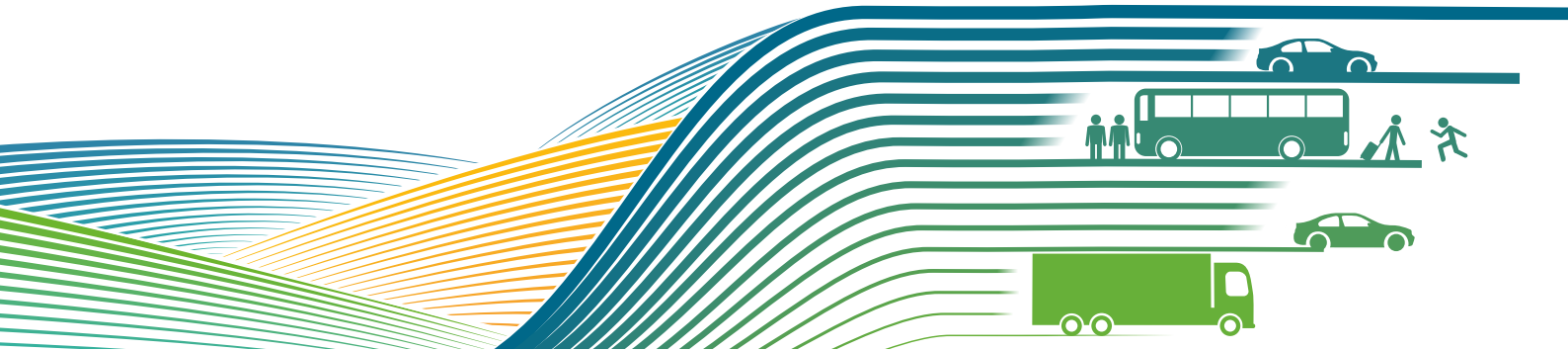
# POLICY INFORMATION
# BIOFUELS

## Current Consumer Survey
## Facts and Background



BDBe Bundesverband der deutschen Bioethanolwirtschaft e.V.

OVID Verband der Ölsaaten-verarbeitenden Industrie in Deutschland

ufop

VDB Zukunft tanken.

**What does the German public think about biofuels?** With a view to answering that question, we commissioned the market research institute KANTAR to collect and evaluate opinions on biodiesel, bioethanol and biomethane. The results are clear: the vast majority not only likes biofuels, but would even favour incorporating higher levels into blends than is currently the case. At the same time, the respondents found it important that these biofuels are sustainable.

The transport sector must make a larger and more rapid contribution to climate protection in the future. As a consequence of the ruling from the Federal Constitutional Court in late April 2021, post-2030 climate change mitigation targets had to specified and in addition the the Federal Government adopted more stringent objectives in this respect for the period up to 2030. This particularly affects the transport sector. There is a heightened awareness of this challenge. Biofuels are already doing their bit, securing a reduction in greenhouse gas emissions of 9.7 million tonnes of $CO_2$ in 2019 and approx. 13 million tonnes of $CO_2$ in 2020.

However, biofuels can do even more, for they are a link in a diverse commodity chain: the raw materials grown in our fields are used not only for biofuels but for a wide range of products, ranging from animal feed to household products such as toothpaste or hand disinfectant.

Information on this and a host of other relevant issues related to biofuels is presented in this brochure.

Norbert Schindler,
BDBe Chairman

Jaana Kleinschmit von Lengefeld,
OVID President

Detlef Kurreck,
UFOP Chairman

Stefan Schreiber,
VDB President

*"Sustainably produced biofuels can make a significant contribution to reducing the burden on the national budget over the next ten years by significantly cutting greenhouse gas emissions in the transport sector."*

***Prof. Dr. Claudia Kemfert,*** *Head of Energy, Transport, Environment Department, German Institute for Economic Research (DIW Berlin) and Professor of Energy Economics and Energy Policy at Leuphana University.*

*"In the transport sector, supporting policies should be adopted to scale up sustainable production of first- and second-generation biofuels ."*

***Global energy transformation: A roadmap to 2050*** *(2019 edition), report from the International Renewable Energy Agency IRENA*

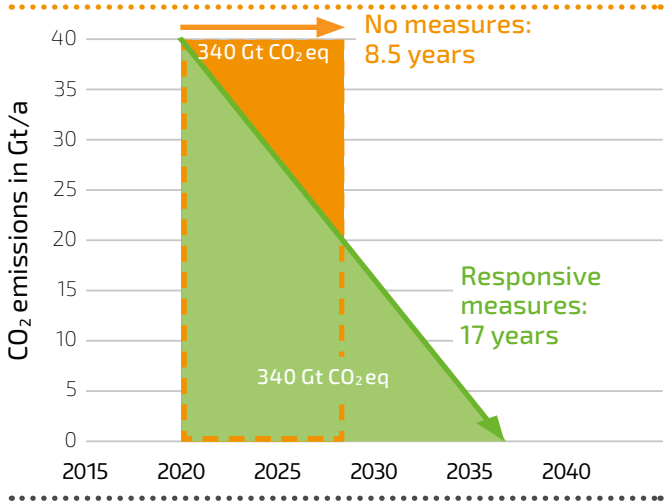
# Time pressure is the key parameter driving action

Drought, forest fires, record-breaking heat: climate change has long been underway. That is why the global community has committed to keeping the increase in average global temperatures well below 2 °C and, if possible, limiting any rise to 1.5 °C above the pre-industrial level. This means that only a limited volume of greenhouse gases can still be emitted into the atmosphere. Only 340 gigatonnes of $CO_2$ eq. may still be emitted worldwide. This $CO_2$ budget will be used up as early as 2029 unless measures to mitigate climate change are enhanced significantly worldwide. The figures indicate the rapid pace needed in annual reductions of global $CO_2$ emissions. **That makes clear: we must use all the instruments available immediately!**

Against this backdrop, in December 2020 the European Union (EU 27) adopted a climate change mitigation target of 55 percent greenhouse gas reduction by 2030 compared to 1990.

Climate neutrality is to be achieved by 2050, i.e. at the latest in 2050 the general rule will be that only as much greenhouse gas may be emitted into the atmosphere as has previously been removed. In this context, sticking to the $CO_2$ budget over the next decade goes hand in hand with attaining climate neutrality in 2050.

## WHEN WILL THE $CO_2$ BUDGET FOR THE 1.5° C TARGET BE EXHAUSTED?




Source: Prof. Dr. Willner, HAW Hamburg, Climate Protection in the Transport Sector – The Key Role of Alternative Fuels, p. 280 ff.

*"Consumers love rapeseed honey and livestock love protein-rich rapeseed meal. Human diets also benefit from meat, milk or eggs. Therefore, we call on politicians to finally recognize the benefits of biofuels for climate change mitigation and for the entire agricultural value chain."*

***Jaana Kleinschmit von Lengefeld,*** *President, OVID Association of the Oilseed Crushing and Vegetable Oil Refining Industry in Germany*

*"Biofuels are emblematic of the close interlinking along the entire commodity chain, from cultivation and harvesting to processing. I would describe that as a transparent bioeconomy in action. The statutory requirements for sustainability, greenhouse gas reduction and certification constitute the shared framework."*

***Detlef Kurreck,*** *Chairman, Union for the Promotion of Oil and Protein Plants (UFOP)*

*"One advantage of German biodiesel production has to date largely been disregarded: glycerine is produced at the same time as a valuable by-product, used for many applications in everyday life and has completely sidelined glycerine from fossil sources. It is found in tablets, toothpaste, disinfectants and many other products."*

***Stefan Schreiber,*** *President, Association of the German Biofuel Industry (VDB)*

*"If over two-thirds of Germans are in favour of biofuels, politicians should take this into account and envisage increased use of certified sustainable bioethanol in road transport in order to achieve the climate targets. Most Germans view a mix of drive solutions as the best way forward."*

***Norbert Schindler,*** *Chairman, German Bioethanol Industry Association (BDBe)*

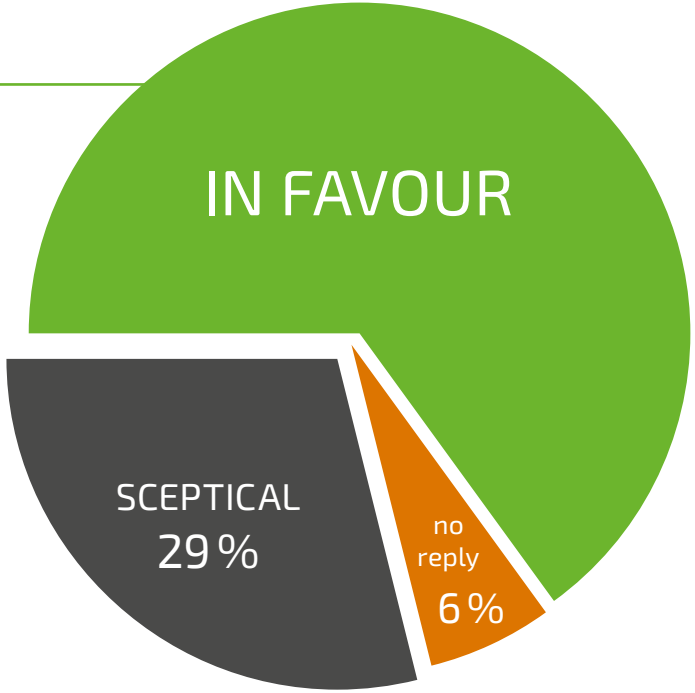
# 2020 Survey

In summer 2020, the market research institute KANTAR polled 1,011 respondents aged 14 or over and resident in Germany about their attitudes towards biofuels. This representative survey was commissioned by the German Bioethanol Industry Association (BDBe), the Association of the Oilseed Processing Industry in Germany (OVID), the Union for the Promotion of Oil and Protein Plants (UFOP), and the Association of the German Biofuel Industry (VDB). KANTAR put questions by telephone to participants selected by random sampling to ascertain public views on biodiesel, bioethanol and biomethane.

# 65 %

**of the population have a generally positive view of biofuels.**

Most people in Germany (65 percent) have a fundamentally positive view of biofuels, while just under a third of respondents are sceptical. Protection of the environment and resources is the main reason cited for a generally favourable view, while critical assessments are most frequently substantiated by concerns about wasting land that could be used to grow food.



## WOULD YOU FILL YOUR TANK WITH BIOFUELS?

... if biofuels are guaranteed to emit at least 60 percent less greenhouse gases than fossil fuels and if their production is certified as "sustainable".

YES, DEFINITELY
**37 %**

PROBABLY
**32 %**

**I.e., more than 2/3 would fill up with biofuels**

67 percent of those surveyed would tank up with sustainably produced biofuels if there were a guaranteed greenhouse gas reduction of at least 60 percent compared to mineral oil. With that scenario, even over 50 percent of sceptics would be inclined to accept biofuels.

One thing many people do not realize: sustainability certification and greenhouse gas reduction are already legal requirements – some biofuels reduce greenhouse gas emissions by over 90 percent.

## ONE IN FOUR CRITICS WANT HIGHER BIOFUEL BLENDS

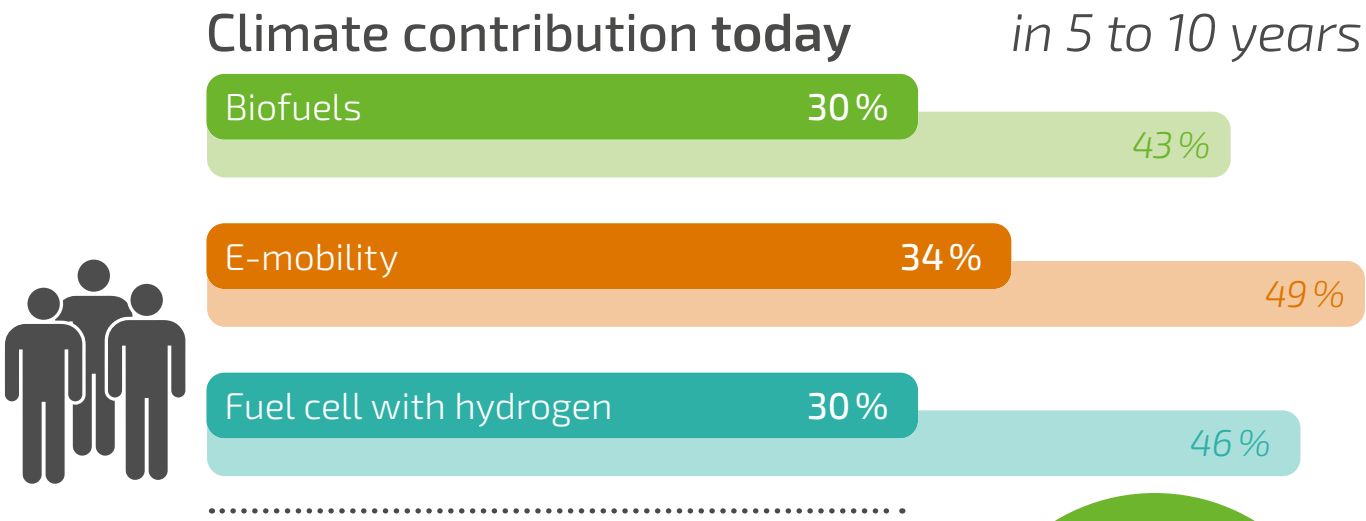

... of all critics consider the **current admixture levels** for biofuels as **too low.**

They would like to see a **higher** proportion of up to 100 %.

According to the survey, only one third of respondents are sceptical about biofuels, many of them on the grounds that the proportion of renewables in blends is too low. One in four critics would like to see a higher proportion of bioethanol or biodiesel and even call for a 100 % biofuel mix.

# CONSUMERS EXPECT CLIMATE-FRIENDLY DIVERSITY IN THE TRANSPORT SECTOR

In your opinion, how much do the following drive concepts already contribute to reducing greenhouse gases **today*** and how much will they contribute **in 5 to 10 years***?




*Total responses for "high contribution" and "very high contribution".

Many consumers have long recognized that only a diverse and sustainable mix leads to climate-friendly motorization. They estimate the climate change mitigation contribution of biofuels in five or ten years' time as equivalent to that of hydrogen fuel cells and only slightly lower than that of e-mobility.

*Unlike politicians, most consumers have recognised the growing importance of biofuels.*

# Biofuels' Economic Significance

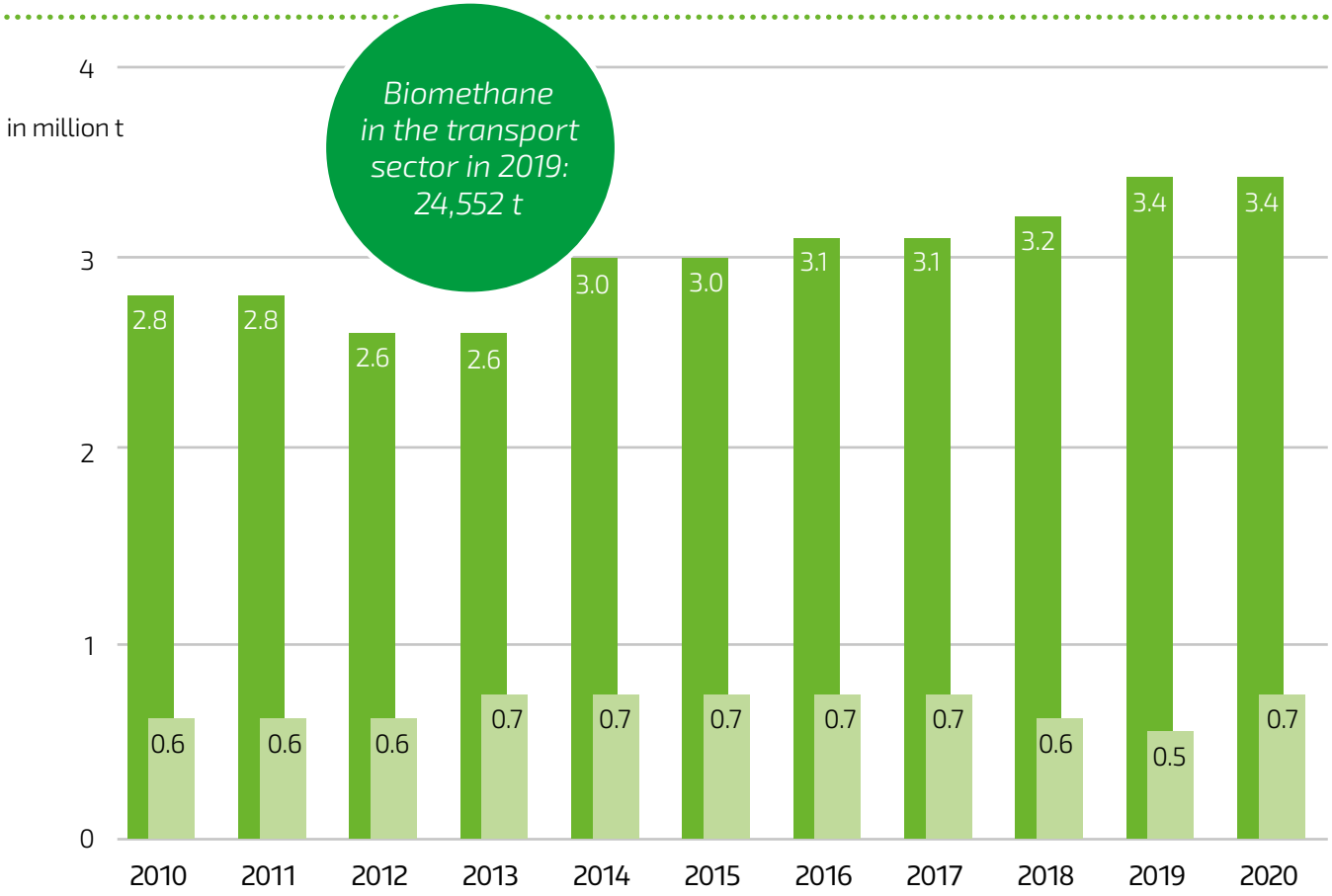
The biofuel industry generates economic stimuli of over 2.8 billion euros per annum in Germany (*ZSW 2020*). **Around 22,000 people work directly or indirectly in the German biofuels sector – many in rural, structurally weak regions.** They are often employed in one of the country's 36 biofuel plants, which in 2020 produced around 3.4 million tonnes of biodiesel, 700,000 tonnes of bioethanol and 24,552 tonnes of biomethane (equivalent to around 34 million cubic metres). When agricultural feedstocks are used for biodiesel and bioethanol, **valuable protein feed is produced as a by-product** and plays an indispensable role both for milk production and in pig and poultry rearing. This reduces the need for soybean imports.

An important by-product of biodiesel production is glycerine, which is used inter alia in tablets, creams and foodstuffs. The biofuel industry's flexibility became apparent when the COVID-19 pandemic began: within just a few weeks, several bioethanol producers switched operations on the bulk of their production lines to ensure they could supply the disinfectants that were suddenly in great demand.

**Tried-and tested infrastructure and logistics already exist for nationwide use of biofuels.** This offers immediate advantages over electromobility, as the charging station network is still in the early development phase.

Under the EU Effort Sharing Regulation, biofuels already reduce Germany's need for $CO_2$ emission rights. These would otherwise have to be purchased from other EU Member States. As a result, **biodiesel, bioethanol and biomethane will save the federal budget up to 10 billion euros in expenditure by 2030** *(Source: DIW).*

# DOMESTIC PRODUCTION OF **BIODIESEL** AND **BIOETHANOL** SINCE 2010




Sources: VDB, BDBe, (biomethane: BLE), figures rounded.

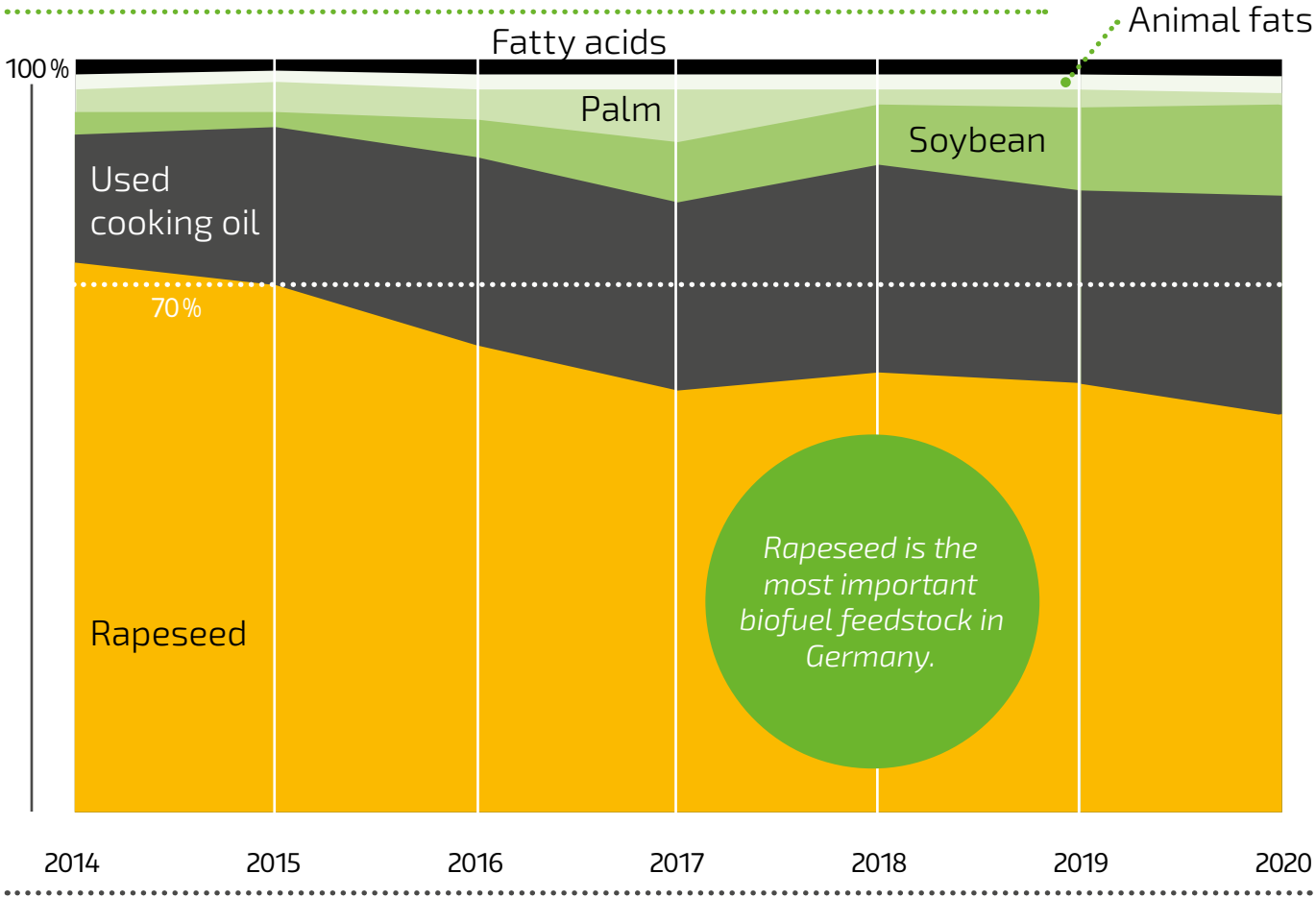
# Feedstocks for biodiesel

**The most important feedstock for biodiesel production in Germany is rapeseed, accounting on average for over 60 percent for many years.** More than 25 percent of the inputs in Germany are used cooking oils. Their share has risen significantly in recent years. Palm oil (3.9 per cent) and soybean oil (6 per cent), on the other hand, play a subordinate role. As a result of implementation of RED II in 2021, biodiesel from animal fats, which has to date been available in other EU Member States, can now also be used on the German market.

**It is a fact: agricultural feedstocks for biofuel production must be grown sustainably.** The Biofuel Sustainability Ordinance (2009) stipulates that feedstocks must not come from former rainforest areas, grassland or peat bogs. The cut-off date is 01.01.2008: biofuels from feedstocks produced on land that was cleared or drained after that date may not be counted towards an energy quota obligation or greenhouse gas quota (as in Germany) in the EU. Due to the introduction of certification, feed generated as a by-product of biofuel production is also certified as sustainable. Independent, certified auditors authorized by the certification system monitor worldwide compliance with the provisions stipulated in EU legislation. The European Commission is responsible for approval of the certification systems. Consequently, the entire production chain, from cultivation to biofuel production, is certified and the industry is a pioneer on the sustainability front. In addition, there is a legal requirement to provide proof of at least 50 percent greenhouse gas savings compared to fossil fuels.

Biofuels can actually reduce $CO_2$ emissions by up to 93 percent, depending on the feedstock used; **in 2019, the average saving achieved by all biofuels deployed in Germany was 83 percent (BLE 2020).**

# FEEDSTOCK SHARE IN GERMAN BIODIESEL (IN %)

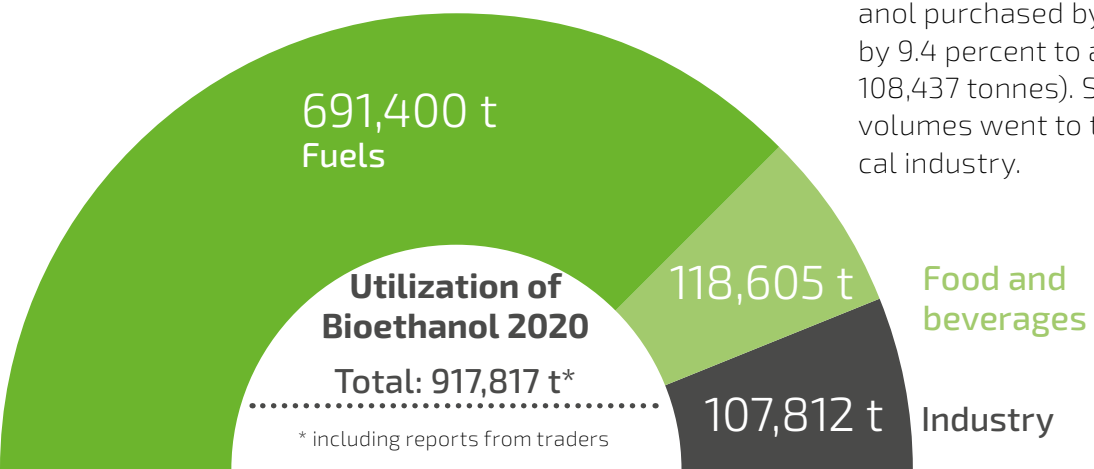


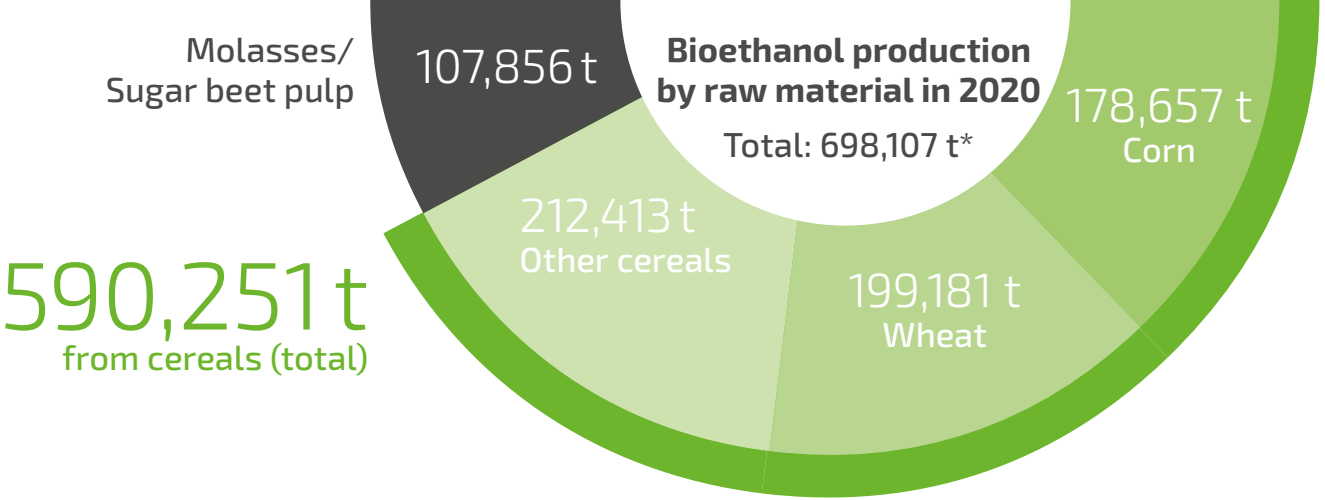

Source: VDB

# FEEDSTOCKS FOR BIOETHANOL

In Germany, bioethanol is produced primarily from sugar beet and cereals. In 2020, 700,000 tonnes of bioethanol were produced in Germany from these feedstocks. This represents an increase of 7.1 percent compared to the previous year. In addition, a small proportion of bioethanol is produced from residues and waste materials, although a precise percentage is not indicated in the figures from the Federal Office for Food and Agriculture (BLE). Bioethanol is used in the fuel, food and beverage sector as well as in the chemical and pharmaceutical industries. During the coronavirus pandemic in 2020, German producers also supplied the raw material for disinfectants.

In a fuel market that shrunk dramatically in 2020 due to the pandemic, with gasoline sales of 16.2 million tonnes, almost 10 percent lower than the previous year (2019: 18.0 million tonnes), domestic consumption of bioethanol fell only slightly. The amount of bioethanol destined for blending for fuel applications in 2020 increased by 27.4 percent to 691,400 tonnes (2019: 542,699 tonnes). The volume of bioethanol purchased by the food industry also rose by 9.4 percent to almost 118,605 tonnes (2018: 108,437 tonnes). Slightly lower bioethanol volumes went to the chemical and pharmaceutical industry.






590,251 tonnes of bioethanol were produced from feed grain (+ 5.2 percent compared to 2019). Around 2.5 million tonnes of feed grain served as inputs for this production. That corresponds to only 5.8 percent of the 2020 German grain harvest of 43.2 million tonnes.

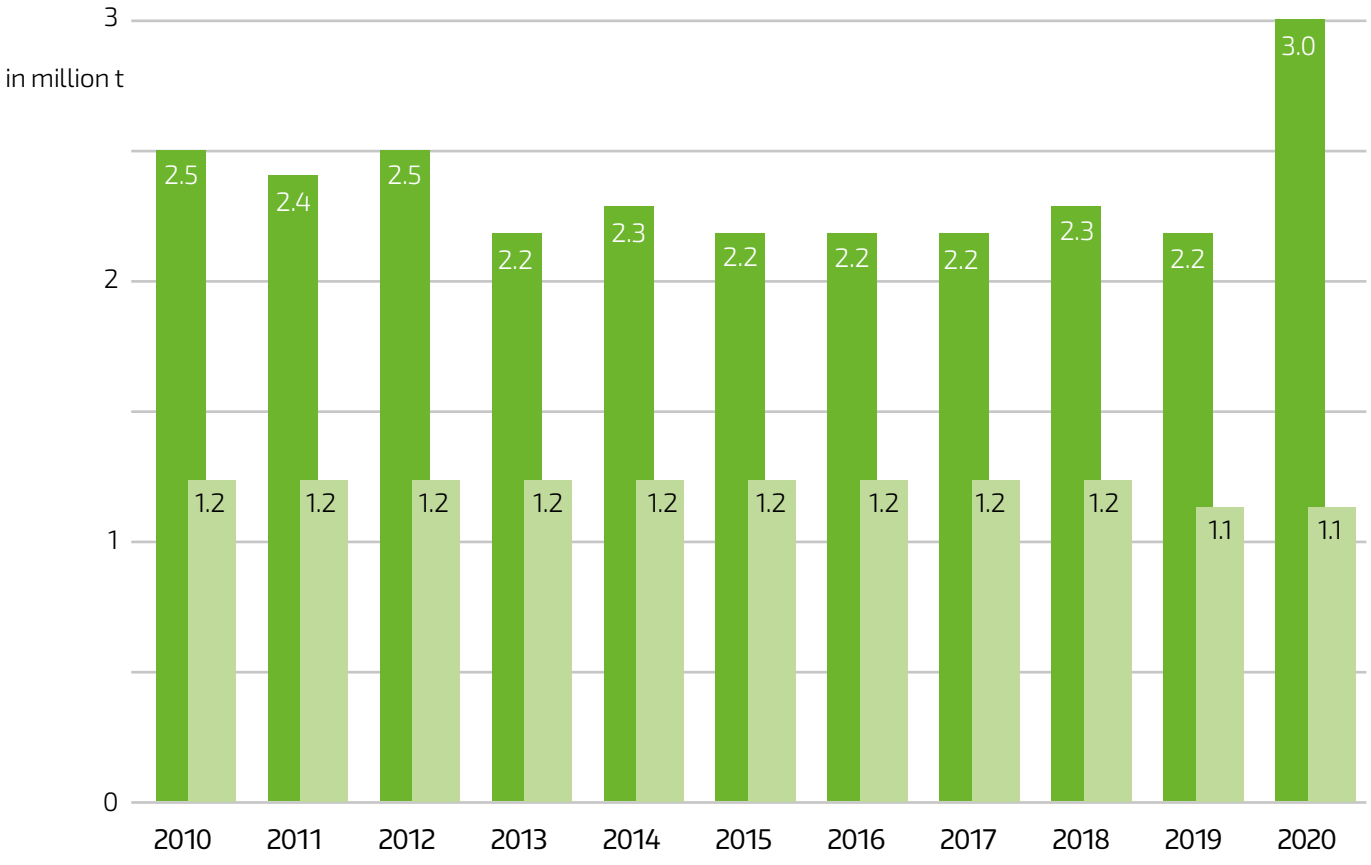
The raw materials for all of Germany's bioethanol production were cultivated on 350,000 hectares. That corresponds to 3 percent of Germany's total arable land.

In addition to bioethanol, the other plant components of the processed feedstocks provided proteins, fibre, minerals and vitamins, which were processed into high-quality co-products: protein feed from feed grain, concentrated feed from sugar beet and other products for the food and feed industry, gluten for aquaculture and biogenic carbon dioxide for beverages.



* Total excluding residues and waste materials, not indicated for reasons of antitrust law

## SALES OF **BIODIESEL** AND **BIOETHANOL**




Sources: VDB, BDBe, BAFA, figures rounded.

# Possible Uses (B7, B100, E5, E10, E85)

Biodiesel, bioethanol and biomethane are marketed as standardized fuels. That guarantees they can be used safely and without technical problems. **The higher the admixture, the greater the positive effect for the climate.**

Biodiesel:

- B7: Permissible admixture of biodiesel to fossil diesel with a maximum share of 7 % (by volume) of biodiesel (DIN EN 590).
- B10: Permissible admixture of biodiesel to fossil diesel with a maximum share of 10 % (by volume) of biodiesel (pursuant to DIN EN 16734).
- B20/B30: Permissible admixture of biodiesel to fossil diesel with a maximum share of 20 % (volume) or 30 % (volume) biodiesel (DIN EN 16709)
- B100: pure biodiesel (DIN EN 14214)

Biomethane:

- Biomethane as pure fuel or blended with compressed natural gas (CNG) (DIN EN 16723-2).

Bioethanol:

Fuels that comply with DIN EN 51625 and DIN EN15376.

- E5: Permissible admixture of bioethanol with fossil petrol with a maximum proportion of 5 % (by volume) ethanol (DIN EN 228).
- E10: Permissible admixture of bioethanol to fossil petrol with a maximum proportion of 10 % ethanol (by volume) (DIN EN 228).
- E85: Permissible admixture of bioethanol to fossil petrol with a maximum proportion of 85 % (by volume) ethanol (DIN EN 15293)

**In the medium term, higher biodiesel blends should also be permitted for sale at public filling stations and in the transport sector,** such as the already standardized blends B10, B20 or B30. The standardization process for gasoline with a higher admixture level (E20) is currently underway.

# GHG quota

**Biofuels have saved around 50 million tonnes of $CO_2$ since the greenhouse gas reduction quota (GHG quota) was introduced in 2015.** This quota is not about a specific amount of energy or fuel to be used. Instead, the quota obliges the mineral oil industry to reduce the greenhouse gas emissions of the fuels they put on the market, in 2020 by 6 percent. To achieve this, firms may use biodiesel, bioethanol or biomethane as well as electromobility or hydrogen.

The lower the greenhouse gas emissions of the alternative used, the faster the oil companies will achieve the stipulated reduction and will need to use a smaller volume of biofuel. Therefore, firms are interested in purchasing the available biofuels on the basis of their price and contribution to greenhouse gas reduction. This creates competition to produce the biofuel that emits the least level of greenhouse gases.

**One point that should be viewed with a critical eye that until 2026, the mineral oil companies have the option to meet up to 1.2 percent of their obligation by crediting measures that reduce greenhouse gas emissions during oil production. One example of these upstream emission reductions (UER) is the burning of associated gas (methane) that escapes during production (flaring).** This means that greenhouse gas reductions in Siberia or Nigeria can also be credited towards the GHG quota obligation without reducing GHG emissions from road transport in Germany.

Fuel distributors obliged to meet the GHG quota can also trade greenhouse gas reductions with each other, if, for example, more biofuel is purchased than is needed. That gives them greater flexibility in meeting the quota. Prices for a tonne of $CO_2$ savings traded between companies fluctuate from 150 to 400 euros. **Market-driven emissions trading is already taking place in this context.**

This demonstrates that the cost of greenhouse gas avoidance is much higher in the transport sector than in sectors covered by the European Emissions Trading Scheme (industry, power generation). Prices in these sectors are around 50 euros per tonne of $CO_2$ (2020) and the trend is upwards.

Due to significantly improved performance in greenhouse gas reduction, smaller quantities of biofuels are required to meet the GHG reduction target of 6 percent in 2020. **Conversely, more climate change mitigation can be achieved with the same amount of biofuel.** It therefore makes sense to use this potential by increasing the GHG quota to attain a directly effective and thus more impactful contribution to climate protection. A further argument in favor is that no additional infrastructure is required, in contrast to e-mobility or hydrogen.

**Calculation of the GHG quota:**

The mineral oil companies multiply the energy of the fuels they place on the market (diesel, petrol, biofuels, etc.) by a "fossil fuel reference value". This corresponds to the European fuel mix in 2010 and is 94.1 g $CO_2$ /GJ. The mineral oil companies must reduce this computed value through emission reductions (biofuels, green hydrogen, electromobility, UER), currently by 6 percent, from 2022 by 7 percent, steadily increasing to 25 percent by 2030.

# Climate-friendly Transport without Multiple counting

In spring 2021, the German Bundestag passed the "Act on Further Development of the Greenhouse Gas Reduction Commitment – GHG Quota".

1. The legislation provides for the following provisions
   - continuing rise in the GHG quota (in %)

| 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|
| 6 | 7 | 8 | 9.25 | 10.5 | 12 | 14.5 | 17.5 | 21 | 25 |

**However, the higher quota levels do not reflect the actual physical contribution to greenhouse gas savings, as provisions for multiple offsetting are envisaged in seeking to attain the GHG quota:**

   - Electric mobility: 3-fold credit
   - Green hydrogen used in petroleum refineries: 2-fold credit
   - Green hydrogen as fuel as well as PtX (Power to Gas or Power to Liquid): 2-fold credit
   - Biofuels from straw, manure, nutshells, etc. (Annex XI, Section A, RED II) must make up a defined minimum share. Greenhouse gas reductions in excess of this sub-quota are counted twice towards the GHG quota; this applies indefinitely.

2. Until 2030, a maximum contribution to climate change mitigation of 4.4 percent of final energy consumption is stipulated for biofuels from cultivated biomass. Biofuels from palm oil may only be credited towards the GHG quota until 2022.

3. Crediting of biofuels from used cooking oils and animal fat is restricted to at most 1.9 percent of final energy consumption.

4. The GHG quota is to be increased to compensate for more rapid ramp-up of electromobility.

## Criticism:

1. The GHG Quota Act envisages multiple counting (electomobility, Hydrogen etc.). This waters down its contribution to climate change mitigation. Only actual physical $CO_2$ savings limit increases in greenhouse gas emissions.

2. While the GHG quota rises steadily over time, there is reason to fear that today's biofuels will be squeezed out of the market by electromobility, as a result of multiple counting and the sharp rise in vehicle registration numbers. Against this backdrop, the automatic increase in the GHG quota stipulated in the relevant legislation must therefore always be implemented promptly. The aim must be to ensure compliance with the rising GHG quota, in the best-case scenario by deploying all the options, such as renewable hydrogen and synthetic fuels, which are being promoted by the German government with considerable financial resources. The key parameter for climate change mitigation is the actual tangible contribution to GHG reduction.

3. This also applies to the sub-quota for advanced biofuels (Annex IX, Section A): their potential must be mobilized through more pronounced increases in the sub-quota by 2025 and by raising the target to be attained to 3.5% in 2030.

# Environmentally-friendly Production Chain

Each stage of the biofuel production process is included when calculating the greenhouse gas balance of biodiesel, bioethanol and biomethane. Regardless of whether the raw materials are grown in Germany or on another continent, the calculation factors in cultivation, the feedstocks used, transport and processing.

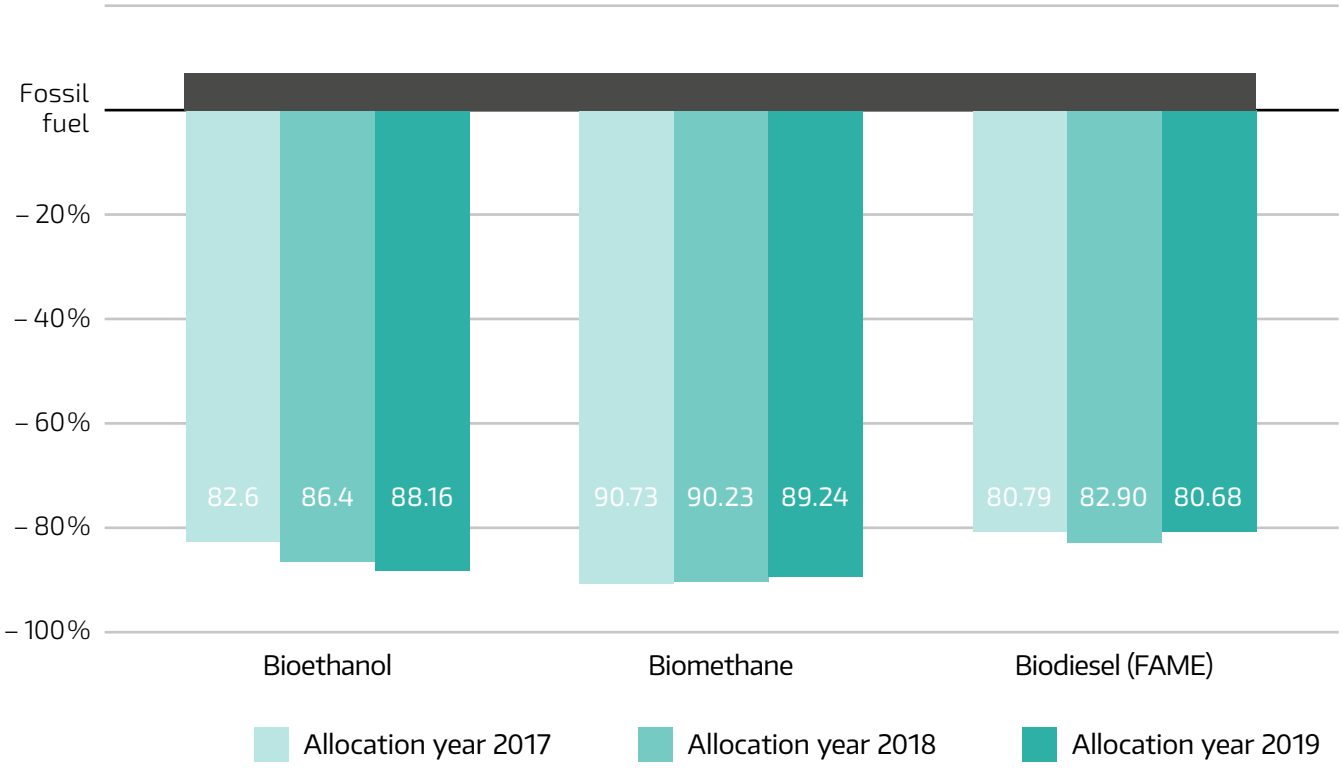
**Firms producing biodiesel, bioethanol and biomethane are in fierce competition to achieve the lowest greenhouse gas emissions.**
There are multiple optimisation options:

» Using combined heat and power (CHP).
» Improved insulation of heating pipes
» Utilizing more efficient machinery
» In-house power supply based on renewable energy sources
» Shorter transport routes
» Reduced fertiliser consumption
» Use of biofuels in agriculture
» Reducing emissions through
  • Carbon capture and geological storage (CCS)
  • Use of $CO_2$ in other applications (CCU, e.g. fertilization in greenhouses, use in the beverage industry)

Non-governmental organizations have criticized "indirect" changes in land use due to demand for biofuel feedstocks, thus leading to high additional $CO_2$ emissions (indirect land use change, iLUC). However, the Intergovernmental Panel on Climate Change (IPCC) has also called this effect into question. The EU has resolved the problem by introducing a maximum eligible level for biofuels' contribution to decarbonisation of the transport sector and by phasing out the use of feedstocks with a high iLUC risk by 2030 at the latest. **The German Advisory Council on Global Change (WBGU) also recommends extending the tried-and-tested approach of sustainability certification for biofuels to all other uses of cultivated biomass.**

# BIOFUELS' CONTRIBUTION TO CLIMATE CHANGE MITIGATION

Average emission savings (in %) compared to reference fossil fuel




Source: BLE Evaluations- und Erfahrungsbericht 2019, p. 65.

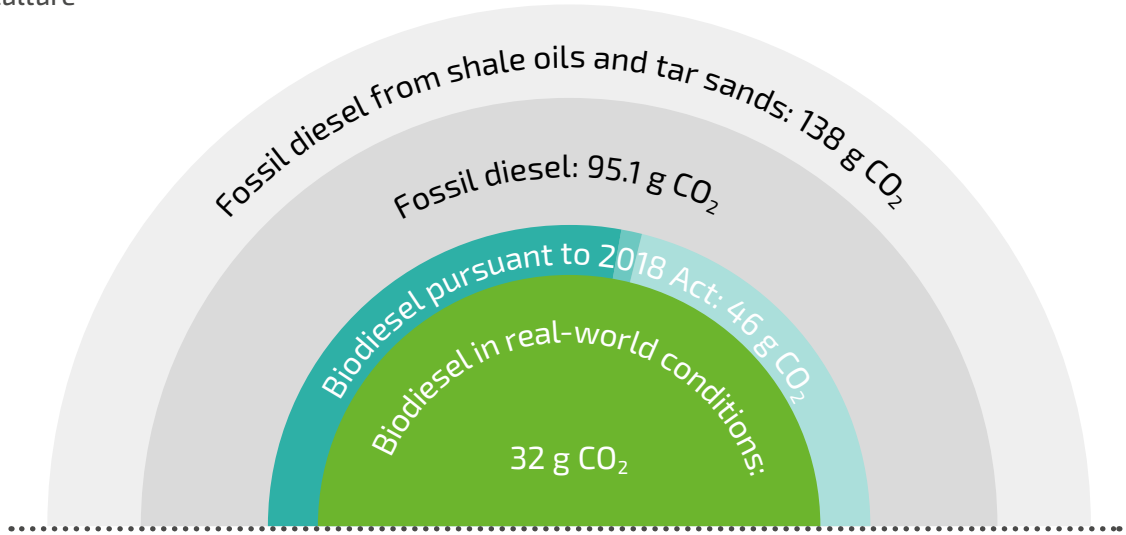
# GHG EMISSIONS FROM BIOFUELS (USING BIODIESEL AS AN EXAMPLE)

Greenhouse gases are generated during production, processing and transport of biodiesel. The figure shows GHG emissions of biodiesel (from rapeseed) compared with fossil fuel.

**56 %**
Crop cultivation and agriculture*

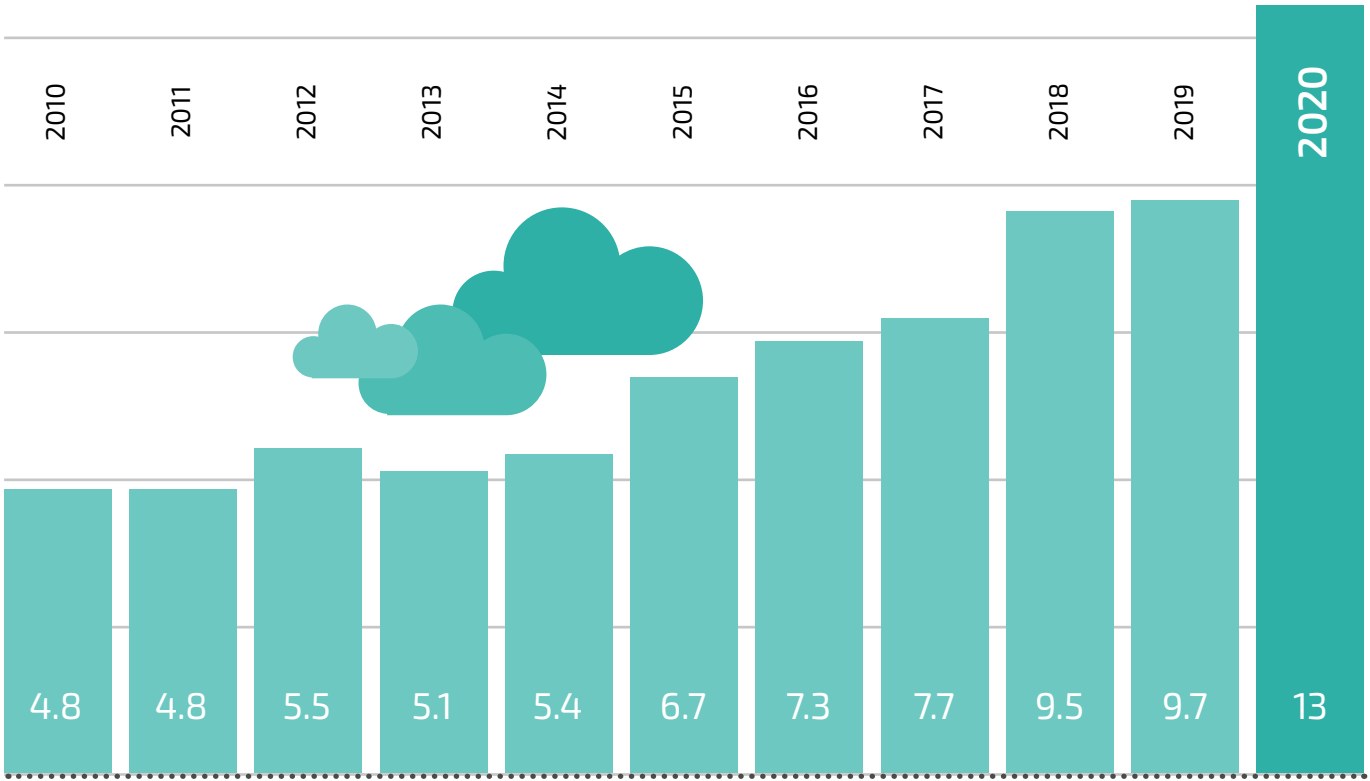
**2 %**
Transport*

**42 %**
Processing*




* Standard values

# $CO_2$ SAVINGS THROUGH BIOFUELS IN MILLION TONNES.




Sources: BMWi /Federal Ministry of Economics and Technology, UBA / German Environment Agency, AGEE-Stat, BLE / Federal Office for Agriculture and Food (for 2020: UFOP estimate)
Evolution of greenhouse gas reduction quota (GHG quota): 2015: 3.5 %; 2017: 4 %; from 2020: 6 %. Fossil fuel reference value until 2018: 83.8 g $CO_2$ eq/MJ, thereafter 94.1 g $CO_2$ eq/MJ.

# Land Use for Biofuels

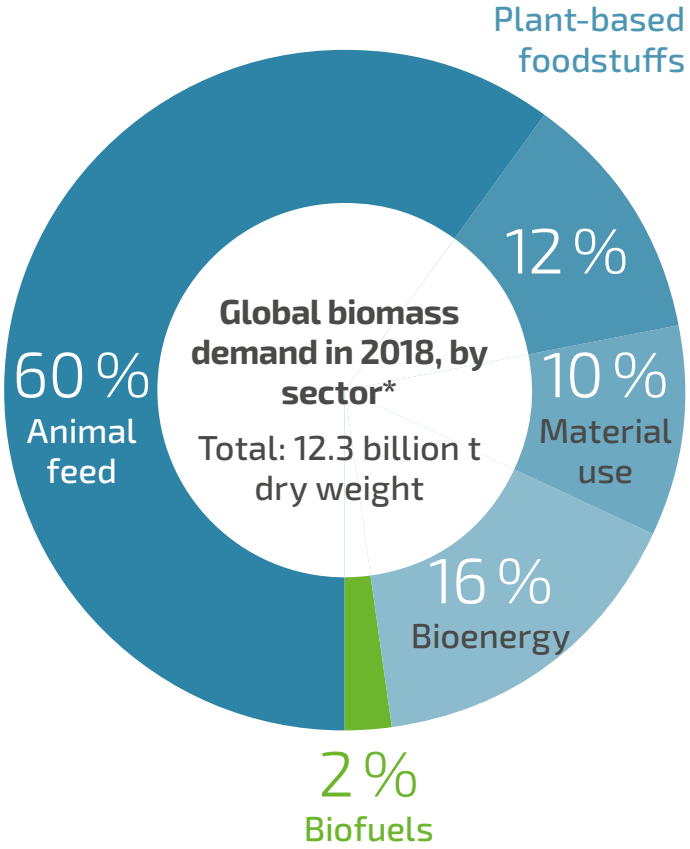
**Feedstocks for biofuel production constitute only 2 percent of global demand for biomass for various uses. The area** required for this is correspondingly small, in Germany as elsewhere. Rapeseed, cereals and sugar beet are grown on around 810,000 hectares for biodiesel and bioethanol production. That corresponds to only 7 percent of the approximately 11.7 million hectares used for arable farming in Germany.

It is important to bear in mind that biofuel production during processing of rapeseed and cereals also produces large quantities of protein feed, helping to cut imports of soy from overseas.

**Area under cultivation for biofuels in Germany**

| *in ha* | 2018 | 2019 | 2020 |
|---|---|---|---|
| Rapeseed oil for biodiesel/ vegetable oil | 589,000 | 520,000 | 575,000 |
| Crops for bioethanol | 266,000 | 290,000 | 207,000 |
| | **855,000** | **810,000** | **782,000** |

Source: FNR / Agency for Renewable Resources




Hauptbericht, Wissenschaftliche Beirat der Bundesregierung Globale Umweltveränderungen /German Advisory Council on Global Change (WBGU), November 2020, p. 212

# Role of Biofuels for Glycerine and Disinfectants

» Glycerine is a valuable by-product of biodiesel production.

» The transparent and odourless liquid is a vital ingredient in medicines, cosmetics, antifreeze and lubricants, as well as in food.

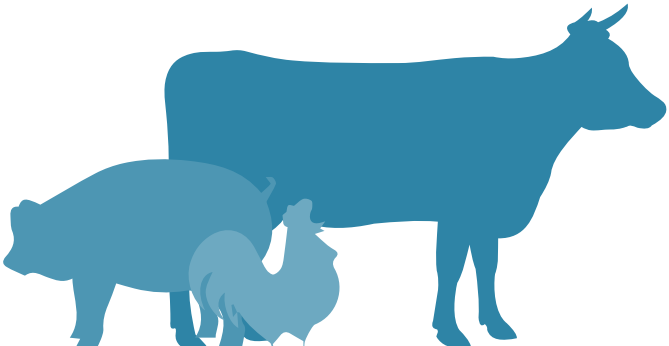
» Annual production of 3.4 million tons of biodiesel in Germany gives rise to around **340,000 tons of glycerine**. The vegetable oil-based, domestic feedstock has by now almost completely replaced crude-oil-based glycerine.

» In addition to glycerine for hand disinfection, bioethanol is also used to manufacture disinfectants.

» Bioethanol has a typical alcohol purity of 99.5 – 99.9 percent and is therefore effective against microorganisms and viruses – perfect for use in hospitals or for sale in pharmacies.

# Biofuel Production and Animal Feed

Protein feed is indispensable in rearing cattle, pigs and poultry. Much of the demand is met by imports of soybeans or soybean meal from overseas. The protein feed produced while making biofuels considerably reduces the need for imports, with rapeseed meal the most important protein feed that arises in this process. During biodiesel production, around 60 per cent of the rapeseed input is turned into meal, while 40 per cent of the rapeseed grain serves to make vegetable oil for biodiesel. Rapeseed from the European Union is grown without genetically modified. Producing bioethanol from grain also generates protein-rich animal feed in the form of dried sillage.



**In total, biofuel and animal feed production in Germany means import savings of around 2.4 million tonnes of soybean meal.** That helps conserve valuable and sensitive ecosystems in soybean producing countries. This is why biofuel and protein animal feed production are inextricably linked.

**A key point to remember is that rapeseed and sugar beet are a good supplement to crop rotations with a high proportion of cereals,** improve the humus balance with their biomass remaining on the field after harvesting and thus also contribute to carbon storage as a further facet of climate protection. As a flowering plant, oilseed rape is an attractive addition to the landscape in spring and is the most important forage plant for bee colonies and thus for honey production.

*Rapeseed meal is the most important domestic protein feed.*

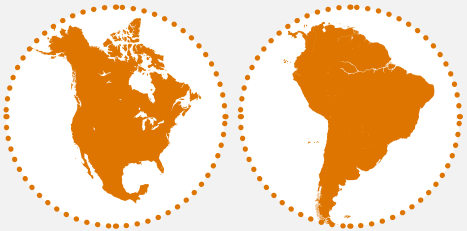
# DOMESTICALLY PRODUCED BIOFUELS AVOID SOY IMPORTS

Without co-products from domestic biofuel production, Germany would need to import around 50 percent more soybean-based feed.

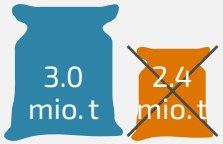
Area under cultivation in 2020: 1.7 million ha (e.g. rapeseed, feed grain, sugar beet)

European cultivation

Imports



2020:
2.6 million t of biofuels




2020: 3.0 million t of feed from co-products of domestic biofuel production replace 2.4 million t of soybeans,which means 1.0 million ha less soybean cultivation.


2020: 2.5 million t of feed from soybeans

Sources: AEE, UFOP, BDB[e], BMEL, OVID

# Biofuels Are Crucial to Low-emission Mobility

The transport sector is the problem child of the energy transition. Biofuels offer hope. For years, they have been the only widely available alternative to fossil petrol and diesel.

**Biodiesel, bioethanol and biomethane currently supply around 98 percent of the renewable energy used in road transport.** In seeking to achieve extensive defossilization of the transport sector, they thus form the crucial foundation for development of other renewable fuels and alternative drive systems. Overall, these fuels account for 5.6 percent of total energy consumption in road, rail and air transport in Germany.

Biofuels account for 7 percent of the total energy supplied by renewable energies (2019). The **share of biodiesel, bioethanol and biomethane can be gradually increased to boost climate change mitigation.**

It will probably only be possible after 2030 to use significant quantities of green hydrogen and electricity-based synthetic fuels (e-fuels). The legislation stipulates a statutory obligation for these fuels to be blended with kerosene from 2026 and provides that the requisite production capacities must be put in place by then.

Avoiding traffic and shifting to other modes of transport such as rail, inland waterways, local public transport, cycling and walking are also essential to help cut greenhouse gas emissions in the mobility sector.

**All these measures must be implemented in conjunction to meet the Federal Government's ambitious targets.**

*Gradual increases in the proportion of biodiesel, bioethanol and biomethane help to further mitigate climate change.*

# Biofuels in Road Transport – 2020 and 2030

At present, electromobility is being promoted vigorously in the hope of rapid emission reductions in the transport sector – inter alia through purchase premiums, tax incentives and state-driven development of charging infrastructure. As a result, the proportion of electric vehicles amongst new cars is currently rising rapidly. It is anticipated that up to 15 million electric vehicles will be registered in Germany by 2030. **However, biodiesel, bioethanol and biomethane must continue to play an important role in the energy mix in the transport sector to ensure that in 2030, the roughly 38 million passenger cars with internal combustion engines run with the lowest possible greenhouse gas emissions.**

In addition, it will be some time before battery technology is sufficiently advanced for heavy commercial vehicles such as trucks to operate with electric motors.

**In this context in particular, electrification is running up against cost constraints and the boundaries determined by the laws of physics.** Trucks, buses or agricultural machinery have a high and constant power requirement given the range required for transportation purposes or the tractive power needed for ploughing. **Biofuels offer a multi-purpose, cost-effective option for reducing greenhouse gases that is already available today.**

If the energy produced by the German biofuel industry were to be replaced by electricity generated by new wind farms, around 7,300 additional modern wind turbines would have to be built. However, only 425 new wind turbines were constructed in Germany in 2020, with existing stock of just under 30,000 turbines (onshore).

**One thing is crystal clear: today and in the post-2030 period, biofuels are an important and indispensable alternative to fossil fuels when it comes to achieving the climate targets in the transport sector.**

# Biofuels in the Context of Statutory Provisions

Biofuels legislation is embedded in a wide range of standards and legislation on future mobility. These include:

» Effort Sharing Regulation (ESR) – sets binding $CO_2$ reduction targets for EU Member States by 2030 for the building, transport, agriculture and waste management sectors. Provisions in the current version stipulate that Germany must reduce its emissions by 38 percent compared to 2005 levels. If this target is not met, the German government will be obliged to purchase additional pollution rights.

» German Climate Protection Act (KSG) – stipulates that $CO_2$ emissions in the transport sector must be reduced from the current level of around 150 million tonnes to 85 million tonnes by 2030; if this is not reached, the sector faces the threat of emergency measures.

» European $CO_2$ fleet limits – the target average set for new cars is 95 g $CO_2$/km for 2020 and is to be increased dramatically by 2030.

» German Fuel Emissions Trading Act (BEHG) – establishes rising $CO_2$ prices for the period up to 2026. Biofuels are exempt from the pricing system, while gasoline and diesel will become more expensive due to the $CO_2$ price.

**$CO_2$ pricing of fossil diesel and petrol (pursuant to § 10 BEHG)**

| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026* |
|---|---|---|---|---|---|---|
| Price of emission certificate in € | 25 | 30 | 35 | 45 | 55 | 65 |
| **Diesel in Ct/l** | **6.7** | **8.0** | **9.4** | **12.0** | **14.7** | **17.4** |
| **Petrol in Ct/l** | **6.0** | **7.2** | **8.4** | **10.8** | **13.2** | **15.6** |

*Assumption of maximum price

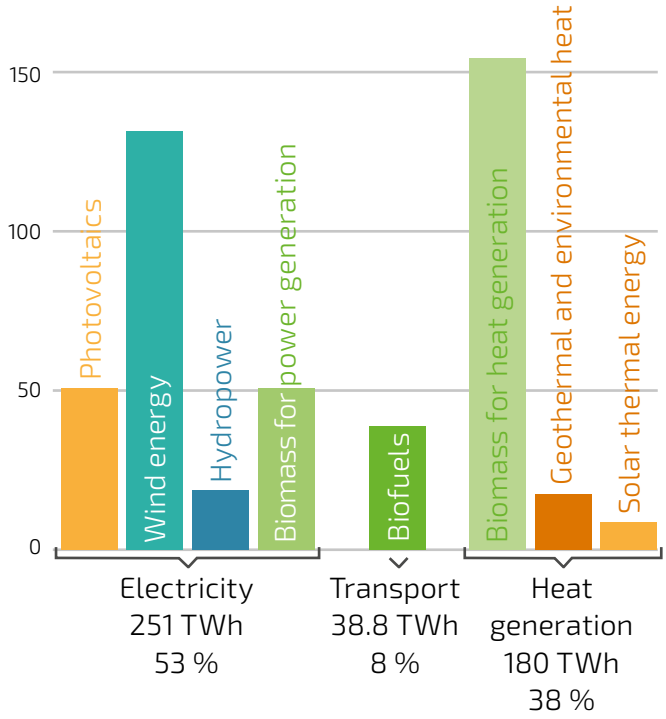
» Ruling by the Federal Constitutional Court of April 2021 – as a result of this ruling, German government policies are now placing greater emphasis on climate change mitigation.

# FINAL ENERGY CONSUMPTION OF RENEWABLE ENERGIES IN THE TRANSPORT SECTOR IN 2020

| Final energy consumption of the transport sector in GWh – 2020 | |
|---|---|
| Biodiesel* | 29,772 |
| Vegetable oil | 10 |
| Bioethanol | 8,088 |
| Biomethane | 884 |
| Electricity consumption for renewable energies in the transport sector | 5,358 |
| **Sum** | **44,112** |
| Share of total energy consumption in the transport sector | 7.3 % |

* incl. HVO | Source: Federal Environment Agency based on data from AGEE-Stat (Working Group on Renewable Energy Statistics)

# ENERGY PRODUCED FROM RENEWABLE ENERGY SOURCES IN 2020* IN TWh (Total: 496.7 TWh)




* provisional figures
Source: Federal Environment Agency based on AGEE-Stat

# Political Demands – Making Biofuel Policy Reliable

The new EU climate law stipulates a binding climate change mitigation target for 2030 of a 55 % reduction in emissions compared with 1990. As a result of the ruling by the Federal Constitutional Court on the German Climate Protection Act, the corresponding target in Germany has already been raised from 55 % to 65 %. Time is the most pressing factor. All the immediately effective options to reduce GHG in the transport sector must be mobilised now (!) in order to achieve the 2030 targets. The regulatory framework for renewable fuels must be adapted to attain further rapid emissions reductions in the transport industry and ensure investment security.

## I. Allow higher blending

Sale of blends with a higher share of sustainably available biofuels must be permitted at public filling stations to tap into their full climate change mitigation potential in the near future. With reference to biodiesel, this means fuel grades B10 for the market as a whole and B30 for commercial vehicles (trucks and buses), while in the case of bioethanol the relevant grade will be Super E20 (once standardization has been completed).

In addition, the petrol grade Super (E5) should be withdrawn from the market – a move successfully implemented in other EU countries – as practically all vehicles in Germany can run on Super E10, while Super Plus (E5) is sufficient as a protective grade for older vehicles.

## II. Counting Biofuels against $CO_2$ Fleet Emission Levels

The vehicle industry must be allowed to count the biofuels the biofuel it uses against the $CO_2$ fleet limit values, in addition to credits for fuels generated using renewable sources of electricity. This will stimulate and accelerate the development of low-GHG fuels for use in the existing fleet. At the same time, measures are needed to ensure that the quantity of emission-reducing alternative fuels to be taken into account is additionally placed on the market.

## III. Introduce $CO_2$-based energy taxation

Energy tax for fuels must shift from a quantity-based approach to $CO_2$-based taxation. Low-$CO_2$ or neutral fuel alternatives would consequently be favored over fossil fuels, with corresponding incentive effects for consumers and producers of renewable fuels.

## IV. Short-term Adjustments to the GHG quota

At the European level, the innovations enumerated in RED III will provide impetus for the future design of climate change mitigation in the mobility sector. In addition, the German Climate Protection Act also makes the GHG reduction targets in the transport sector more stringent. In order to comply with these increasingly demanding climate change mitigation requirements, the GHG quota must be reviewed in the short term. In particular, the multiple offset credits for charging electricity contained in current legislation should be abandoned, as this does not result in any actual GHG reductions. EU proposals for a recast of the Renewable Energy Directive (RED III) already include provisions to this end.

# Further information

**Study: Greenhouse gas savings from biofuels in Germany**
- bit.ly/3rEe3O7

**Study: Biofuels' contribution to achieving the 2030 climate targets *(in German)***
- bit.ly/2NUY3Ym

**Study: Indirect land use changes in life cycle assessments**
- bit.ly/3oRqK9a

**Status report Biodiesel & Co**
- bit.ly/3v0NmEX

**Global Market Supply Report**
- bit.ly/3oVDV97

**Approval list of commercial vehicle manufacturers for operation with biodiesel**
- bit.ly/3Bz9rgk

- www.ufop.de/english/news
- www.ufop.de/english/bio-fuels

www.

- www.epure.org
- www.fediol.eu
- www.copa-cogeca.eu
- www.ebb-eu.org

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