
Summary:

Renewable fuels – Renewable diesel: HVO

*TOI Report 1475/2016
Authors: Christian Weber, Astrid H. Amundsen
Oslo 2016, 14 pages Norwegian language*

HVO (Hydrotreated Vegetable Oil) burns cleaner than fossil diesel, and has several other advantages. The effects of any fuel on global climate depend on many factors in addition to the raw material itself. These include the origin of the fuel and its production, which has the potential to adversely affect climate, biodiversity and the local environment. Renewable diesel from waste products can result in large savings in CO₂-emissions, unless subsidies cause production to increase, in which case the raw materials can no longer be considered pure “waste”.

Renewable diesel fuel can be produced from renewable raw materials by adding hydrogen with the help of a catalytic converter (hydrogenation). An acronym for fuel produced from both plant and animal waste products is HEFA (Hydroprocessed Esters and Fatty Acids). When the oil is produced from plant material the acronym HVO is often used (Hydrotreated Vegetable Oil). The latter was adopted as name for these types of fuels, regardless of the type of oil used in the process.

The production of HVO is undertaken in conventional oil refineries. The product is a synthetic fuel comprising simple alkane molecules, without oxygen, nitrogen, sulphur or aromatics.

HVO is a high quality fuel that has several advantages over fossil diesel. The refining process allows one to adjust the properties of the fuel under cold conditions. It burns cleaner than traditional fossil diesel, resulting in lower emissions of particulate matter and nitrogen oxides when used to fuel older vehicles. For newer vehicles fulfilling the Euro 6/VI-specifications, it is the efficiency of the after-treatment systems that determines the emissions.

An estimation of the impact of biofuels on greenhouse gas emissions requires a detailed study of the production and origin of the raw material, and the refining process. Areas claimed for biofuel production can have secondary effects in that those areas cannot then be used for food production (Indirect Land Use Change, ILUC).

If one takes care when selecting raw materials and in locating its production, and if one pays close attention to the production process, HVO could be a fuel that not only burns cleaner, but also reduces the emission of greenhouse gases over the course of its lifecycle.

HEFA from slaughterhouse waste and used frying oil can lead to very low greenhouse gas emissions.