

Fact Sheet >>>

Background information on sustainable fuels

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Innovative agricultural concepts for biofuels generate multiple added value: energy + carbon sequestration + nutrition

The transport sector is responsible for just under 16% of global CO₂ emissions and, at 8.4 gigatonnes of CO₂ equivalent in 2024*, is the third largest source of emissions after power generation and manufacturing. The greatest potential lies in decarbonising energy-intensive aviation and maritime transport, which is highly dependent on heavy fuel oil.

Sustainable fuels are one of the most important drivers for significantly reducing CO₂ emissions in the sector and accelerating progress towards the ultimate goal of net-zero emissions. Innovative agricultural concepts with a holistic sustainability model for biofuels generate multiple added value in the areas of energy, carbon sequestration and nutrition.

*Source: GHG Emissions Report 2025



Biogenic fuels are an important element for significantly reducing CO₂ emissions in the transport sector (Photo: Smelty + Partners)

Key to innovation: biofuel

**Sustainable fuels are derived from
renewable and recycled raw materials
and have no negative impact on
the environment, climate or society.**

Maximising the innovation potential of sustainable biofuel cultivation

Biofuel from sustainable cultivation is the strategically sensible approach to climate protection. Prerequisite: It must not have any negative effects on the environment, climate or society. Without conversion, it can be used as a drop-in fuel in air, maritime and road traffic. Its advantages are manifold: It is biodegradable, far less toxic than fossil fuels and reduces both CO₂ emissions and local air pollutant emissions.

Fuels of the future

 SAF	 SMF	 HVO
Aviation	Maritime	Land
Sustainable aviation fuels can be mixed with fossil fuels without requiring aircraft to be retrofitted, reducing CO ₂ emissions by 80%.	Sustainable marine fuels can be mixed with fossil fuels without the need to retrofit ships and can reduce CO ₂ emissions by 80%.	Sustainable vehicle fuels can be used without converting vehicles and can reduce new CO ₂ emissions by 80%.

SAF = Sustainable Aviation Fuels SMF = Sustainable Marine Fuels HVO = Hydrotreated Vegetable Oil

Source: Innofuels.de

Innovative approach to biofuel cultivation – holistic, scalable + efficient

Innovative, digitally supported agricultural solutions are essential for the cultivation of biofuels. The aim is to use a holistic, scalable and efficient approach to manage agricultural areas in a way that meets needs, conserve resources and protect the environment, thereby continuously increasing yields, diversification and added value.

Optimal agricultural solution – combining tradition and innovation

The optimal agricultural solution in the age of climate change often combines forgotten traditional farming methods with innovative agricultural technologies to achieve maximum added value along the value chain.

TRADITION

Back to the roots

- ⊕ Continuously increase yields and diversification with a nature-based approach using traditional farming methods.
- ⊕ Boosting biodiversity and carbon sequestration at the same time.
- ⊕ Human-made ecosystems protect fields from wind and weather, lower temperatures, reduce soil erosion and improve water balance and soil fertility.

INNOVATION

Data instead of instincts

- ⊕ Increase efficiency and yields with smart agricultural technologies.
- ⊕ Sensors directly in the field identifying which areas need water, fertiliser or plant protection products.
- ⊕ The perfect human-machine symbiosis, combining human skills and knowledge with machine efficiency and precision.

Multiple value creation for the cultivation of biofuels:

Energy + carbon sequestration + nutrition

The holistic sustainability model of regenerative agriculture provides both raw materials for biofuel production and dietary supplements from by-products. It also supports natural carbon sequestration and carbon capture from soils, fast-growing plants, and trees.

Optimal carbon storage

BIOFUEL STORAGE

Valuable Asset for Monetising Emission Certificates

⊕ Climate-positive Crops

With their exceptionally fast growth rate and deep root system, energy crops are also highly effective carbon storage plants that can bind significant amounts of CO₂ even in dry or arid soils.

⊕ Potential for Carbon Sequestration

Energy crops can store around 132.8 tonnes of carbon per hectare yearly. This makes them a valuable asset for the monetisation of emission certificates.

⊕ Food Supplements

The leaves can be used to produce food supplements. They are rich in protein, vitamins and micronutrients and can be used in nutrition programmes in many regions to support disadvantaged population groups, counteracting both malnutrition and the energy transition.

⊕ Desert Greening

Mixed cropping optimises soil use, produces edible products and stabilises the soil, improving moisture retention and accelerating desert greening, while increasing long-term carbon storage capacity.

Optimal ESG potential

ESG-POTENTIAL

SUPPORTING ACHIEVEMENT OF ESG GOALS

+ Food Safety

As non-edible plants, some energy crops avoid the debate around food versus fuel.

+ Carbon Sequestration

The CO₂ absorption of trees is supplemented by improving the carbon content in the soil using biochar.

+ Water Efficiency

The reuse of treated wastewater reduces the demand for fresh water and supports circular irrigation models.

+ Waste Reduction

The utilisation of the entire biomass minimises waste and boosts energy recovery.

ESG = Environmental, Social + Governance

Current project

Aviation and agriculture experts from Smelty + Partners in Germany and the United Arab Emirates (UAE) have developed a scalable, efficient and sustainable agricultural solution for the corridor model that will enable the UAE to achieve its SAF target of sourcing at least 1% of its fuel from domestically produced SAF by 2030. This corresponds to a production volume of around 700 million litres of SAF.

Benefits

It enables the country to position itself as a global pioneer in sustainable aviation with a flagship project and to promote the UN Sustainable Development Goals in the areas of climate, hunger, land restoration and sustainable agriculture.

- + Ecological:** Improving climate, soil and air quality as well as continuously reducing CO₂ emissions.
- + Social:** Creating further education programmes and jobs in new professions of the future.
- + Economical:** Continuously open up and increase economic efficiency with new segments.

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