

Take the initiative to produce next-generation fuels that lead to decarbonisation; Partnership with Galp to start production of HVO/SAF



Hydro-treated Vegetable Oil (“HVO”, also known as Renewable Diesel) and Sustainable Aviation Fuel (“SAF”) have low GHG emissions and can be



INDEX

Key Features of Renewable Diesel (HVO)

GHG reductions of about 80-90% or more compared to conventional fuels

HVO/SAF production business with Galp in Portugal

Procurement of used cooking oil and vegetable oil residues as feedstocks in Asia

Both HVO and SAF can be produced in the same plant

HVO/SAF is a promising fuel, especially in Europe and US.

Plans to sell to European countries with supply-demand gaps

HVO and SAF, which contribute significantly to reducing GHG (greenhouse gas) emissions, have currently drawn an attention in the energy field. Mitsui

[Contact us](#)



Key Features of Renewable Diesel (HVO)

— First of all, please tell us what kind of fuel is called HVO.

Hitachi HVO is a liquid fuel, which is substitutable for diesel fuel, made from oil & fats, for instance, waste cooking oil, animal fats and vegetable oil residues. Since it is produced mainly from waste-derived raw materials, it is much more effective in reducing GHG emissions than conventional diesel fuel made from crude oil.



Yusuke Hitachi

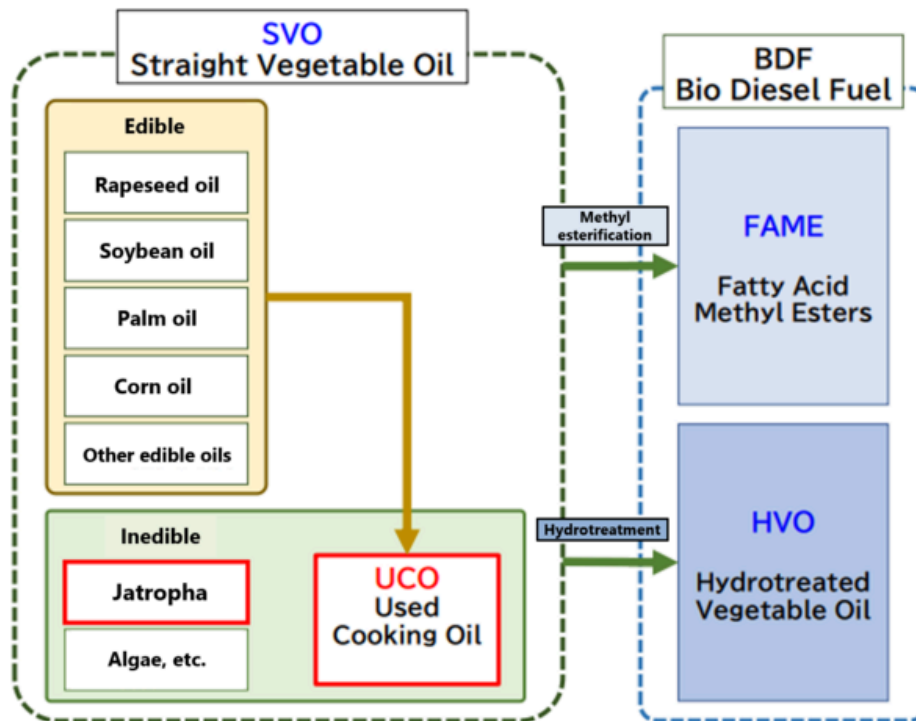
Deputy General Manager, SAF & Renewable Diesel Dept, Carbon Solutions Business Division, Energy Solutions Business Unit, Mitsui & Co., Ltd. Joined the company in 2005. He was engaged in marketing of industrial fuel oil and marine fuel oil in

[Contact us](#)



— what is the difference between HVO and biodiesel?

Hitachi In Europe and the United States, conventional biodiesel is called FAME (Fatty Acid Methyl Ester), and raw materials for HVO and FAME are almost identical. The difference is the production process. HVO can be completely replaced with conventional diesel fuel through a process called hydrogenation. FAME, on the other hand, can only be mixed with conventional diesel fuel at a maximum of 7% under current regulations because of quality reasons.



via www.mlit.go.jp

— If it is HVO, does that mean it can be used in diesel vehicles running today?

[Contact us](#)



that can be mixed without any special measures are called “drop-in” fuels.

GHG reductions of about 80-90% or more compared to conventional fuels

— I heard that ethanol-derived SAF, which you introduced previously, can reduce GHGs by 60-80% compared to conventional fuels, so what is the GHG reduction potential of HVO?

Hitachi It depends on the feedstock used, but if waste-based feedstocks are used, a reduction of 80-90% or so can be expected. This project at Galp's Sines refinery in Portugal is expected to produce approximately 250,000 tons per annum in the case of HVO production mode, and 200,000 tons per annum in the case of SAF production mode, resulting in an estimated GHG reduction of approximately 800,000 tons per annum through this project. This figure is a life-cycle figure that includes GHGs generated during the transportation of feedstocks.

HVO/SAF production business with Galp in Portugal

— I would like to ask you about Galp, the company with which you are collaborating. We understand that Galp is a global energy company headquartered in Lisbon, Portugal.





— What was the background of Mitsui's partnership with Galp?

Hitachi When we launched the Energy Solutions Business Unit in April 2020, we established several core business areas. One of them is the next-generation fuels business area, and we have decided to focus on mainly three products, HVO, SAF, and bioethanol, to develop business opportunities on a global basis.

Next, we discussed where the markets were, and since demand for the next-generation fuels is based on regulations, we have seen a big potential of the markets in Europe and US, which have strong regulations. We had been looking for business opportunities and partners in Europe and US, but in the end, we decided to focus on Europe, where there is demand for HVO and SAF based on the regulations, but there is a shortage of feedstock





Procurement of used cooking oil and vegetable oil residues as feedstocks in Asia

— I understand that the feedstocks for HVO and SAF are used cooking oil and residues of vegetable oil and others, but how is it possible for Mitsui to procure these feedstocks in Asia?

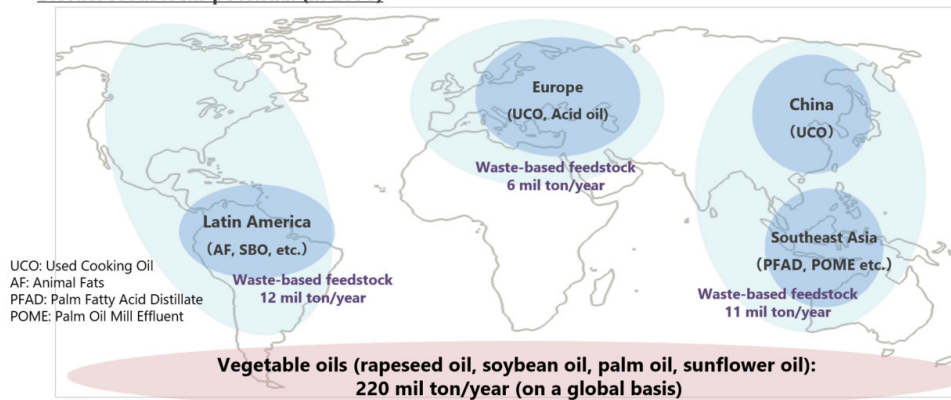
Hitachi One of the interesting and difficult aspects of this business is that while feedstocks mainly occur in the food sector supply chain, products produced from such projects are commodities in the energy sector. It is not so easy to connect the worlds of food and energy, but our Food Business Unit has been dealing with vegetable oil residues and used cooking oil for a long time since the past, and we believe we can take advantage of our integrated corporate strength as a Japanese sogo-shosha (general trading & investment company).

—Then, please tell us about the entire process from procurement of feedstocks to transportation and manufacturing.

[Contact us](#)

sources. Recently, vegetable oils that do not compete with food and are grown and pressed for fuel use, known as "energy crops," have been attracting an attention, and we are in the process of investigating their potential use in the future. Feedstocks recovered in this way will be transported to Europe, mainly on chemical tankers. These feedstocks may be used to produce HVO and SAF at Galp's Sines refinery.

Biofuel feedstocks potential (in 2030)



Created by Mitsui & Co. (December 2023)

Both HVO and SAF can be produced in the same plant

— Is the manufacturing process complex?

Hitachi Some feedstocks, for example used cooking oil, contain impurities such as water and garbage, so a pre-treatment facility is required. After such impurities are removed here, feedstocks are fed into a process plant called a hydrotreatment facility to produce HVO. Hydrotreating itself is a

[Contact us](#)

— Is the annual production of 250,000 tons of HVO large by global standards? Also, what is your evaluation of the facilities and technical capabilities of the Sines refinery?

Hitachi I think it is of a typical scale for an HVO/SAF plant. In Europe, where there are many aging refineries, the Sines refinery is relatively large and well-equipped with new equipment installed in recent years, and our technical adviser who visited the site was surprised and impressed by the clean and well-maintained plant.



Galp's Sinesh refinery

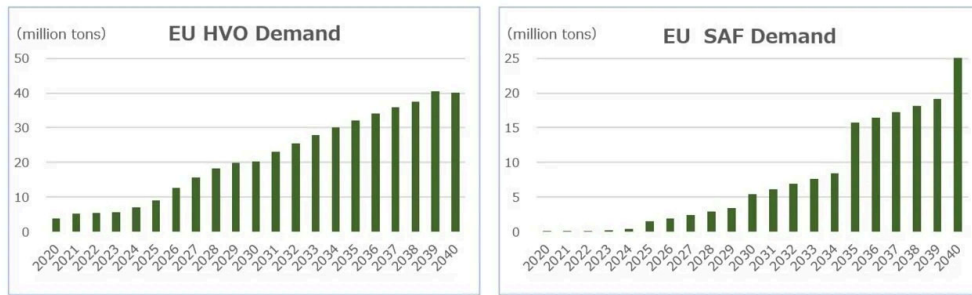
— I understand that the Sines refinery can switch between HVO and SAF production. Is this switchover something that can be done easily?

Hitachi Yes, there is basically no major difference in the feedstocks and

— **What are your thoughts on the expected demand for HVO and SAF?**

Hitachi We believe that both of these will undoubtedly increase in the future. This is because the EU27 countries are required to comply with the Renewable Energy Directive (“RED”), and based on this, the demand for HVO and SAF is expected to increase over the year.

Currently, the amount of SAF used worldwide is about 200,000 tons per annum, but demand is expected to grow at an accelerated pace as blending of SAF will become mandatory in Europe after 2025. Since aviation fuel is a difficult field to electrify and hydrogenate, SAF is considered the most promising means of GHG reduction at this time.



Created by Mitsui&Co. (December 2023)

— **What is the current price of HVO and what is your expectation for future price fluctuations?**

Hitachi The current price of HVO is two to three times of that of conventional diesel fuel. Although the price is expected to normalise to



regulations; therefore, further use of HVO in transportation sectors is anticipated in the near future.

— HVO is now being used for buses and other vehicles in Japan, although it is more like a demonstration experiment. Is there a possibility of developing a manufacturing business in Japan?

Hitachi Currently, Europe and US each use about 4 million tons of HVO per annum, and this is due to well-designed regulations to promote renewable energy. In the case of Japan, it is left to each company to set its own goals for the introduction of HVO, and at present, the use of HVO is still quite limited. If there is a change in the regulations in Japan, we would, of course, like to consider developing our business in Japan.



[Contact us](#)



— **Please tell us about Mitsui's role in this project, other than feedstock procurement.**

Hitachi Investment in HVO/SAF manufacturing business and product sales. HVO/SAF is still a relatively new business field, so there are naturally risks involved in developing the business, and risk sharing through alliances with reliable partners is important. In addition, the Renewable Energy Directive, which I mentioned earlier, is imposed on EU27 countries, and some of them may not have their own production or may lack it, so we aim to sell products to such countries, and contribute to the project, taking into consideration such a supply-demand gap.

— **I understand that this project is scheduled to begin commercial production in 2026. What is the current stage of the project?**

Hitachi Construction work began in December 2023, including site preparation work. Full-scale construction work, including ordering and assemble of large equipment, is scheduled to begin in the near future. We are also ready to manage the construction schedule as well as budget.

— **Finally, what dreams do you hope to achieve through this project to realise a decarbonised society?**

Hitachi We believe that HVO/SAF production business opportunity in Europe, where decarbonisation is progressing, is an important move for our



— Thank you very much for your time today.

[Click here to contact us](#)

Related Solutions



Fuel

**Hydrotreated-Vegetable Oil,
SAF production / Galp,...**



Fuel

**Production of Sustainable
Aviation Fuel (SAF) / LanzaJet**

[Contact us](#)



Australia
 • Mitsui's own gas and CO2 field
 • CS with JGSEIC and Westemans

business



MITSUI & CO.

Please feel free to contact us with any questions or concerns.

[Click here for inquiry form](#)

Visualize

- e-dash
- LCA Plus
- Earth hacks
- GEOTRA
- Aura-Shape

Optimize

- Air-as-a-Service
- GeM2 (MKI)
- Facility management
- The Mobility House
- Bearing
- Aura-Shape

Renewable energy

- Mainstream
- ReNew (India)
- RE/Japan
- RE/Thailand
- Wind O&M
- Biomass power

Hydro

- Caetano Bus
- Forsee Power
- Hexagon
- FirstElement Fuel
- Hiringa Refuelling
- Lhyfe
- Yuri Project

Fuel

Offset

Recycle

Info

[Contact us](#)



[Label Recycling](#)

[Paper Recycling](#)

**Search for solutions
by keywords you are interested in**

Enter keywords

[Terms of Use](#)

[Recommended Environment](#)

[Privacy Policy](#)

[Information Security Policy](#)

[Social Media Terms of Use](#)

[Contact Us](#)

COPYRIGHT © 1996-2022 MITSUI & CO., LTD. ALL RIGHTS RESERVED.

[Contact us](#)

