UNION ZUR FÖRDERUNG VON OEL- UND PROTEINPFLANZEN E.V.

Germany's most beautiful oil fields

Resource and climate protection in transport

First there is rapeseed

When rapeseed blossoms in springtime, millions of bees and the wind together provide the foundation for rapeseed oil production, with the rapeseed grains from the pods being pressed in oil mills. This is how rapeseed oil and rapeseed meal is produced.

Rapeseed oil has an energy density that corresponds approximately to that of diesel fuel. The liquid raw material is processed into rapeseed oil methyl ester (RME), i.e. biodiesel, in just one process step called transesterification. According to the diesel fuel standard, diesel can include up to 7 % by volume biodiesel. Where this is the case, it is indicated with a sticker on the fuel pump or pump nozzle.

The rapeseed meal used as a protein can largely replace soya.

For resource protection

The flowering rapeseed fields give the impression that a lot of rapeseed is being cultivated. This is not the case, however. It accounts for around 11 % of arable land in Germany and only 3.7 of Germany's entire land mass. This rapeseed crop volume is more than sufficient for producing the biodiesel/rapeseed fuel needed to meet the German agricultural and forestry sector's total diesel fuel requirement of around 1.6 million tonnes.

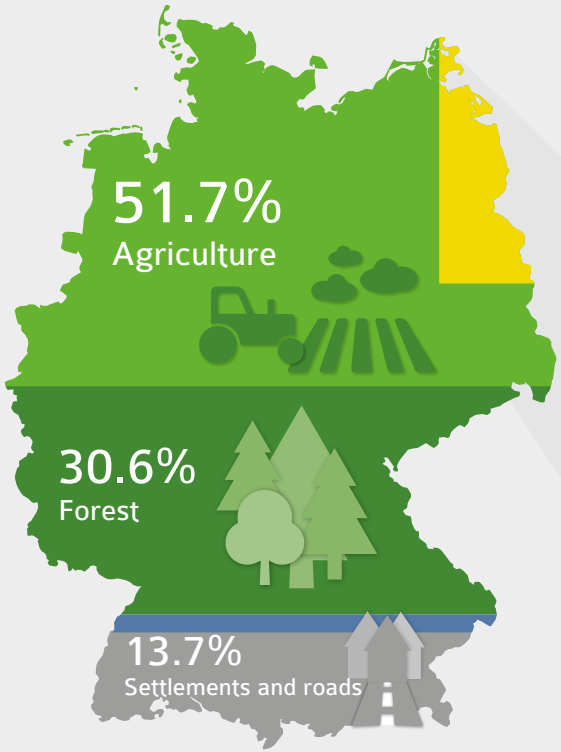
The use of rapeseed oil as biodiesel and its admixture with conventional diesel has a number of positive effects and advantages, for example:

- ✓ Reducing the amount of imported oil and foreign currency payments
- ✓ No need for additional fuel pumps and thus investment in new infrastructure

General positive effects from the cultivation of rape:

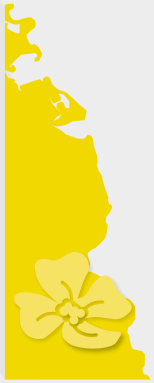
- ✓ More flexible crop rotations: Rapeseed makes cereal-rich crop rotations more flexible and is not compatible with itself, therefore monocultures, i.e. repeated cultivation on the same farmland, is not possible.
- ✓ Development of new sales markets and added value for agriculture. Producing even more grain makes little sense in view of the very good supply situation not only in the European Union but also worldwide, resulting in low prices for farmers.

The oat principle today



Germany: 35.7 million ha.

Land use in Germany and the area under rapeseed necessary for agriculture and forestry sector self-sufficiency



Rapeseed cultivation (1.3 million ha.)

Area requirement for self-sufficiency:

75% of the domestic rapeseed harvest (1.6 million t of rapeseed oil from 1 million ha. of rapeseed cultivation) is enough to fully supply the German agricultural and forestry sector with fuel.

Source: TFZ-Kompakt 13, 'Klimaschutz durch Rapsölkraftstoff', amended and rounded; figures based on 2013–2015

For climate protection

Climate protection is one of mankind's most important current and future tasks. With this in mind, at the end of 2015 the legally binding Climate Protection Agreement was signed in Paris, thereby committing the international community to the so-called two-degree target. This means that from now on the maximum amount of greenhouse gas permitted to enter the atmosphere must be limited, so that it warms up by no more than 2 degrees Celcius by 2050. The target should even be 1.5 degrees.

Today, 2017, the deadline is only 33 years away. This climate protection target is therefore to be achieved globally in just one generation. This means the younger generation in particular will not only experience it but also have to contribute to it personally.

Germany leads the way ...

with the Climate Action Programme 2020 and the Climate Action Plan 2050. These national action plans encompass a package of measures for reducing greenhouse gas emissions by 40 % by 2020 and 55 % by 2030 compared to the base year of 1990. Biodiesel will play a decisive role in this.

The Climate Action Plan 2050 ...

Experts point out that the 2020 national climate protection target is already likely to be missed unless more efforts are made.

aims to reduce greenhouse gas emissions by around 90 %. This means that in 2050 transport will be virtually 'fossil-free'. Many alternatives, such as e-mobility, are only now being developed. The infrastructures for these and other alternatives are either not available or are only currently being built. Switching existing diesel vehicle fleets to biodiesel represents a comprehensive contribution to greenhouse gas reduction.

A belief in technology and hope are unlikely to prove sufficient when it comes to reaching climate protection targets.

The climate protection targets and the ambitious deadlines set for them mean that the alternative biodiesel is a must. It should form the basis for tapping into other sustainably produced raw-material sources in agriculture on the basis of technological progress. It is the sum of these and other alternatives, including the all-electric drive and the production of fuels from renewable energy (power-to-gas, power-to-liquid), which makes a noticeable contribution to greenhouse gas reduction in transport in the short and long term. This is because the greenhouse gas savings that can be made today will reduce the pressure to act in years to come.

The challenge of global warming

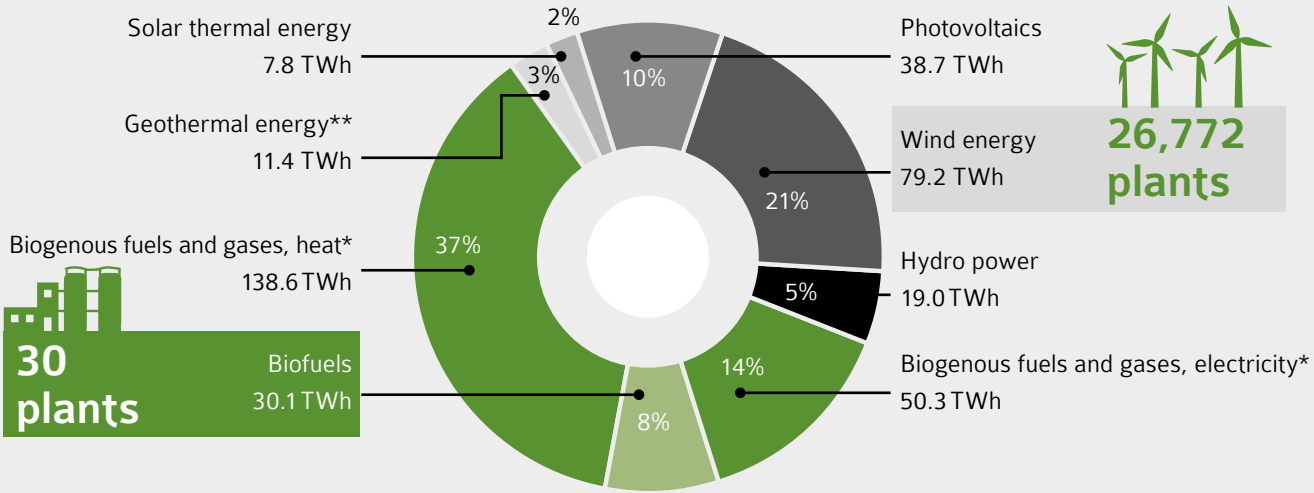
Battery operation based on sustainable renewable energies will play a major role in the future. However, market penetration will be evolutionary and not revolutionary. The task is immense, as in Germany it means replacing around 18 million tonnes of gasoline and around 37 million tonnes of diesel fuel (as of 2016).

Biofuels (biodiesel and bioethanol) currently cover around 5 % of the fuel requirement in Germany.

At first glance this seems relatively little, but to replace this quantity with renewable electricity from the approx. 26,800 wind power plants, 9,500 of them would have to be 'reserved' for battery supply alone.

Energy supply from renewable energy sources (2015)

Total energy supply: 375.3 terawatt hours (TWh)



© BMWi on the basis of AGEE statistics, time series of the development of renewable energy in Germany, information current as of August 2016 | * with biogenic fraction of waste | ** Electricity production from geothermal power approx. 0.1 TWh (not separately shown)

GHG reduction targets by sector up to 2030

Field of action	1990	2014	2030	2030*
Energy industry	466	358	175–183	62–61%
Buildings	209	119	70–72	67–66%
Transport	163	160	95–98	42–40%
Industry	283	181	140–143	51–49%
Agriculture	88	72	58–61	34–31%
Subtotal	1,209	890	538–557	56–54%
Other	39	12	5	87%
Total	1,248	902	543–562	56–55%

For the national climate protection target of a 55 % reduction in greenhouse gases, the Federal Government has divided the economy up into different sectors and set specific targets. These must be met by 2030. As the table shows, since 1990 there has been virtually no contribution to greenhouse gas reduction. Although engines have become increasingly efficient in terms of fuel consumption, vehicles are simultaneously becoming increasingly heavy and increasingly fitted with electrical systems.

in millions of tonnes CO_2 equivalent | * % reduction compared to 1990 | Source: Climate Action Plan 2050 (14.11.2016)

In addition, there is growing criticism that not only the nitrogen oxide measurements but also the CO_2 values per km for cars have not been measured correctly. Passenger cars emit more CO_2 than indicated, although the final actual value naturally depends on the respective driving behaviour.

To summarize,

reducing the amount of greenhouse gases produced by road and especially air traffic is a complex task, which naturally requires improvements in the availability of public transport, the introduction of car-sharing concepts, a higher personal willingness to use buses and trains, as well as other options besides switching to regenerative fuels and drives. However, sustainable biofuels such as biodiesel and bioethanol can make an 'advance contribution' to climate protection.

The minimisation of greenhouse gas pollution by road users also depends on environmental awareness and consequently on the acquired vehicle type and driving behaviour.

Sustainability

Biofuels such as biodiesel cannot simply be added to diesel in Germany or the European Union. The Directive on the Promotion of the Use of Renewable Energies (2009/28/EC) sets certain sustainability requirements for the origin of the biomass, social standards and greenhouse gas reduction in growing and production.

FROM 2018, THE PROVEN GREENHOUSE GAS REDUCTION COMPARED TO DIESEL MUST BE AT LEAST 50 %.

With regard to sustainability certification, the EU Commission has approved certification systems that must be accepted and/or introduced not only in Germany but in all countries that export biodiesel or biofuels to Germany or the EU.

Germany goes one step further …

by requiring companies in the oil industry to prove a certain greenhouse gas reduction. For 2017 to 2019, this amount is at least 4 %, and from 2020 at least 6 %. The calculation is actually quite simple: a company sells diesel and petrol. The volume it sells is multiplied by the emission value of 94.1 g CO_2 per megajoule (relative to the energy content). This amount of CO_2 must then be reduced by 4 % in the current calendar year. This is a commitment that can be easily met with biofuels. But companies are, of course, keen to meet this obligation cost-effectively and using as little biofuel as possible. Accordingly, a technology- and raw-material competition has started in Germany for the highest greenhouse gas efficiency.

According to the calculations of the Federal Office of Agriculture and Food (BLE), in 2015 6.5 million tonnes of CO_2 were saved with biofuels. This form of competition is internationally unique and should therefore be introduced not only in the EU, but also for other sectors currently using biomass as a raw material source for energy or material use.

The evaluation of the responsible agency in Germany, the Federal Office of Agriculture and Food (BLE), confirms that on average biofuels reduce greenhouse gases by 70 %.

Oil and protein (in)seperable linked

Germany and the European Union are among the regions in the world with the highest cereal yields. Despite the demand from the food industry and the feed industry, the EU needs to export grain. On the other hand, it has to import fodder protein. Rapeseed cultivation helps reduce this deficit, balance the market and stabilize prices, as the share of rapeseed meal (average 5.5 million tonnes) is around 60 %.

Increasingly more milk products, eggs and also beef products are being labelled 'non-GMO'. Moreover, research projects are being promoted to develop rapeseed protein directly as a protein source for human consumption.

Conclusion:

Without the sale of rapeseed oil for biodiesel production, the current volume of rapeseed cultivation would not be economically viable in the future. The joint production and use of rapeseed oil and protein represents the economic foundation that will allow blooming rapeseed fields to continue to be a feature of the landscape.

In Germany and the EU, rapeseed is by far the most important GMO-free protein source (harvesting volume approx. 21 million tonnes).

Further Information

The Climate Action Programme 2020 (PDF, BMUB)

Further information from the UFOP can be found here

The Climate Action Plan 2050 (PDF, BMUB)

Photo credits
Title © Fotokostic/shutterstock.com; P. 2 © UFOP e. V./Karla Holländer; P. 3 © UFOP e. V.; P. 6,7 © UFOP e. V./Johannes Haas; P. 9 © Mariusz Szczygiel/shutterstock.com; P. 10 © Mara Zemgaliete/Fotolia; P. 14 © Eskymaks/Fotolia; P. 15 © UFOP e. V./Dietrich Habbe; P. 16 © Milos Muller/shutterstock.com

Union zur Förderung von Oel- und Proteinpflanzen e. V.
Claire-Waldoff-Straße 7 · 10117 Berlin, Germany

info@ufop.de
www.ufop.de
twitter.com/ufop_de