle fleet by 2030. Finland will go carbon neutral by 2035. While Norway has set similar targets the strategy for the transport sector is a full transition to electro mobility. In addition to electric cars, its neighbouring regions have invested heavily in the development of a renewable liquid fuels industry with private and public support. A new part of the fuel mix ecosystem is HVO.

HVO (Hydrogenated Vegetable Oil) is a renewable fuel component that can be blended in diesel or used instead of diesel in diesel engines. Hydrogenated vegetable oil consists of a vegetable oil or animal fats refined using hydrogen under the influence of a catalyzer in order to raise quality, turning it into a fuel for diesel engines. In 2017, renewable fuels accounted for 21.4% of the total

transportation fuel usage in Sweden.

The feedstock used in the process can be of the same or much lower quality than while producing the regular biodiesel but the final product is paramount or superior. The main strength points of the HVO diesel are: high cetane number, high energy density and lack of oxygen content. The key advantage of Green Diesel, however, is its CFPP level which can go down to -20°C or even -50°C irrespective of the feedstock used, according to GREENEA.

HVO can be blended into diesel or used in its pure form, commonly referred to as HVO100. Not many cars can currently run on HVO 100 but a number of heavy-duty vehicles are adapted to the fuel.

How and where is it produced

The EU Renewable Energy Directive (RED) establishes the type of feedstock that be used by refineries. Under the current administration, oils that can be used for food production or that can harm the environment such as palm oil are off limits. The use of residues from the production of palm oil or the meat industry can, however, be used.

Swedish oil company Preem sources most of its raw materials from Sweden, such as pyrolysis oils that can be made from sawdust, or lignin, a residual from paper mills. In 2016, Preem had a production capacity for renewable diesel of 140,000 tons per year. In 10 years' time their goal is to produce at least three million cubic meters of renewable fuel.

"The raw material we are using is residue out of the forest from the pulp industry. It allows to reduce greenhouse emissions by 90% compared to regular diesel. It is a very efficient way to tackle climate change," Sören Eriksson, Coordinator of Product Development at Preem, told PetrolPlaza.

Another major producer of biofuels in Scandinavia is Neste. By using wide range of waste fat and vegetable oil the Finnish refiner and retailer can produce a number of renewable products. Its most successful so far is Neste MY Renewable Diesel, which is now available in Finland, Sweden, the Baltics and California.

With 2.7 million tons, Neste is responsible for the majority of total renewable diesel production globally. Neste MY Renewable Diesel reduced climate emissions by 8.3 million tonnes of CO₂ in 2017. It sources its raw materials from different oils (palm, rapeseed, soybean, jatropha, camelina) and waste residues (animal fat, fish fat, used cooking oil).

Challenges facing HVO

According to Ebba Tamm, Swedish Petroleum & Biofuels Institute, there are a few challenges facing the expansion of HVO as a fuel. First, vehicle manufacturers need to provide cars that can run on HVO 100 if the fossil-free fuel is to become mainstream. Second, equipment at petrol stations and other facilities needs to be adapted as "biofuel products do not behave like traditional fuels." And finally, if Sweden is going to continue with ambitious targets for the production of HVO, they need to find the sources of feedstock.

With a higher percentage of HVO in Scandinavia's fuelling industry it will become a challenge to source enough raw materials. If other European countries decide to replicate that model, the challenge of sourcing raw materials will become even harder.