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

Biodiesel 2011/2012

Report on the Current Situation and Prospects – Abstract from the UFOP Annual Report

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Biodiesel & Co.

The extraordinarily robust economic situation in Germany is still continuing. The impact of the European financial crisis is not being felt directly by consumers in this country. Nonetheless, there is much anxiety that the crisis in Greece, Spain, Portugal and Italy will end up affecting all member states of the monetary union. This can be felt on the currency markets. The exchange rate between the dollar and the euro also determines the price development of foodstuffs, consumer goods and in particular, the prices of crude oil and, as a result, fuels. However, consumer behaviour remains untarnished. In the reporting period, analyses of buying behaviour in regard to new cars confirm this. Measured by horsepower performance, as a result of the car scrappage scheme this is increasing constantly after the dip. The individual understanding to make an effort towards climate protection as well as increasing fuel prices don't yet seem to be enough to reverse this buying behaviour. Nevertheless, the European automobile industry is looking anxiously towards the future in light of the dramatically falling figures for new vehicle registrations in Europe.

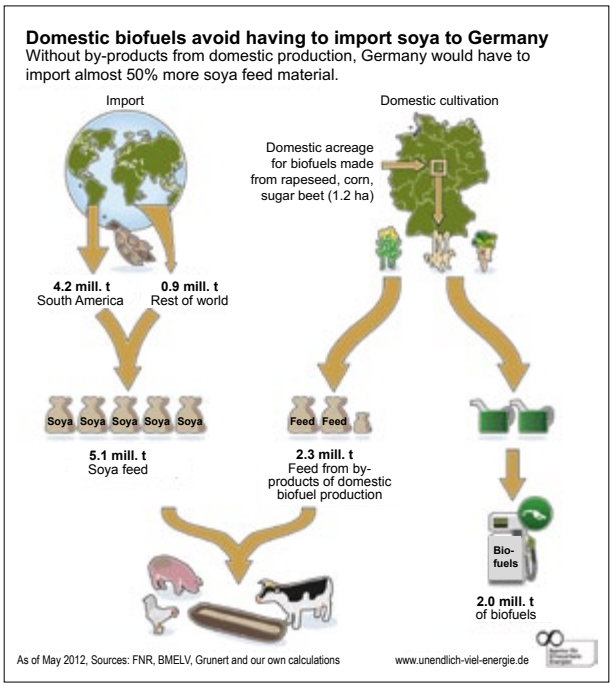
Alternative energy and, in particular, the open questions relating to the acceleration and financing of network expansion determined the political discussion on energy. What triggered the transition to alternative energy in Germany was not climate protection, but the nuclear disaster in Fukushima. However, this event as well as the climate and resources-relevant political goals as the drivers of energy change faded increasingly into the background. For the consumer organisations, the question of justifying the financing is vital to the necessary acceptance in society. For this reason, they focus on their anxiety that it will basically be the family households who end up bearing the costs and will have to finance not just expensive renewable power, but the associated costs and risks of network expansion and offshore wind parks. It is evidently difficult to reach a political consensus on a necessary and urgent strategy taking into account how the German states are affected differently - primarily wind energy in the north, solar energy in the south. The issue of climate protection and diversification of energy supply in relation to gaining wide acceptance is fading increasingly into the background.

Under these circumstances, the importance of bioenergy is also being questioned. It is well known that bioenergy is distinguishable by the fact that it can be stored and is thus base-loadable. It can also be used flexibly in order to cap requirement peaks and, consequently, price peaks. For this reason, UFOP works on the advisory board of the Agency for Renewable Energies (Agentur für Erneuerbare Energien (AEE)) whose task it is to coordinate and implement public relations activities for the entire range of renewable energies in terms of appropriate consumer and media information.

"Food vs. Fuel" debate continues

After the difficult crop year of 2011 in Europe, the unusual drought for the 2012 crop in the USA triggered an intensely fought debate on fears that the corn and maize supply, and thus the food supply for the global market, is not secure. With this in mind, federal development aid minister, Dirk Niebel, demanded an end to the sale of E10. The Federal Government and affected economic organisations were occupied with the extensive, media-controlled reporting as a result of the "Food vs. Fuel" debate triggered in response. Non-governmental organisations and charity associations supported the demand believing that it would bring about fewer additional food price increases. The UN Special Rapporteur on the Right to Food, Olivier De Schutter, feared a new food crisis and demanded that production of biofuel be paused. However, to pacify the biofuels industry the Federal Government made it clear that a change to the biofuels strategy was not on the cards. In this regard, the Federal Ministry of the Environment declared that it would not participate in a debate on discontinuing E10. Fundamentally commendable is the demand of federal development aid minister, Dirk Niebel, to promote

Graph 1: Biofuels avoid soya imports



research into changing biofuels production in the medium to long-term to resources which defuse the conflict potential of "Food vs. Fuel". In the opinion of UFOP this discussion again did not sufficiently consider the fact that in producing biofuels from corn, sugar beet and rapeseed, a considerable contribution to the domestic and European supply of protein feed is made. The focus needs to be on the overall usage of the plants and not, like with rapeseed, just on the amount of oil ultimately used in the production of biodiesel. Some 7.4 million tonnes of protein feed is required for the nutrition of domestic animals. The majority of rapeseed biodiesel, some 2.3 million tonnes of protein feed (Graphic 1), primarily rapeseed meal, is manufactured from biofuel production alone, replacing the corresponding import amounts of soya meal or a required cultivation area of over 1 million hectares. Conversely, this "credit note" of area not required for the production of the equivalent amount of soya is available for food production. Furthermore, these biofuel policies, in times of heavily increasing prices in particular, are leading to a range of resources that is available as an optional use of the food supply - UFOP stands by a "food first" policy.

With this in mind, the media also dealt extensively with the question of to how great an extent biofuels and their resources requirement ultimately contribute to world hunger and food crises. With the aim of providing proper information, UFOP and the Association of German Biofuels Industry (Verband der Deutschen Biokraftstoffindustrie [VDB]) had commissioned the Institute for Agricultural Politics and Market Research at the Justus-Liebig University of Gießen to execute a study entitled "The determinants for the level and volatility of agricultural resources prices on international markets taking particular note of biofuels and their resource requirements". In this preliminary study, Prof. Dr. Michael Schmitz illustrated the fundamental relationships. The simple formula often cited in public discussion and in the media "Hunger comes about due to high prices on the global agricultural markets" is simply wrong, says one of the study's findings. Most importantly, it explains the reasons why the resources requirements for biofuel production have such a limited effect, if any at all, on the global market prices of agricultural resources. In this discussion, it is often overlooked that in developing nations especially, lots of agricultural products are being produced for local markets and as such are decoupled from the global agricultural markets. Furthermore, these are raw food materials which are not traded on the global market (e.g. cassava, sorghum, manioc, etc.). For this reason, price fluctuations on the global markets for corn do not affect the local level in developing nations. Something more problematic is the fact that hunger in many countries is not a product of lacking availability (e.g. Brazil), but of low purchasing power, incompetent political leadership, weather events, and indeed also climate change.

The scientific discussion on the reasons for hunger and the development of prices on the global agricultural market has nonetheless accelerated considerably. The stock exchanges' price hedging instruments which are equally important to both agriculture and farming are being called into question increasingly by the public eye. In reference to the increasing liberalisation without state intervention, UFOP has observed how great the need is for information on the history of development and the importance of price security instruments today, in particular in farming and the subsequent stages of trade and processing. The influence of financially strong funds is overestimated. These will not trigger a price development, but will at most influence the price trend. In the opinion of UFOP, the crude oil price is a much more important price driver than the international agricultural markets. The price of crude oil has taken on the "base price" function for the development of costs and prices of agricultural resources. The simple view, repeatedly offered by the media, that when prices for fossil fuels increase so too do the prices for biofuels and consequently the prices of agricultural resources production, is not accurate. Penal regulation as an instrument of biofuel quota policy in the EU member states would trigger a price-damping effect should the prices of biofuel exceed that of the fine. Consequently, it makes more economic sense for the body obliged to satisfy quotas to pay the respective fine than use biofuels. These and additional relations will be examined in an

Table 1: Domestic consumption – Biofuels 2011

In 1,000 t	Jan.	Feb.	March	Apr.	May	June
Biodiesel Admixture	157.32	149.26	172.71	186.917	205.23	176.67
Biodiesel B100	3.59	4.97	2.22	3.364	4.69	7.32
Sum	**160.91**	**154.23**	**174.93**	**190.281**	**209.91**	**183.99**
Vegetable oil (V-oil)	0.51	1.21	1.06	3.235	2.41	0.97
Biodiesel & V-oil sum	**161.42**	**155.44**	**175.99**	**193.516**	**212.32**	**184.96**
Diesel	2,311.20	2,443.43	2,823.92	2,651.636	2,917.40	2,590.88
Admixture share	6.81	6.11	6.12	7.049	7.04	6.82
Sum - Fuels	2,315.29	2,449.61	2,827.20	2,658.235	2,924.50	2,599.16
Biodiesel & V-oil share	6.97	6.35	6.22	7.280	7.26	7.12

Source: Federal Office of Economics and Export Control, AMI

extensive study to be undertaken by the University of Giessen, the results of which shall be available at the start of 2013.

Turnover development of biodiesel 2011/2012

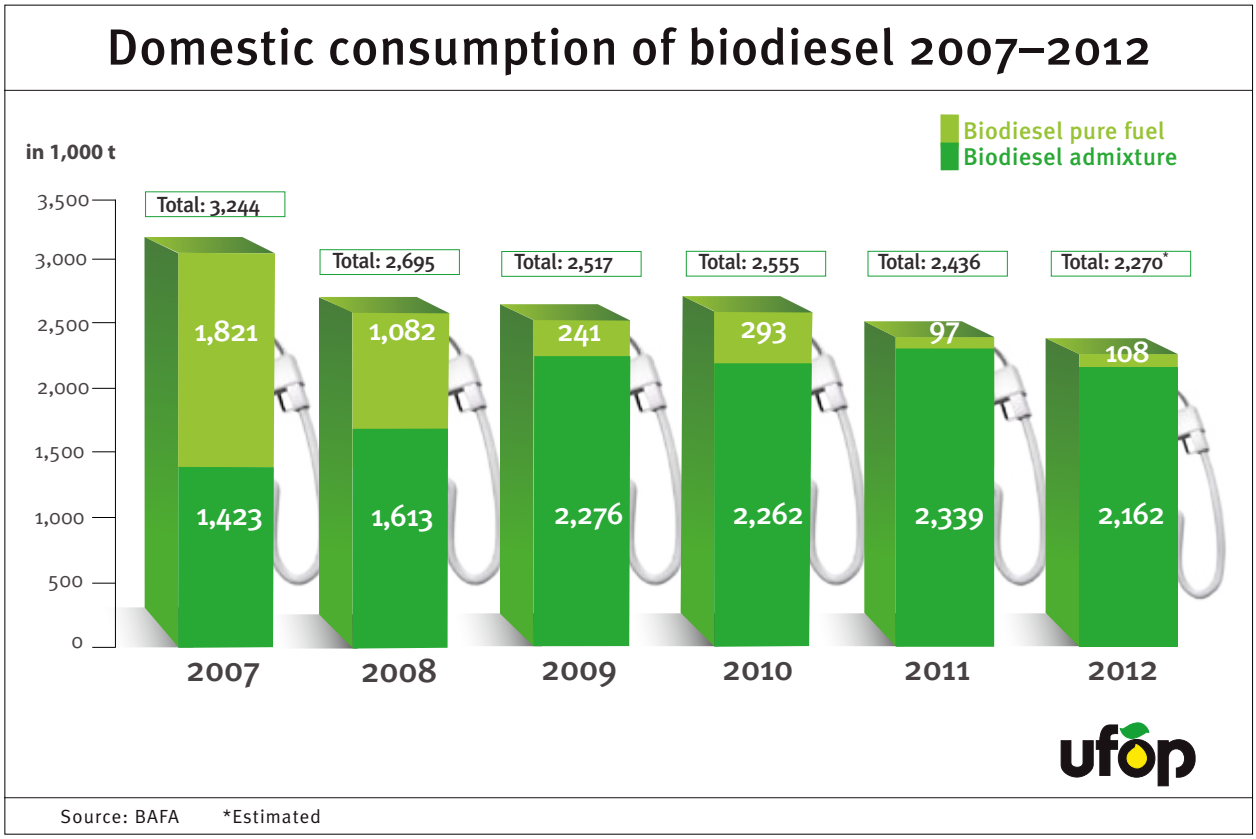
Overall biodiesel turnover in Germany in 2011 had a negative development from 2.529 million tonnes in 2010 to 2.426 million tonnes in 2011. The reason for this development is primarily the decrease in biodiesel marketing as a pure fuel (B100) from some 300,000 tonnes in 2010 to just short of 100,000 tonnes in 2011. Similarly, the quantity of sales for vegetable oil fuels decreased from around 61,000 tonnes in 2010 to almost 20,000 tonnes in 2011. As a result, the share of this biofuel in overall diesel fuel turnover decreased from 8 to 7.5 %. As a consequence of the good economic situation and the associated increased turnover of diesel fuel by 0.4 million tonnes, that is, from 32.13 million tonnes in 2010 to 32.53 million tonnes in 2011, overall biodiesel turnover stabilised. The increased demand for diesel fuel thereby compensated for the fall in B100. This development is problematic for vegetable oil fuel as it cannot be blended with conventional diesel fuel for quality reasons and instead must be marketed solely as a pure fuel (Table 2).

An estimate of biodiesel turnover for 2012 is tainted by a number of uncertainties. According to the market reporting of the Federal Office of Economics and Export Control (BAFA), some 1,261 million tonnes of biodiesel were marketed in the first seven months. For the period of the previous year, this figure was 1,272 million tonnes. Pure fuel turnover increased over this period from 31,000 tonnes in 2011 to some 63,000 tonnes at the end of July 2012. In total, some 20,300 more tonnes of biodiesel was sold in 2012 compared to 2011. Graphic 2 shows the respective estimates if this turnover trend were to continue in a linear fashion for 2012. In accordance with this, the quantity of biodiesel for the admixture would be some 2,162 million tonnes and thus approx. 156,000 tonnes less. Pure fuel turnover on the other hand, would increase by around 11,000 tonnes to 108,000 tonnes. Taking the maximum permitted admixture share of 7 % of volume, as stipulated by the European standard for diesel fuel, EN 590, the turnover potential in the admixture market is exhausted. Domestic growth could only be made possible by changing the standard requirements by introducing B10. Turnover could then increase to approx. 3.1 million tonnes. However, the automotive industry is opposed to this admixture formulation, pointing to expected engine-related problems, for example, motor oil dilution and insufficient compatibility with the exhaust aftertreatment systems of EURO VI vehicles. With this in mind, UFOP supports projects aimed at improving boiling behaviour, thus helping to avoid deposit formation in injection systems (see UFOP annual report 2011/2012, Chapter 5.5).

UFOP is apprehensive that the potential represented in Graphic 2 will not be exhausted in future and that biodiesel demand will fall dramatically as a result. At the time of going to press, the biodiesel quantity for quota year 2011 to be transferred to quota year (that is, calendar year) 2012 was not yet known. For this estimate, it needs to be noted that the Federal Government had passed the legal regulation to change the 36th Federal Emission Control Act (BImSchV) in relation to the double counting of biofuels against the quota obligation produced from waste materials to apply retroactively from 1 January 2011. According to information from the Federal Office for Agriculture and Food (BLE), sustainability certificates for over 400,000 tonnes of biofuels which could be double counted, primarily biodiesel produced from used vegetable oil, were registered in the Nabisy database. In the view of UFOP, the Federal Government had also extended, without any compelling reason, the setting of a deadline for proving quota fulfilment for 2011 by two months to 15 June 2012. Furthermore, BAFA's biofuels statistics do not indicate the degree of the market share of hydrotreated vegetable oil (HVO). Within the framework of expert discussions with the respective ministries, BMF, BMWI, BMELV and specialist authorities, UFOP & VDB had demanded the systematic recording and publication of HVO as well as of biofuel quantities which could be double counted.

						cumulated	
July	Aug.	Sep.	Oct.	Nov.	Dec.	curr. calcul.	Prev. year
224.75	215.32	190.39	214.12	218.99	216.99	2,328.66	2,236.024
4.77	5.05	10.34	9.42	8.28	32.91	96.91	293.061
229.54	**220.37**	**200.72**	**223.54**	**227.28**	**249.90**	**2,425.57**	**2,529.085**
0.43	0.57	2.53	2.27	2.18	2.26	19.63	60.921
229.98	**220.94**	**203.25**	**225.81**	**229.45**	**252.15**	**2,445.20**	**2,590.006**
2,766.60	3,037.27	2,944.68	2,822.09	2,902.81	2,621.29	32,833.19	32,127.963
8.12	7.09	6.47	7.59	7.54	8.28	7.09	6.960
2,771.83	3,042.89	2,957.54	2,833.79	2,913.27	2,656.45	32,949.73	32,481.945
8.30	7.26	6.87	7.97	7.88	9.49	7.42	7.974

Graph 2: Domestic consumption of biodiesel



Source: BAFA *Estimated

Biodiesel production and marketing in the EU-27

The turnover potential of biodiesel in the European Union is fundamentally determined by national legally stipulated biofuels quota obligations. In accordance with the European standard (EN 590) for diesel fuel, a maximum of 7 % of volume of biodiesel (EN 14214) can be blended with conventional diesel fuel. It can be seen in Table 3 that only the member states Austria, France, Germany, Greece and Spain are oriented towards the maximum target of the quota obligation. UFOP is critical of the fact that the European biodiesel industry, on the one hand, complains of high competition and import dumping, while on the other hand does not apply any pressure to exhaust the potential as specified by the diesel standard. In 2011, some 210 million tonnes of diesel fuel were sold in the EU. This corresponds to a potential use of biodiesel to the amount of some 13.6 million tonnes. This is compared to the actual demand of approx. 10.5 million tonnes. European production, according to the European Biodiesel Board (EBB), is estimated to have a share of 8.8 million tonnes. This corresponds to a fall of 8 % compared to 2010. As such, utilisation of European biodiesel capacities (22.12 million tonnes) fell below 40 % in 2011. In this regard, however, it is to be noted that the statistics relating to biodiesel production capacities do take those plants into account which have since been definitively removed from production. EU-wide, the trend is thereby consolidated that the biodiesel manufacturers are either relying on price-dependent resources imports, like in Spain and Great Britain, or biodiesel production was integrated as an additional pillar into the value-creation chain of oil seed trade and processing (rapeseed soya). These include, in particular, internationally active agricultural corporations like ADM, Cargill, Bunge, Louis-Dreyfuss.

Over the next few years, UFOP expects further decreases in biodiesel production, of rapeseed in particular, as the option of double counting biofuels (Table 3) will also be implemented in other member states. Quota fulfilment in Germany can be imputed without the acquisition of winter products (rapeseed methyl ester). Against this background, the question must be asked if the option of double-credits is in line with the energy and climate protection policy targets of the EU as, conversely, the corresponding "physical" fossil fuel quantity needs to be used to cover actual fuel requirements. Counting factors are used to make target fulfilment appear more beneficial than it actually is. Together with the option of double counting, the lack of statistical figures makes it impossible to calculate the extent to which the production and marketing of hydrotreated vegetable oils (HVO) by Finnish mineral oil corporation, Neste Oil, similarly determines the competition on the European biofuels markets too.

Overall, the European biofuels industry considers itself exposed to a constantly increasing pressure to import. While 2008 saw the USA with its B99 as the main biodiesel exporter to the European Union, from 2010 to 2012 Indonesia and Argentina assumed this import share. The anti-dumping action against the USA was thus wholly successful. At the instigation of the EBB, similar proceedings have been initiated by the commission

Table 2: Biofuel mandates in the European Union

	Total share	Biodiesel share	Bioethanol share
Austria	6.25 %	min. 6.3 %	min. 3.4 %
Belgium	4 % vol	4 % vol	4 % vol
Bulgaria	5.75 % vol	6 % vol	
Czech Republic		6 % vol	4.1 % vol
Cyprus	2.5 %		
Denmark	5.75 %		
Estonia	5.75 %		
Finland	6 %		
France	7 %	7 %	7 %
Germany	6.25 %	min. 4.4 %	min. 2.8 %
Greece	6.5 %		
Hungary	4.8 %	min. 4.8 % vol	min. 4.8 % vol
Ireland	4 % vol		
Italy	4.5 %		
Latvia	5,75 %	5 % vol	5 % vol
Lithuania	5.75 % vol		
Netherlands	5.25 %	min. 3.5 %	min. 3.5 %
Norway	5 % vol	5 % vol	5 % vol
Poland	6.65 %		
Portugal	5 %	6.75 % vol	
Romania	5.75 %	5 % vol	5 % vol
Slovakia	5.75 %	min. 5.2 % vol	min 3.2 % vol
Slovenia	6 %		
Spain	6.5 %	min. 7 %	min. 4.1 %
Sweden		5 % vol	6.5 % vol
Great Britain	4.5 % vol		

Source: Petrotec, 3-month report 2

Table 3: Double Counting

	Double Counting UCOME	Double Counting TME	
France	April 2010	April 2010	Double Counting decree ratified
Germany	2011	TME not accepted	Double Counting decree ratified
Great Britain	December 2011	December 2011	Double Counting decree ratified
Italy	January 2012 (not yet fully implemented)	January 2012 (not yet fully implemented)	Double Counting decree ratified
Austria	December 2010 (hardly used in practice due to other stipulations)	December 2010 (hardly used in practice due to other stipulations)	Double Counting decree ratified
Netherlands	December 2009	December 2009	Double Counting decree ratified
Spain	April 2012 (not yet implemented)	April 2012 (not yet implemented)	Decree still pending (ratified in April)
Ireland	2010	2010	Double Counting in accordance with EER
Denmark	UCOME not accepted	July 2011	Double Counting in accordance with EER
Finland	October 2011	October 2011	Double Counting in accordance with EER
Poland	not specified	not specified	Double Counting approval missing

Source: Petrotec, 3-month report 2

against Argentina and Indonesia. Argentina has since increased the export tariff on biodiesel by 20 %, to the level of domestically produced soya oil, but on the condition that the terms be subject to permanent review. The biodiesel industry is closely following the EU Commission's proceedings against Indonesia with much expectation.

Status of the implementation of sustainability certification systems in Germany

The meeting of the responsible expert consulting committee of the Federal Office for Agriculture and Food (BLE) took place on the occasion of the International Green Week in Berlin in 2012. The central focus of discussions was, among other items, questions on extending the mass balance period to up to 12 months for companies before the last interface. Corresponding applications of the certification systems REDcert and ISCC were rejected on grounds that this extension does not comply with the mass balance period of a maximum of three months as specified by the EU directive. The one-off approval of a 12-month period was justified by the Commission by referring to the systems' introduction for the first time.

With the approval of double counting of biofuels to the quota obligation, the biofuels sector fears that it would result in "acts of circumvention offences" due to the resultant incentivising effect. For this reason, both BLE and REDcert were fundamentally in agreement that certification must occur as early as the level of the point of collection of waste materials.

The BLE has since expanded the Nabisy database to the effect that sustainability certificates from any approved certification system can be entered. The Nabisy system functions practically as a platform for the positioning of sustainability systems of internationally active fuel producers and marketers. For this reason, the certificates and biofuel quantities entered into the system are not to be equated with forecasted turnover in Germany.

From the view of the stockholders, the further development of REDcert GmbH is extremely pleasing. In mid-2012, the EU Commission had approved "REDcert EU", the certification system submitted by REDcert. This lay the foundations for increased expansion of activities in other EU member states and non-EU countries. Similarly pleasing are the developments with system subscribers (Table 4).

A topic of intense discussion with the BLE was the question of marketing sustainable biomass from internationally recognised certification systems. The problem here is the BLE's stipulation that EU-certified companies may not trade or process sustainable goods from national systems. In this relation, the BLE determined that a solely EU-certified biodiesel manufacturer or supplier after the last interface may not process or trade sustainable German goods. REDcert thus recommended switching to the REDcert EU system as quickly as possible and to swiftly put the goods certified with "DE" on the market.

The fundamental problem remains that the Renewable Energies Directive has not been fully implemented in all member states to this date. According to the EU Commission, infringement proceedings have been brought against seven member states. Virtually only Germany and Austria implemented the directive on time, with Spain, England, the Benelux countries and Romania implementing it behind schedule and France, the Czech Republic, Poland and Denmark in the process of doing so currently.

The EU Commission has since approved 12 certification systems (Table 5), with 25 applications awaiting approval from the Commission. Within the framework of the meetings of the international working group of the responsible positions of the member states (renewable fuels regulators group – REFUREC: www.refurec.org/) the BLE is making efforts to include its experiences made during national implementation. In the view of UFOP, it would be desirable that an EU-coordinated documentation system in conformity with the requirements of the Nabisy system were to be put in place in the member states. Unfortunately, this does not appear to be the way things are developing and as such it is to be expected that distortions of competition as a result of this are to be expected, not least because of the different orientations of the approved EU systems. UFOP has determined that the human resources available to the respective offices of the EU Commission will not be able to cope with the required coordination and management duties required of them by the member states and the affected biofuel sector. Definite and pertinent questions on the implementation of the requirements specified by the Renewable Energies Directive will either be not answered or not answered in a legally binding way. The biofuels sector overall finds fault with the human resources available. UFOP sees it as imperative that an advisory committee, similar to the "Agriculture" executive board, comprised of representatives from the industry, be set up for the "Energy" executive board too.

Biofuels politics – how to develop further?

Over the course of the coalition negotiations when forming the grand coalition in Germany in 2005, the decision was made to gradually reduce tax concessions and instead promote the use of biofuels as admixture components in fossil fuels by way of a quota obligation. The gradual increase in tax on biodiesel meant that a globally unique sales and distribution concept had to be abandoned. In 2004, approx. 1900 service stations, thus around every ninth station in Germany, offered biodiesel. Biodiesel was on sale across the country through medium-sized mineral oil retailers. The most important customer by far was the carrying trade. The tax concessions were thus of domestic benefit to an economic sector which considers itself exposed to international cost pressure. UFOP is convinced that, with biodiesel as a pure fuel, gas tank tourism and the resultant tax deficit were similarly confronted. During the reporting period, UFOP repeatedly reminded the coalition of its announcement in the coalition contract that it would resurrect the pure fuels market. In the face of the financial crisis and the necessity to consolidate the budget, there is little enthusiasm among political parties to push for a legislative initiative which would simultaneously raise the question of possible tax shortfalls. The Energy Taxation Directive 2003/30/EC specifies that in the case of a turnover-enhancing tax concession being introduced, the affected member state is to execute an annual overcompensa-

Table 4: REDcert system subscribers

	Total	of that, EU system
REDcert system subscribers	**1,048 (+ 5)**	**44**
The registered companies are split into the following types of business:		
Primary distributors	839 (– 13)	19
Sugar refinery	11 (0)	5
Oil mill	124 (+ 2)	7
Biofuels manufacturers (including ethanol)	52 (+ 5)	9
Traders of solid + liquid biomass	38 (+ 8)	4
Biogas plants	11 (– 3)	
Other	7 (+ 2)	

Source: REDcert, October 2012

Table 5: EU-approved certification systems

	Date of approval	System
2011		**1. ISCC** (International Sustainability and Carbon Certification)
		2. Bonsucro EU
		3. RTRS EU RED (Round Table on Responsible Soy EU RED)
		4. RSB EU RED (Round Table of Sustainable Biofuels EU RED)
		5. 2BSvs (Biomass Biofuels voluntary scheme)
		6. RBSA (Abengoa RED Bioenergy Sustainability Assurance)
		7. Greenergy (Greenergy Brazilian Bioethanol verification programme)
		8. Ensus (voluntary scheme under RED for Ensus bioethanol production)
2012	02.04.2012	**9. Scottish Quality Farm Assured** (Combinable Crops Limited)
	12.04.2012	**10. Red Tractor Scheme**
	24.07.2012	**11. REDcert**
	31.07.2012	**12. NTA 8080** (Netherlands Technical Agreement)
	...	13. ...further 25 applications are apparently on the Commission's desk...

Source: European Commission

tion inspection and is consequently permitted to intervene with corrective action. In UFOP's opinion, however, this must also provide for a correction in favour of the use of pure biofuels.

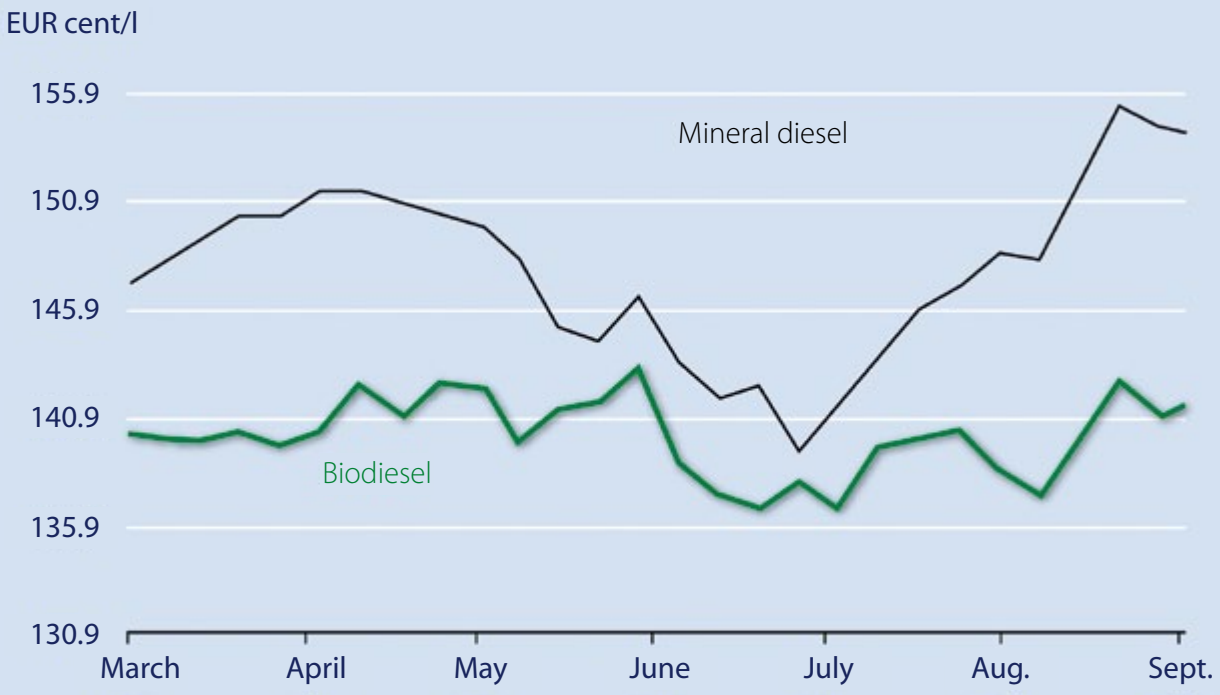
Reviving the pure fuels market without tax deficit

With its regulation on the contractual transfer of quota obligations in accordance with Section 37a of the Federal Emission Control Law (BImSchG), legislation has laid the foundations in relation to funding policy for the development of this regulation into a strategic promotional instrument for pure fuels. It is the foundation of so-called quota trading. Through the subsequent taxation of the sold tax-deductible pure fuel quantities (B100/rapeseed fuel), any tax deficit is reduced and, in the best case scenario, it is offset. This regulation on fulfilling the quota obligation was claimed by the affected economic circles to such a great extent that, in UFOP's opinion, the large majority of the pure fuel quantity was subsequently taxed since this regulation came into effect - thus, a tax deficit only arose temporarily. In retrospect, an overcompensation inspection would not have been necessary. The marketing of pure fuels is usually triggered when the use of vegetable oil or biodiesel as a pure fuel becomes attractive for a period, especially when diesel fuel prices are highly volatile (Graphic 3).

Biodiesel and vegetable oil fuel can then indeed have a calming effect on the development of diesel fuel prices. Due to the reduced tax rates on biodiesel (18.6 ct/l) and vegetable oil fuel (18.4 ct/l) (though expiring at the end of 2012), the foundation of quota trading would, however, be taken from under it as the purchasing incentive for fleet operators in the carrying trade is no longer present. This would be all the greater and would accelerate quota trading if it was possible to offer biodiesel and vegetable oil fuel tax-free. In the opinion of UFOP, this would be the quickest possible way to trigger quota trading and thereby biofuels marketing, albeit based on a quantity which corresponds to the expected quota gap. This is possible due to the fact that the market share of E10 at approx. 13 % is low as yet. However, an important qualification here is that the associated compensatory effect due to the option of double counting biofuels cannot be estimated as these quantities are not recorded in taxation statistics. As such, UFOP is of the opinion that increasing the overall quota from its current 6.25 % to at least 7 % (energy) needs to be reviewed.

Today, many years of experience have been gathered in relation to implementing quota trading between those parties obliged to fulfil quotas (mineral oil industry) and the retailers and producers

Graph 3: Consumer prices at the pump incl. taxes



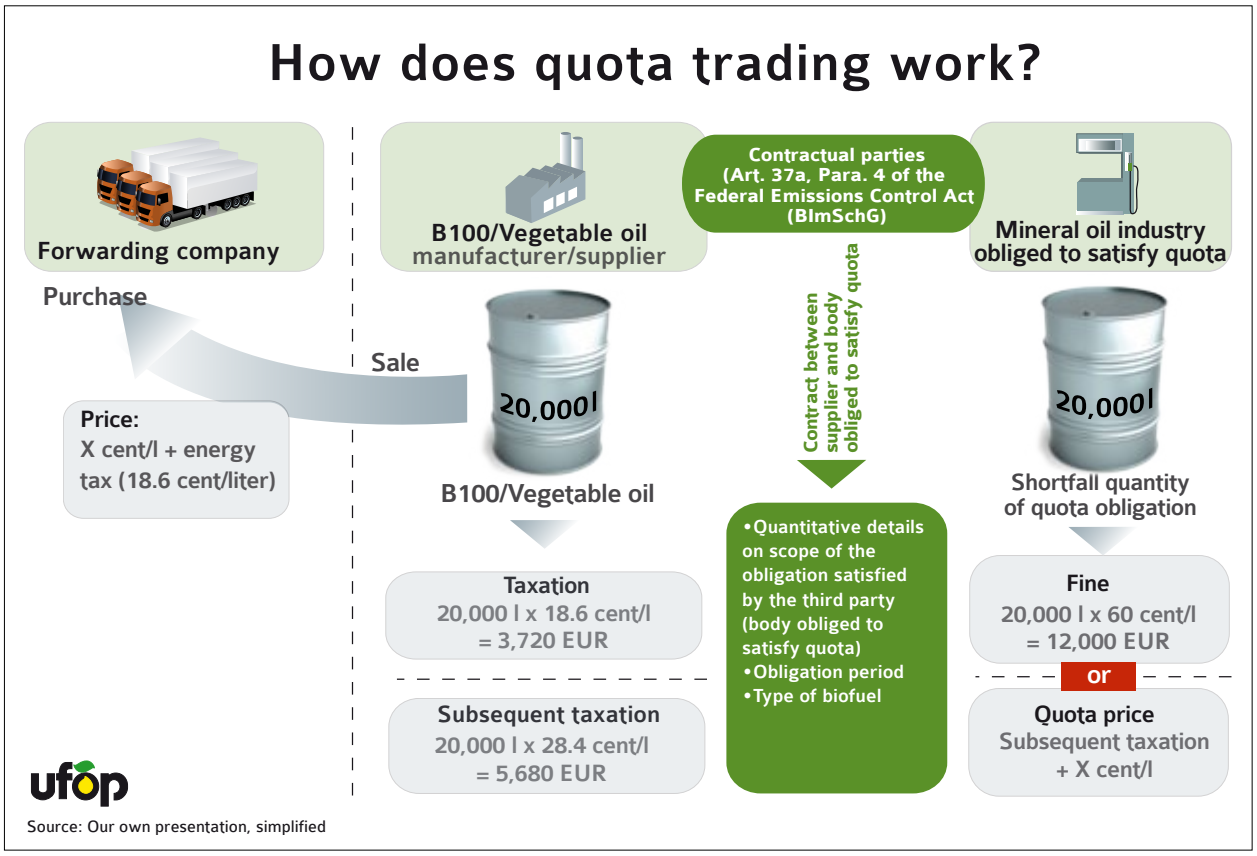
Source: AMI ©AMI 2012

of biodiesel under the required supervision of customs administration. The biofuels quota office records the quota amounts of those parties obliged to fulfil them (mineral oil industry and retail) and thus the parties' additional purchasing requirements in the case of a shortfall. The company-specific amount of biofuel of the party obliged to fulfil the quota can be calculated simply from the quantity of fossil fuel sold over the course of the calendar year. If, during the calendar year, insufficient biofuels were blended with the fossil fuels to fulfil the overall quota to the amount of 6.25 %, the obligated party, in accordance with the implementation order of the biofuels quota law, will have until 15 April of the following calendar year to secure the necessary "additional quota acquisition" by ways of a contract provision. A biodiesel/vegetable oil producer or retailer can subsequently tax the marketed amounts of biofuels which had tax concessions. On conclusion of the contract, the party obliged to fulfil the quota can then offset this (energetic) amount against their own quota obligation (Graphic 4).

How does quota trading work?

- The forwarding company buys biodiesel as pure fuel at a tax rate of 18.6 ct/l.
- Tax on the corresponding pure fuel quantity is paid at this rate by the retailer at the main customs office and is therewith fiscally recorded.
- Over the course of a calendar year (= quota year), a large mineral oil company sells diesel and petrol. The blended quantity of biodiesel or bioethanol and ETBE (the bio-share is taken into account at 47 %) are, according to the corresponding energy content, credited against the quota obligation to the amount of 6.25 % of the total quota.
- Taking into account all bio-shares in the respective fossil fuels, the quantity (energy share) is insufficient to fulfil the overall quota.
- The biofuel shortfall of the party obliged to fulfil the quota is determined by the biofuels quota office. If, by 15 April of the next calendar year, the party obliged to fulfil the quota has not rectified this shortfall, a fine to the amount of 60 ct/l will be payable. The incentive to avoid this fine is given by the fact that the tax rate on diesel at 47 ct/l is less.
- The biodiesel trader takes on, either entirely or in part, the not yet satisfied quota obligation of the body obliged to satisfy the quota by guaranteeing it based on the corresponding biodiesel quantity by ways of a contract and subsequently allowing the taxation of the corresponding biodiesel fuel quantity at the main customs office. This biodiesel quantity is then credited to the body obliged to satisfy the quota for its obligation to the biofuels quota office.

Graph 4: Quota trading



Source: Our own presentation, simplified

Why does a "quota gap" remain?

The amount of the admixture share is limited by the specifications of fuel standards: maximum 7 % of volume with diesel and 5 or 10 % of volume with petrol. Due to the low E10 share on the petrol market and the reduced energy content (30 % less than petrol), the bioethanol put into circulation is insufficient to fulfil the overall energy quota of 6.25 %.

The "driving force" of this quota trading is the payable fine to the amount of 60 ct/l. Politics, as has been confirmed, correctly set the fine at this level. Over the last few years, this legal stipulation has shown that the quota obligation can be fulfilled and the environment and resources-based targets of the EU for 2020 can basically be achieved. This funding policy instrument needs to be further developed in order to achieve the target specified by the EU. Politics have put in place the framework conditions described above in order to secure fulfilment of the targets and quota obligations, but as yet without any intention to develop these further into a targeted funding instrument for biodiesel or vegetable oil as pure fuels.

UFOP's recommendations:

1. Continuation of tax concessions for biodiesel and vegetable oil fuel in accordance with Section 50 of EnStG - the amendment to the energy taxation directive also seeks to empower the member states again to support tax concessions on biofuels for a period of ten years.
2. Creation of an energy-tax-free volume quota to the amount of 400,000 tonnes as a basic amount to close the "quota gap", necessitated by low E10 sales.
3. Increase in the overall quota to 7 % (of energy) - the procedure of quota trading enables a quota increase without a tax deficit.

Limiting the tax-exempt amount to 400,000 tonnes would have the advantage that the risk of a tax shortfall is justifiable and this quota can be inspected easily via customs administration.

The advantages:

1. The shipping trade would benefit from an inexpensive fuel alternative as a potential consumer of biodiesel; in doing so, an effort would be made to remain internationally competitive.
2. Biodiesel would be able to regain footing in the trade industry.
3. Looking to the loss-making supply issue in the diesel fuel area, the pure fuel quantities used in addition would alleviate the supply situation.
4. The required development pressure on the automotive industry would be given for the approval of the corresponding vehicles for use of biodiesel (B100) or even for use of B30 (30 % biodiesel share in diesel fuel).
5. Necessitated by quota trading, the tax concession would ultimately be compensated for with a corresponding time delay, thus making overcompensation inspection unnecessary.
6. The use of vegetable oil fuel in the transport sector would also become more attractive.

7. It is to be assumed that the marketing of pure fuel will concentrate primarily on the transport trade, not least for distribution reasons. These companies usually have many years of experience in using biodiesel and even vegetable oil fuel. For this reason, an "E10 debate" in regard to the required approvals, like those for the car sector, is not to be expected. Additionally, it should be pointed out that fuel use is a "voluntary decision" of the respective transport company.

With the option of quota trading, Germany would set a signal on a European level for an alternative way of promoting biodiesel or vegetable oil as a pure fuel. Other member states may also see this promotion option as another way to accelerate the marketing of biodiesel in relation to achieving targets in accordance with the Renewable Energy Directive.

36th Federal Emission Control Act (BImSchV) – Double-crediting waste materials

In accordance with Article 21 (2) of the 2009/28/EC Directive, the member states shall nationally implement the regulation of the use of waste materials and must ensure that the biofuels produced from this, compared to other biofuels, are double counted to the quota obligation. Germany has implemented the "double counting" system to apply retroactively from 1 January 2011. The anticipated concerns already raised by UFOP are confirmed in current economic events and in the fact that insufficient specifications were coordinated by the EU Commission with the member states, for example, in relation to the definition of waste, as a precondition for the approval of corresponding resources for double counting. This results in considerable distortions on the domestic market and in the international resources trading of "used waste fats and oils". The implementation of this specification has only happened in some member states (Table 3). In its statement on the draft of the regulation, UFOP determined that double counting, as measured by the resources costs of vegetable oils and fats and the costs of processing them into biodiesel, brings about a value creation evidently underestimated by the Commission. This leverage effect, which is amplified by the associated reduction in the danger of the body obliged to fulfil the quota having to pay a fine, makes the use of waste materials extremely attractive and has thus brought about considerable market distortions within a very short space of time. This effect can be seen in the price quotations for biodiesel manufactured from used vegetable oils (UCOME) and animal fats. Nevertheless, it must be pointed out that only animal fat of Category III (fit for human consumption) in accordance with the biomass regulation was approved in Germany up until 31 December 2011.

Table 6: Price quotations 8 August 2012

RME	1,126 – 1,146 EUR/m³
TME	1,221 – 1,271 EUR/m³
UCOME	1,336 – 1,385 EUR/m³

RME = Rapeseed Methyl Ester
TME = Animal Fat Methyl Ester
UCOME = Used Cooking Oil Methyl Ester
Source: Kingsman

Market watchers observed brisk trading with UCOME as a result of this, but also with the corresponding resources. The biodiesel industry in the European Union also receives an increasing number of offers from non-EU states whose pedigree and suitability in terms of requirements of waste legislation and for further processing into standards-compliant biodiesel need to be scrutinised. UFOP, for example, also received offers from China from "producers" of used fats and oils. To prove the origin of the resource and the biodiesel produced from it, it would be desirable to be provided with a certificate of analysis. For this reason, UFOP welcomes the initiative of the Quality Management Biodiesel e.V (Arbeitsgemeinschaft Qualitätsmanagement e. V.) (AGQM) for identifying analytical quality parameters to certify the waste's properties. However, this project requires that the term "waste" in international trading, in the sense of an agreed definition in relation to its origin (waste generation) and properties, is enshrined in law and documented accordingly (traceability). For this reason, UFOP demands that the waste registries, in a similar manner to the primary distributors in agricultural trade, also need to be certified. UFOP sees the market for rapeseed oil in the production of rapeseed oil methyl ester and consequently rapeseed cultivation in Germany as under threat due to the high level of economic incentivisation, particularly since the turnover from UCOME will concentrate on the member states with the most attractive economic framework conditions. The EU Commission, with its regulation on double counting, is simultaneously cementing the disadvantage of biodiesel plants which cannot process waste fats and oils for procedural reasons. In this regard, UFOP's concerns have already been confirmed in France. 350,000 tonnes of biodiesel, produced from waste fats replaced a potential turnover of 700,000 tonnes of rapeseed oil methyl ester. As a result, the French government reduced the maximum permitted biodiesel quantity eligible for double counting from 350,000 tonnes to 125,000 tonnes for 2012. With this in mind, UFOP welcomed the intensification of inspection and certification requirements specified in the draft for amending the 36th BImSchV. The draft is a step in the right direction. It does not, however, solve the problem that different resources for double counting are permitted in different member states, thus making imports due to insufficient inspection possibilities virtually unavoidable. In the light of the time constraints for national implementation and coordination necessity on an EU level, UFOP demanded a regulation like the one in place in France to restrict double counting UCOME from old fats and waste materials to a max. 150,000 tonnes (corresponds to 300,000 tonnes RME). Simultaneously, an initially time-restricted limit on biofuel quantities would considerably reduce the incentive effect of double counting, giving those biodiesel manufacturers who show long-term interest in the proper implementation of documentation regulations the chance to establish themselves. For this reason, a volume-based limit should be introduced in all member states. Should serious problems arise, for example, if the introduction and inspection of the required intensified documentation certification on the domestic market or in non-EU states should fail, UFOP is of the opinion that the Federal Government should be proactive and demand the Commission to abolish this regulation. For the waste materials in question, it fundamentally needs

to be noted that these will be removed from existing utilisation, thus triggering substitution or demand effects in other economic areas. In accordance with the systematics of the iLUC idea, these resources would not be "iLUC-free".

Fuels strategy of the Federal Government

Within the framework of extensive dialogue with the affected expert groups from the world of economics (automotive industry, mineral oil industry, biofuels industry, mineral oil trade, NGOs and scientific institutes), the Federal Government has decided to take on the task of compiling key points for the future direction of a fuels strategy. These directives should form the basis for the future strategy for mobility and fuel in Germany. The target is to have the federal cabinet pass a resolution on an extensive strategy concept in the spring of 2013. In the spring of 2012 with the arrangement of corresponding workshops, the responsible Federal Ministry of Transport, Building and Urban Development (BMVBS) began to enter into the process of dialogue and coordination of planning. This dialogue process focussed on the topics of "fossil fuels", "biogenic fuels" and "new energy from fuels" (including electromobility, fuel cells/hydrogen, among others) as well as on the modes of transport "road", "rail", "water" and "air". As expected, the discussion was pursued by the experts from the mineral oil and vehicles industry and the biodiesel sector. While one side emphasised the claim that B7 is the technical limit, preferring the so-called "drop-in fuels", e.g. HVO, the biodiesel sector clarified that even greater admixture shares (B30) or B100 are possible with the currently valid legal emissions requirements (EURO V and VI). Here, it was possible to refer to the research results on the use of biodiesel inutility vehicle engines of the UFOP-sponsored projects (see UFOP Annual Report 2011/2012, Section 5.5).

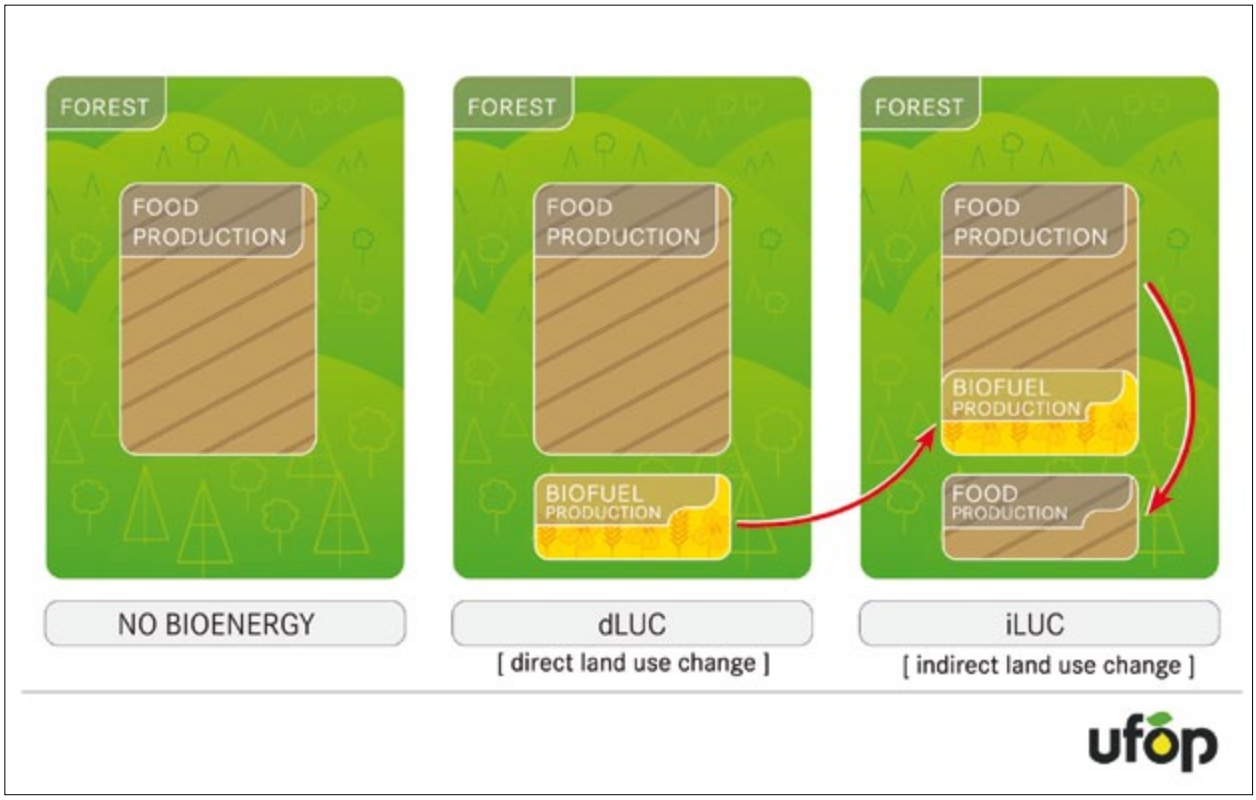
The BMVBS repeatedly drew attention to the fact that, in relation to the focus of the strategy, those sectors in particular which also expect future growth in fuel consumption must be taken into consideration. In UFOP's opinion, a discussion was had which should have been had straight after the results of the "Biofuels Roadmap" were published in 2007.

The collection of facts as well as the compiled assumptions serve as a basis for the processing of recommendations of actions for the meetings following in Autumn 2012.

As part of the MKS experts' dialogue, the biofuels industry were specifically called on to answer the question "Biofuels – What are the goal conflicts? How can they be resolved?" Biofuels are thus in a sphere that, among other things, includes the following goal conflicts and requirements: Availability, usability, costs, environmental impact and the certification of greenhouse gas reduction. However, together with the question of primary use of biofuels or, ultimately, of the biomass source (biogas, liquid biofuels...) it was also pointed out that biofuels produce a not insignificant loss elimination effect in relation to protein feed supply and simultaneously serve as a raw material source for materials use in the chemicals industry (e.g. glycerine from biodiesel production). As such, all of the usage applications of biomass as a raw materials source are to be taken into account with biofuels.

The mobility and fuels strategy of the Federal Government is also a topic of the 10th International Biofuel Congress of UFOP and the BBE in January 2013. The congress is under the patronage of the BMVBS.

Graph 5: Indirect land use change (iLUC)

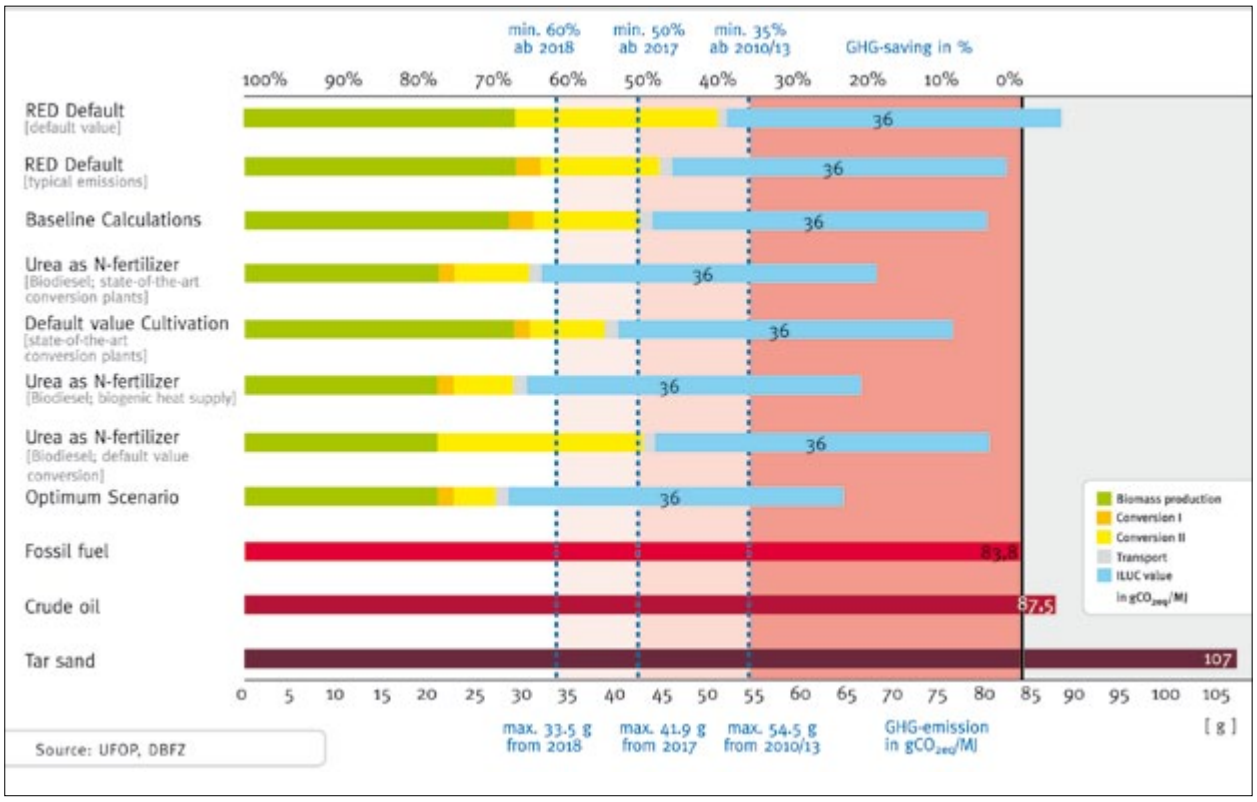


iLUC – What options is the Commission discussing?

UFOP expects to host intense discussions on future perspectives of biofuels in Autumn 2012. In this timeframe, the Commission will present its suggestions on changes to the Renewable Energy Directive (2009/28/EC) and the Fuel Quality Directive (2009/30/EC). The so-called trialogue procedure between Council, Parliament and Commission begins. In June 2009, with the passing of the Renewable Energy Directive, the European Parliament instructed the Commission to examine the question of the importance of so-called indirect land usage changes and to present a report and, if necessary, legislative recommendations for adjusting the directives. For this reason, the Commission instructed various institutes, among others, the Washington-based International Food Policy Research Institute (IFPRI), to calculate greenhouse gas emission values for diesel and petrol-replacing biofuels based on various biomass resources. This job was commissioned based on the idea that resource cultivation in Germany/the EU or in non-EU countries like Brazil, Argentina, Indonesia and Malaysia (as the most important resource producing countries) leads to changes inland usage in order to re-establish the market balance (Graphic 5). The requirements of biofuels/resources and area are derived from this based on the plans of action (see UFOP Annual Report 2010/2011, P. 27) which the member states communicated to the Commission. As measured by EU diesel consumption, the action plans state that an overall requirement of approx. 21 million tonnes of biodiesel will be necessary for the target year of 2020. Using this parameter, the Washington-based "IFPRI Institute" carried out its calculations, while the Joint Research Center (JRC), in turn, calculated the emission values for land usage changes for eight resource-specific biofuels. This institute calculated the iLUC factors based on the type of resource, vegetable oil or sugar and starch resources: a global iLUC factor which can be applied to all biomass resources as well as according to specific resource groups (vegetable oil or sugar/starch based resources). Graphics 6 and 7 show that, even with the low global impact of 36 g of CO_2/MJ, vegetable oil fuels will not be able to meet the greenhouse gas reduction target of at least 50% applicable from 2017, even if every option for greenhouse gas reduction was used in rapeseed cultivation, for example, the type of fertilizer used.

As expected, the announcement of these results triggered fierce criticism of the EU Commission from the agricultural sector and the biofuels industry. The EU Commission needs to recognise that, under these conditions, not only biodiesel production, but also the production of hydrotreated vegetable oils (HVO), which only began in the last few years, by the mineral oil corporation, Neste Oil, would be at an end. Investments of billions would be in danger, including those used for the setup of corresponding oil seed processing capacities. During the meeting of the council of commissioners on 2 May 2012, chaired by Commission President Barroso, three options were discussed, the target of which was to reach an agreement as a requirement for a legislative recommendation for changing the directives.

Graph 6: Greenhouse gas optimisation (DBFZ) for RME + iLUC (global)



What option provides the impetus?

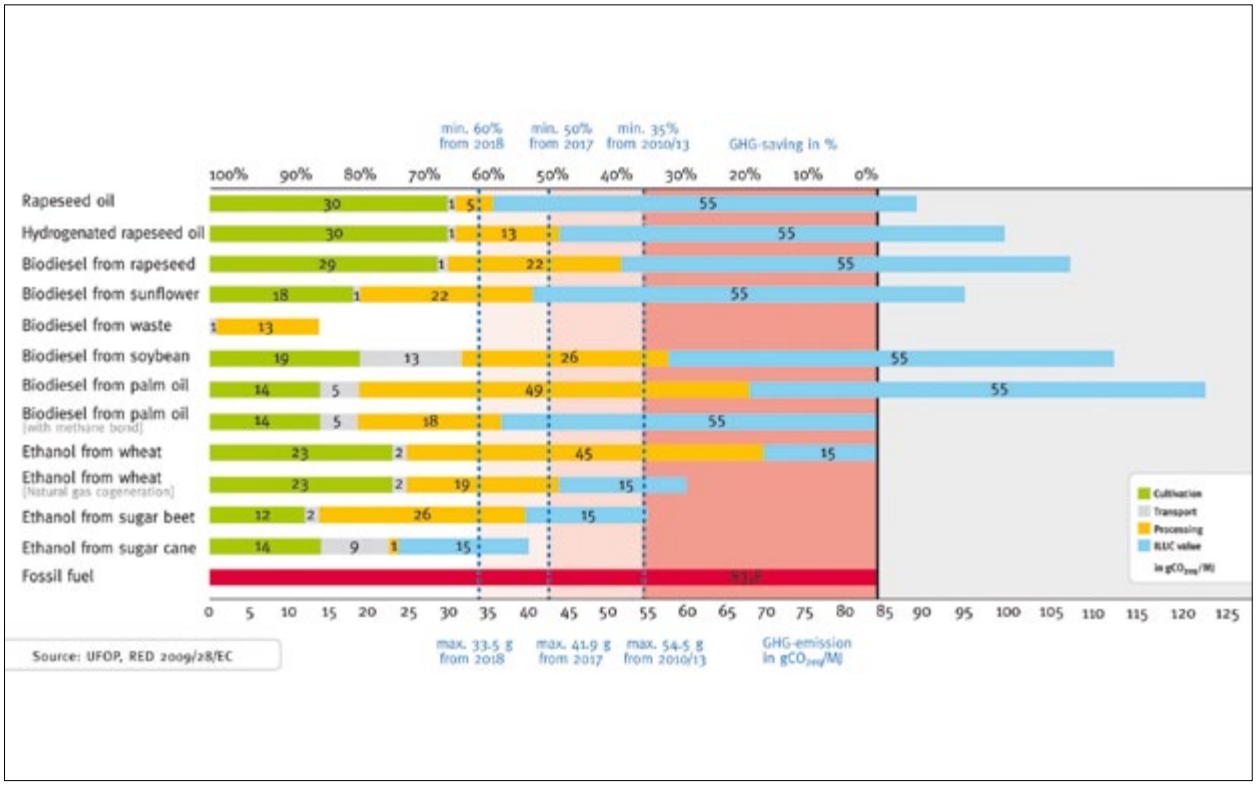
Option 1 involves iLUC factors not being introduced in 2017, instead increasing the minimum requirement of greenhouse gas reduction to at least 60% instead of the previous 50%. For old systems, an immediate increase in the minimum value for greenhouse gas reduction to 45% (previously 35%) shall be enforced with the passing of the amended directive. From the view of UFOP, it would be possible to fulfil this stipulation with rapeseed as the resource of production without difficulty.

With Option 2, resource-specific iLUC factors would be introduced from 2017, but differentiated according to resource groups. For oil plants (rapeseed, soya, palm tree) at 55 g CO_2/MJ (Graphic 7), the requirements would be even higher than the global iLUC factor. In contrast, bioethanol production from "sugar resources" (wheat, maize, sugar-beet, etc.) with an iLUC factor of 10 to 15 g CO_2/MJ would be the "winner" in this debate. Similarly, this option would immediately increase the greenhouse gas reduction rate to 45% for old systems. As Graphic 7 shows, the introduction of resource and fuel-specific iLUC factors would definitely signal the end for the production of biodiesel or HVO based on rapeseed or othervegetable oils. In any case, turnover prospects from the production of biodiesel from waste fats would still be present as an iLUC factor on waste is not envisaged. In combination with the double counting, this significantly increases the "desirability" of waste fats as a raw materials source. Acts of circumvention offences, which at this early stage are already happening due to double counting for the quota obligation, will need to be discussed in detail should iLUC factors be introduced.

UFOP is critical of the fact that, due to these iLUC factors, the 2020 targets would more or less need to be fulfilled exclusively through bioethanol, while, in contrast, diesel demand in the EU is constantly on the rise with petrol demand sinking. However, this scenario was not tested in the studies. It is obvious that, according to the iLUC idea, the iLUC value for bioethanol would then have to rise in order to factor in the increased resource and area requirements. The higher the iLUC value, the greater the need for biofuels would be – Result: iLUC generates iLUC. Policymakers would thus find themselves in a dilemma that cannot be resolved. Furthermore, achieving the targets would only be possible if the required approvals from the automotive industry for the then necessary amount of bioethanol admixture were granted. Does the world of politics really want to engage in an E20 or E25 debate?

Option 3 calls for the immediate increase of the greenhouse gas reduction requirement to 60%. The afore-mentioned iLUC factors would not be specified as minimum threshold values for market access, but are to be taken into account with the method of calculating the fulfilment of greenhouse gas reduction (which still needs to be agreed on between the EU Commission and the member states) to 6% in accordance with the Fuel Quality Directive. At the same time, a sub-quota for so-called "low iLUC biofuels" should be determined with the aim of providing an investment incentive for

Graph 7: Standard greenhouse gas emissions for biofuels + iLUC*



the market launch of the so-called second generation of biofuels produced from waste materials. This option, like Option 2, also leads to the practical exclusion of vegetable-based biofuels, while the immediate increase in the greenhouse gas reduction requirement to 60 % already demands a greenhouse gas optimisation strategy for all stages (rapeseed cultivation, oil seed processing and biodiesel production).

In the view of UFOP, only Option 1 would be productive in relation to maintaining or further developing oil seed cultivation in the European Union. In the studies, the protein feed production resulting from biofuels production is not properly taken into account when making the greenhouse gas calculation. Biofuels from domestic resources would have to deal with this minus point when it comes to greenhouse gas competition.

What's next?

At the time of going to print, the EU Commission was not able to reach an agreement on how and if iLUC factors will determine the future of biofuels policy in the European Union. During the reporting period, European expert groups, including UFOP, initiated numerous activities, among other things, to cast doubt on the scientific validity of the IFPRI study. The Institute itself points out that the results of the study have 25 uncertain items. A significant cause-and-effect relationship between the expansion of rapeseed cultivation in Germany and the resultant rainforest clearing, in Indonesia for example, cannot be proven with this study. With regard to the required market balance, it is to be stated that a global effect due to the additional demand for biomass resources in biomass production is not to be excluded. In light of the global resource production quantities and the thus comparably smaller space requirements for resources for biofuels production, a statistically demonstrable iLUC effect is not possible. In light of the consequences for both European oil seed cultivation and the biodiesel industry UFOP rejects the justification presented by the Commission of having to create a regulation as a precautionary principle. UFOP also expressed these views during a meeting with the cabinet of Energy Commissioner Oettinger and demanded, as part of bilateral negotiations with the affected non-EU states in South America and Asia, that binding agreements for the protection of the biotopes be made instead of introducing iLUC factors.

The 2050 Energy Roadmap of the EU Commission – the long-term strategy

At the end of December 2011, the EU Commission had submitted its message to the European Parliament, the Council and European Economic and Social Committee in relation to the so-called 2050 Energy Roadmap. The draft brought about some very critical statements of rejection from political, economic and environmental organisations. The renewable energy associations in particular criticised how, on the one hand, the potential of renewable energy was underestimated and as a result of questionable calculation models their costs were overestimated on the other.

What is it about? Core elements of the roadmap

In its 2050 Energy Roadmap, the EU Commission is presenting a comprehensive and sustainable strategy for the reduction of carbon in the European economy. In the roadmap for the transition to a competitive CO_2-weak economy by "2050", the Commission recalls the commitment of the EU Council made in October 2009 to reduce greenhouse gas emissions by 80 to 95 % below the level recorded in 1990. Herewith, the European Union wants to set an example internationally for the necessary reduction of greenhouse gas emissions by industrial nations. In its roadmap, the Commission has determined that the energy targets of 2020 are ambitious and that, if achieved, it will mean that some 40 % of the greenhouse gas reduction target for 2050 will already have been reached. Since the defined legal specifications for target achievement after 2020 for 2050 are not clear and the basis for necessary investment security for the new design and restructuring of the European energy supply (electricity, heating and fuel) needs to be created, subsequently adjusted measures and the resultant associated investments would bring about significant additional costs. The Commission has clarified that this roadmap can only provide the necessary framework. It cannot replace the energy-political measures adapted for the respective member states. In order to determine whether or not the greenhouse gas reduction of 80 to 95 % can be achieved, the EU Commission examined various scenarios which, alongside high energy efficiency and diversification of supply technology, also take into account a high share of renewable energy as well as the question of CCS technology and nuclear power.

The Commission concluded that ten structural changes to the EU's energy system setup are required:

1. Eliminating carbon is possible and may be more cost-effective in the long run than current political ideas.
2. Larger investments and lower fuel costs.
3. Electricity to play an increasingly important role.
4. Energy prices will rise until 2030 and fall after.
5. Expenses of private households will rise.
6. Energy savings across the entire system are essential.
7. The share of renewable energy will increase significantly.
8. CO_2-separation and storage must play a central role in the system's restructuring.
9. Nuclear power will make an important contribution.
10. Networking and coordination between locally and centrally generated energy will increase.

The Commission points out that only by combining these energy production and supply scenarios will it be possible to achieve the target. Along the way, considerable investment into the structural reorientation of energy production and supply will be required. For network expansion alone, investment costs between 2011 and 2050 are estimated to be between 1.5 and 2.2 trillion EUR. With these investments the Commission is assuming in its scenarios that electricity will also play a major role in mobility (cars and light utility vehicles). While this would result in consumer energy prices increasing, they will be more than compensated for in the medium-term by greater increases in energy efficiency. Due to technical advances, the Commission predicts that prices will start to come down from 2030. Alongside the technology-dependent energy savings, the central focus of the strategy is also consumer behaviour when using power. In regard to the scenarios mentioned, environmental organisations have been particularly critical of the fact that nuclear energy will continue to make a significant contribution in the future (18 or 15 % of primary energy needs). While simultaneously, old coal-fired power plants are to be replaced by new, efficient power stations in combination with the introduction of CCS technology.

Here, UFOP observed that nuclear power in Germany after Fukushima is, by law, obsolete and that CO_2-separation is in the mean-time coming up against such resistance that the Brandenburg-based project of the energy provider Vattenfall, the only of its kind to date, has to be cancelled and the funding repaid to the EU Commission. The expansion of the grid, in respect to target achievement, is being accorded an almost "fateful" role. Without strategic network expansion, an increasingly diversified and locally constructed energy supply as detailed in the roadmap will not be possible. In this regard, the Commission also sees the need to push for greater convergence and to have both network operators and the energy producers share more of the system costs; but it does not go into any greater detail on this.

With the aim of adding incentives as quickly as possible and achieving scaling effects and greater market integration more quickly, the EU Commission is highlighting EU Directive 2009/28/EC as a necessary legal platform for the promotion of using energy from renewable resources.

How important is biomass?

In its roadmap, the Commission highlights biomass as an important source of energy for the areas of heat and electricity generation as well as for mobility. The Commission has determined that, in future, a mix of different alternative fuels will need to serve as substitutes for mineral oil-based fuels, but that these will need to satisfy the respective requirements of transport modes (similarly this refers to the compatibility of biofuels and motor and exhaust technology). The Commission assumes that biofuels will be an important future option in aviation as electricity will be available as an alternation for the road and rail-based carrying trade. Nonetheless, the Commission adds the caveat that biomass usage must be accepted on the market and that a restructuring to avoid utilisation competition in relation to biofuels production based on waste and other new biomass sources (e.g. algae) be in place. Furthermore, the EU Commission sees additional potential area in Russia and Ukraine.

However, the Commission's roadmap also determines that fossil fuels will be a component in the energy mix for the fuel supply of long-haul passenger and goods transport in 2050. Existing refinery capacities will also need to adjust and adapt to changing demands of the respective period. The switch to alternative fuels, including electric vehicles, is of particular importance. This switch needs to be promoted by governmental developments, which, however, are not detailed any further, and by standards and corresponding infrastructure policies. The Commission also sees the additional main options of alternative fuels in the form of biofuels in general as well as synthetic fuels, methane and liquid gas as important options. To create the required incentives, the Commission recommends that CO_2-emissions be priced in such a way that primarily efficient and thus CO_2-weak technology can become competitive. In relation to restructuring energy taxation, the Commission's draft directive is already targeting the CO_2-component of taxation with this goal in mind.

The Commission is fully aware of the social dimension of its energy roadmap. Not only does it affect the creation and reclassification of workplaces, it also affects the acceptance of certain types of technology (CCS). Furthermore, social support is required as it will not be possible to financially compensate the increasing energy costs for certain groups of society.

The switch to a new energy system is detailed in the EU Commission's roadmap pending ten conditions:

1. The implementation of the 2020 energy strategy has priority. This must include dialogue with social groups and partners.
2. The energy systems need to be designed in an overall more efficient way.

3. So-called achievement milestones (up to 2030) are to be set.
4. Research, demonstration and technological investments must be promoted and organised for the purpose of swifter marketing of the necessary technology.
5. The EU must implement the duty to have a completely integrated energy market by 2014. Regulation-related and structural shortfalls need to be dealt with now.
6. The energy prices need to properly reflect the costs. However, those groups in need of protection need to be taken into consideration accordingly.
7. A new consciousness in the sense of collective responsibility needs to be developed in order to create the new energy infrastructures required.
8. Compromises shall not be made in relation to the safety of conventional or new energy sources.
9. A coordinated EU approach must be the foundation, including the activities regarding internationally agreed climate protection measures.
10. Both member states and investors need defined milestones. For this reason, the definition of the political framework up to 2030 is the next step in the transition to a low CO_2-economy.

Public relations work

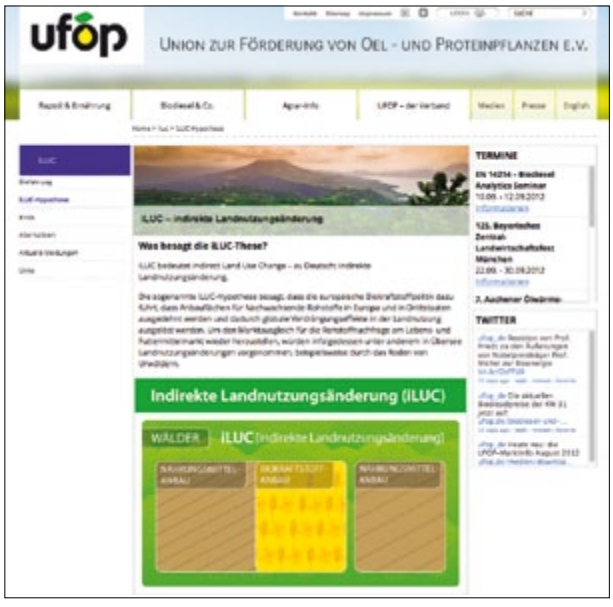
Press Conference UFOP, VDB

"Food vs. Fuel" – Focus (study, press conference and parliamentary event)

UFOP, together with the Association of German Biofuels Industry e.V. (Verband der Deutschen Biokraftstoffindustrie e. V. - VDB) took the opportunity of the discussion of the effects of biofuels production on hunger in the world to commission renowned Giessen-based agricultural economist, Prof. Dr. Michael Schmitz with the execution of a preliminary study on the determinants for the level and volatility of the prices of agricultural goods on international markets. The study presented on 23 February 2012, which also has implications for global nutrition and policy definition, was presented to members of the German Parliament and their employees as part of an information event as well as to journalists during a press conference at the "Haus der Bundespressekonferenz". Communication of the message stating that the simple formula that "hunger is due to high prices on global agricultural markets" is false, was successful as could be seen by the reactions of the politicians and by subsequent reporting in the press in particular.

Public relations work on the topic of iLUC

Over the reporting period, the topic of indirect land usage change (iLUC) has developed into a central focus of content. In this regard, one target of UFOP activities in the area of public relations work is to properly inform disseminators and political decision-makers on both a national and European level of the iLUC idea by using facts. In addition, the association also set up a special menu as well as hosted information events and political discussions in Brussels, along with extensive press relations work on the www.ufop.de website. This gives the users an overview of the current issues, discussions and decision options in relation to the iLUC idea. The information provided comprises explanations of the EU legal background as well as on the criticism of the introduction of so-called iLUC factors by



UFOP-Website

Exhibition stand Renewable Energy

experts and associations. A number of links provide access to additional technical papers and studies.

Federal party conventions

On 21 and 22 April 2012, UFOP participated for the first time at the "Joint Renewable Energies Stand" of the Agency for Renewable Energies (Agentur für Erneuerbare Energien (AEE)) as part of the FDP federal party convention. The overriding aim of the AEE's presence is to demonstrate the uses and advantages of renewable energies to the politicians of all parties. For UFOP, participation does not just mean the chance to specifically present its own positions on current, politically relevant topics like iLUC, the "Food vs. Fuel" discussion or on fiscal topics, it simultaneously provides the opportunity to have detailed discussions with politicians on the topics and answer questions. Over the course of 2012, further party conventions of the CSU, CDU and the Greens will be attended.

Rapeseed power on the track and in the Media

2012 marks the tenth year of close cooperation between UFOP and the biofuels racing project of the Reutlingen motor sport company, Four Motors, which is based around the artist and racing driver, Smudo, and former DTM driver, Thomas von Löwis of Menar. The combination of motor sport, automotive technology, environmental and sustainability issues and, last but not least, the participation of a very prominent driver make this project so important to the press and public relations work of UFOP. Since 2011, the project, which has been focussing on an innovative biofuel mix made from 100 % rapeseed oil, provides the opportunity to clearly communicate the topic of sustainability certification.

Specifically, the biofuel used is a mixture of conventional rapeseed biodiesel (RME) and hydrotreated rapeseed oil (HVO). With this "rapeseed power", the team lined up both at races

Bioconcept-Car

of the German endurance racing championship (Langstreckenmeisterschaft) and in front of over 200,000 spectators at the ADAC 24-hour race at the traditional "Nordschleife" track of the Nürburgring. As part of this major event, UFOP presented the resource and sustainability aspects of the project at an information event organised by the HVO producer, Neste Oil. At the invitation of UFOP, two members of the state parliament of the Rhineland-Palatinate joined Alexander Licht and Arnold Schmitt in visiting the major motor sport event. During the visit, however, the main focus was not on the race, but much more on the fuel technology as well as on the current situation on the German biofuels market. UFOP Managing Director, Stephan Arens, explained the background and the position of UFOP in relation to the topics currently being hotly debated. This includes iLUC (indirect land use change), "Food vs. Fuel" and UFOP's call for political support for the introduction of a B30 fuel for the German utility vehicles market.

The importance of the project in press relations became clear on the occasion of the press event of 11 September 2012 at the Hockenheimring. Here, journalists had the opportunity to personally experience the so-called Bioconcept-Car. As part of the event, they also received information on the agricultural side of the project, which consistently uses bio-materials as well as rapeseed fuels.

BBE/UFOP specialist convention "Fuels of the Future"

For what is now the ninth time, the international biofuels industry came together on 23 and 24 January 2012 in Berlin for the BBE/UFOP specialist convention "Fuels of the Future". The inclusion of this primary event in the International Green Week and the specialist trade show on bioenergy and renewable resources "nature.tec", taking place within its framework, proved its value in 2011 and thus gave the participants the opportunity to once again take part in a bioenergy trade evening at the exposition. Over 500 invited participants from more than 30 countries were in attendance to discuss current industry developments, to exchange experiences, in particular those made with the implementation of sustainability standards as well as to make new contacts. The central focus of discussions here too was the iLUC problem, which was triggered by biomass cultivation for the production of biofuels.

International Green Week Berlin 2012

In 2012, the International Green Week once more featured in the exhibition programme of the UFOP. The association had two stands: one at the Farm Experience in Hall 3.2 and another at nature.tec – specialist show for bioenergy and renewable resources, which was held for the first time in Hall 5.2a at the Berlin Fair. The rapeseed oil campaign "Discover Rapeseed" was presented at the Farm Experience, while at the nature.tec stand the focus was on the topic "Rapeseed Fuels". For several years, UFOP has run a joint stand dealing with the topic of biofuel in cooperation with the Bundesverband der Deutschen Bioethanolwirtschaft (BDBe), the Verband der Deutschen Biokraftstoffindustrie (VDB), the Bundesverband Dezentraler Ölmühlen (BDOel) and the Verband der ölsaatenverarbeitenden Industrie in Deutschland (OVID). The stand covered a total area of 150 m^2 and consequently, the UFOP representatives were in a position to inform numerous IGW visitors about the most urgent questions relating to biofuels. In particular, discussions focussed on two topics: the effects of the increasing production of renewable resources and the proposals of the EU Commission on the indirect land usage change (iLUC) as a result of the production of biofuels. The specialist show was seen by a large number of politicians,

International Conference "Fuels of the Future"

Exhibition stand International Green Week

and discussion with them focussed on the proposals of the EU Commission for recognition of the indirect land usage change (iLUC). UFOP illustrated the serious consequences of these regulations – for example, on domestic rapeseed production. Several representatives of parliamentary groups and ministries were open to the UFOP arguments and offered further, more in-depth discussions on the topic.

Continuous press work

Traditional press work has been a core element of UFOP's public relations policy over the reporting period. Over 30 press releases relevant to various aspects of biodiesel and biofuel have been published, of which the formulation of positions and demands within the context of biodiesel legislation and sustainability have been the most important concerns. Here is an overview of the most important press releases related to the topic of biodiesel, etc. (from September 2011 to October 2012):

21 Sept 2012

Specialist seminar on the realignment of EU funding policies on biofuels and on current regulatory issues

This is the conclusion reached by the UFOP in its evaluation of the report. According to the report, considerable quantities of biodiesel from the year 2010 were charged to the quota year 2011 during the subsequent taxation process and are therefore quoted as a cause for the decline in domestic demand for biodiesel.

19 Sept 2012

Specialist seminar on the realignment of EU funding policies on biofuels and on current regulatory issues

The Directorate-General proposals on "Climate Policy" for modifications to the RES Directive and Fuel Directive require the biofuel industry to lead the way.

12 Sept 2012

Reliability of EU Commission policies on biofuel questioned

In the climate policy proposals announced by the Directorate-General of the EU Commission, the Union for the Promotion of Oil and Protein Plants e. V. (UFOP) perceives a complete departure from a reliable, future-oriented climate and biofuel policy.

12 Sept 2012

Rapper at the wheel and rapeseed in the tank

For the last 10 years, the musician and racing driver Smudo and his Four Motors team have been running a variety of Bioconcept-Cars – with rapeseed power providing sustainable power.

6 Sept 2012

UFOP welcomes the introduction of anti-dumping proceedings against Argentina and Indonesia

Following the application of the European Biodiesel Boards (EBB), the responsible advisory committee of the Commission agreed to the implementation of anti-dumping proceedings against biodiesel imports from Argentina and Indonesia.

31 Aug 2012

UFOP welcomes BLE initiative to intensify Europe-wide cooperation

UFOP expresses concern over the varying administrative practices when implementing the Renewable Energy Directive in national law.

24 Aug 2012

UFOP doubts scientific validity of study on greenhouse gases carried out by University of Jena

UFOP experts doubt the scientific validity of the study "Uncertainties about the GHG Emissions Saving of Rapeseed Biodiesel", a part of the "Jena Economic Research Papers" series. According to the association, it illustrates once again that studies not subjected to review by an impartial expert should not be published.

25 July 2012

REDcert system recognised by European Commission

The Union for the Promotion of Oil and Protein Plants e. V. (UFOP) welcomes the EU Commission decision as a meaningful milestone for the further development of the certification system of the German Agricultural and Biofuel industry, REDcert.

4 June 2012

Biofuel associations explain their position on indirect land usage change (iLUC) to representatives

Biofuel associations explain their position on iLUC in Brussels.

25 May 2012

DEUTZ AG approves engines for use with biodiesel

The Union for the Promotion of Oil and Protein Plants e.V. (UFOP) welcomes the Deutz AG approval of biodiesel as a pure fuel (B100) suitable for the Agripower engines of the TCD 6.1 L6 and TCD 7.8 L6 series.

22 May 2012

UFOP presents rapeseed fuels at the ADAC 24-hour race

On the occasion of this year's ADAC 24-hour race on the Nürburgring circuit, UFOP celebrated a small but significant anniversary. For the tenth time, the association supported the prominent artist and driver Smudo's rapeseed-powered racing car.

30 Apr 2012

Green pioneers at the 'Green Hell'

On 19 May, over 200,000 visitors are expected at the impressive field of the Nürburgring for this year's ADAC 24-hour race.

12 Apr 2012

AGQM introductory seminar on REACH registration

REACH has been the applicable European legislation for chemicals since mid-2007. It requires the registration of all substances placed on a European market. If this registration does not take place, the substance may not be introduced to the market.

8 Mar 2012

Increase in demand for diesel assists 2011 biodiesel sales

According to the Federal Statistics Office, the sales of biodiesel as an additive to diesel fuel (B7) increased from 2.236 million tonnes in 2010 to 2.329 million tonnes in 2011.

23 Feb 2012

New study: No hunger as a result of global agricultural prices – biodiesel and bioethanol are not the scapegoats

The simple formula that "hunger comes about due to high prices on the global agricultural markets" is incorrect. The effect on world market prices by the production of resources for biofuel production has also been greatly overestimated.

1 Feb 2012

IGW 2012: Huge interest in UFOP position on indirect land usage changes

At the IGW, the biofuel associations' joint stand at the nature.tec specialist show gave UFOP representatives an excellent opportunity to inform numerous visitors about the most urgent questions related to the biofuel industry.

24 Jan 2012

BBE/UFOP: Necessity for tax concessions for pure biogenic fuels also after 2012

The biofuel industry is campaigning for a follow-up arrangement for the tax incentives for pure biogenic fuels. The current incentives expire at the end of 2012. Expert, professional iLUC discussions are being carried out.

20 Dec 2011

UFOP publishes report on the international biodiesel markets

On behalf of the Union for the Promotion of Oil and Protein Plants e.V. (UFOP), Ecofys Germany GmbH has created a report on the market development of biodiesel on the German and international biodiesel markets.

20 Dec 2011

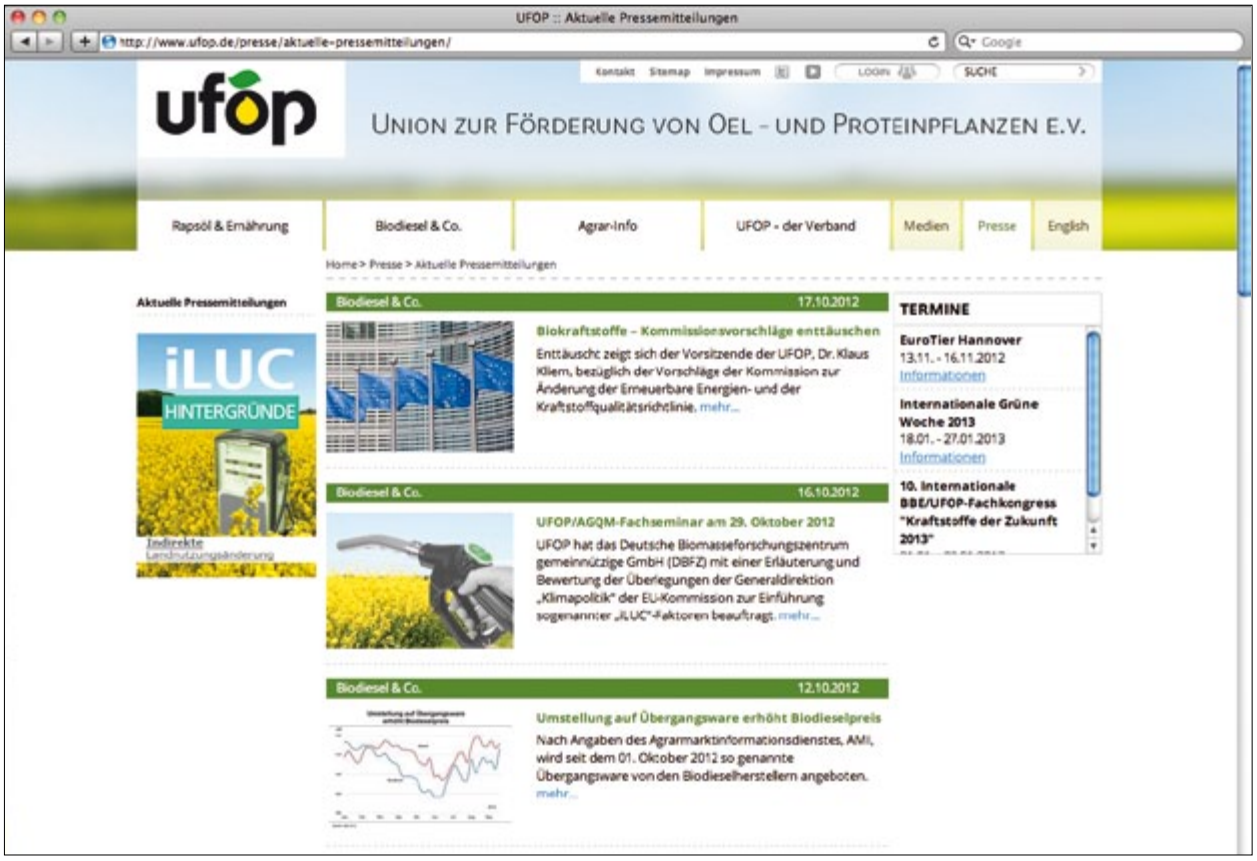
Ceremonial launch of the HVO production facility in Rotterdam

On 19 December 2011, Neste Oil AG began operations in their new production facility in Rotterdam. The facility has the capacity to produce 800,000 tonnes of hydrotreated vegetable oil (HVO).

5 Dec 2011

UFOP invites submissions for competition to redesign Smudo's bio-racer

What should the rapeseed-powered racing car of musician Smudo look like for the forthcoming season? Fans of the artist and ambitious racing driver are invited to submit drafts for the redesign of the Scirocco 2.0 TDI.



UFOP-Website

1 Dec 2011

Green Week 2012: nature.tec specialist show in the context of the energy revolution

Biofuels for road and air transport are the focus of the specialist show at the International Green Week.

15 Nov 2011

UFOP resolutely rejects the introduction of biofuel-specific iLUC factors

UFOP resolutely rejects the introduction of biofuel-specific iLUC factors. The introduction of increased greenhouse gas penalties would mean the end of the European biodiesel industry as of 2017.

11 Nov 2011

The death of the oil mill continues

In the last three years, approximately 200 decentralised oil mills in Germany have had to cease operations. Currently, of the 600 oil mills previously in operation, only 274 continue to process regional oil seeds.

28 Oct 2011

Huml and Bomba: Developing "regenerative diesel" as a sustainable fuel – successful completion of one-year practical trial by Hochschule Coburg

The new biofuel "regenerative diesel" could help protect the environment while simultaneously reducing the dependency on crude oil. "The project was a huge success", pointed out State Secretary in the Ministry for Environment, Melanie Huml at the presentation of the results.

11 Oct 2011

Biodiesel is a quality fuel with a future

On 6 and 7 October 2011, the AGQM organised the 5th International Conference on biodiesel, with talks on the political framework conditions for the marketing of biodiesel, on qualitative aspects and the engine-related requirements for the fulfilment of the exhaust emission standards.

6 Oct 2011

Negative effects of biodiesel on exhaust gas aftertreatment systems much less than previously assumed

A brief UFOP study took more than 7,900 market-relevant pieces of analytical data from the last 10 years into account.

Expert commission on biofuels and renewable resources

In the reporting period, the meeting of the UFOP expert commission on biofuels and renewable resources took place in Mannheim on 12 June 2012 at the invitation of Fuchs Europe Schmierstoffe GmbH. The day before the meeting, the members were offered the chance to view the biodiesel production procedure, beginning with the processing of raw materials and oil production at the Bunge Deutschland GmbH oil mill, before continuing to the biodiesel production facility at Mannheim Bio Fuel GmbH. The material-based application of vegetable oil was demonstrated at the Fuchs Europe Schmierstoffe GmbH facility.

The meeting focussed on energy and material-based applications.

Dr. Hans-Jürgen Froese of the Federal Ministry for Food, Agriculture and Consumer Protection (BMELV), explained the Federal Government's action plan for the material-based use of renewable resources and, in particular, the progress of the implementation, as well as the Federal Government's other planned activities. The action plan is divided into twelve fields of action. These include measures to secure the resources base, for example, by increasing yields or by developing additional arable land. Within the "Securing Sustainability" field, the priority is to ensure that biomass production follows defined criteria for sustainability. As a result of a project planned by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), a "forum on sustainable palm oil" was created, amongst others. Dr. Hans-Jürgen Froese underlined that biofuels play a leading role in terms of sustainability certification and that in the future this requirement would apply to all applications of a biomass origin. In terms of utilisation of synergies, the certification systems created for biofuels should also be used for other biomass applications. Dr. Hans-Jürgen Froese was convinced that, in principle, sufficient biomass is available, however the production of food takes priority. Consequently, energy and material-based applications must be linked more efficiently by cascading use of the material flow. However after the presentation of the Federal Government's biorefinery concepts, the expert commission expressed concerns that the extremely high investment requirements were reminiscent of the example of the CHOREN BTL facility, which would significantly hamper entry into this processing technology for renewable resources.

During his lecture, Dr. Norbert Holst, FNR, presented the focal points of the research and development funding for the material-based application of rapeseed and sunflower oil. He focussed in particular on the significance of vegetable oils for oleochemicals and briefed that, in the vegetable oils and fats sector, there are currently 49 projects being supported by a total funding volume of approximately EUR 12 million. Dr. Norbert Holst presented comprehensive FNR information, in particular regarding the Internet database www.bioschmierstoffe.de. Even though the market share of bio-lubricants currently amounts to only 5 %, the speaker expects a definite increase in demand, necessitated by the increase in environmental regulations regarding the use of operating materials in environmentally sensitive areas.

Rolf Luther of Fuchs Europe Schmierstoffe GmbH provided information on the state of affairs of the EU lead market initiative. A central theme in the corresponding expert groups was, amongst others, the question of agreement on the meaning of the term "environmentally compatible". Here, the decisive factor is the criteria relevant to the verification of biological degradability. This characteristic, however, cannot be applied exclusively to bio-based products, therefore when applying the term "bio-based", the origin of the resources is of particular relevance. In 2007, the EU Commission launched the lead market initiative in order to subsequently promote the Europe-wide market introduction of the potential of bio-based products. For this, the standardisation of the minimum requirements for bio-lubricants and bio-based lubricants in the form of homogenous EU-wide requirement criteria was necessary. These were published in November 2011 in the form of a technical report. These minimum requirements, as desired by the Commission, should now be converted to technical standards. This also applies to the preparation of resources certified as sustainable.

As part of the subsequent focal point, "energy-based application", Christoph Pabst and Johann Heinrich von Thünen-Institut (vTI) presented the results hitherto of the UFOP-supported project "Interactions between fuels with high biogenic content using the example of engines with SCR". The most important question related to the required AdBlue dosage (urea) relative to the content of the biodiesel blend. In this context, it was determined that nitrogen oxide emissions also increase when

biodiesel is used due to the fact that the required urea (AdBlue) dosage is optimised for diesel fuel and therefore does not react appropriately for biodiesel. Consequently, as the project continues, bio-components containing HVO will be tested in order to determine the optimal blend combinations and synergy effects. In principle, the discovery of the exact dosage is an achievable goal provided that the adaptation requirements outlined by the project are implemented in the fuel sensor in the engine management. With such a sensory system, it would be possible to determine the appropriate fuel/biofuel combination for the corresponding AdBlue dosage amount.

Christoph Pabst then presented the biodiesel test results, of which the boiling curve had been reduced as a result of metathesis. The project showed an increase in fuel consumption relative to fossil diesel fuel, but not to the same extent as RME. The project confirmed that aligning the boiling point curve of biodiesel to diesel fuel is possible in principle and that the resultant problem of oil dilution reduces considerably. In the talk that followed, the perspective of the manufacturing process, necessitated by the very high costs of the required catalysers, was questioned.

Prof. Dr. Jürgen Krahl of Hochschule Coburg reported on the results of the "Regenerative diesel" fleet test. As part of the project, a vehicle fleet was tested with a fuel consisting entirely of HVO and a blend component with 2 % or 7 % biodiesel. The result shows that, while engine compatibility is basically there, HVO does bring about higher NOx emissions. Not limited components were also examined for their mutagenic effect. A mutagenic effect could not be proven in EURO-V and EURO-VI vehicles. The fuel consumption did however increase compared to diesel fuel by around 4 %. With the aim of introducing HVO as a blend component to the market, while taking the standards requirement for diesel fuel into account (EN 590), Prof. Dr. Jürgen Krahl presented a further project which was due to start by the end of 2012. Named "R33", a fuel is to be tested which consists of 26 % HVO, 7 % biodiesel and diesel fuel.

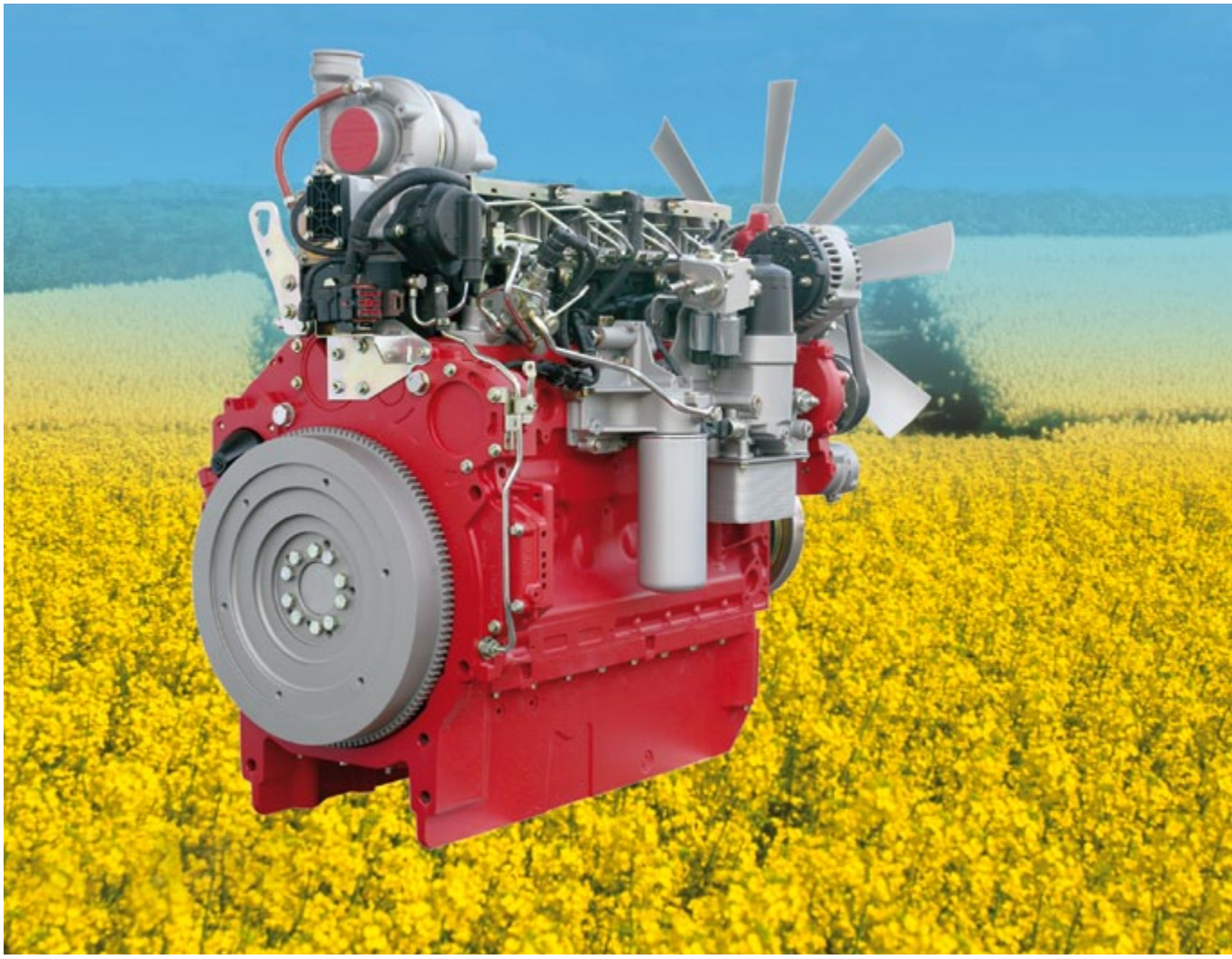
Markus Winkler of Deutz AG, summarised the results of the endurance tests and trial field tests on Deutz engines of emission class III B with SCR systems for the approval of biodiesel (B100). The trial field test has finished with the appraisal of the injection systems not yet completed by Bosch by the time of the meeting. While Deutz AG has since granted its biodiesel approval for engines of this exhaust class, it needs to be noted that the motor oil is to be changed every 250 operating hours and a fuel filter suitable for biodiesel installed.

Dr. Ulrike Schümann of the University of Rostock explained the results of the FVV organisation's project on "Change in fuel properties under extreme ancillary conditions – Deposits in the common rail system". Preceding this project were scientific analyses of the processes of plate-out in high-pressure injection systems. It was possible to prove that there is a significant relationship between fuel quality and the tendency for deposits to form. Part of the project is to continue examining the mechanisms of deposit formation in detail. This comprehensive project is funded by FVV, FNR, AGQM and UFOP. Stefan Innerhofer of regineering GmbH presented a project on the topic of "Using the inner-motor potential of biodiesel by recognising specific fuel properties in the common rail diesel motor". The aim of this project is to examine different fossil fuels with different shares of RME and their optimisation potential in single cylinder motors with an open motor management system. At the end of the meeting, Prof. Dr. Helmut Tschöke of the University of Magdeburg reported on a project on testing high injection pressures on fuel-mixture generation with the aim of increasing the degree of efficiency by greatly increasing the injection pressure (up to 4000 bar) while simultaneously reducing fuel consumption. Within the framework of this project, it was possible to prove the relationship between fuel injection, fuel-mixture generation and combustion and emissions at high injection pressures. The tests of this project are not yet completed and need to be continued on an entire engine, amongst others.

What modern injection systems need to do and why fuel quality is so important:

In EURO VI, common rail is continuing to grow in importance as a pressure accumulator. The injection pump manufacturer, Delphi, relies on systems which can supply pressure of up to 3000 bar.

Modern facilities can determine the time of injection to within half a millisecond - that corresponds to 0.2 beats of a bee's wing. The quantity of diesel of the pre-injection can amount to a millicubicmeter - the space the tip of a safety pin would occupy. The pressures in the system reach up to 2500 bar - pressure that a 40-tonne truck would exert on the area of a stamp. The individual drops of diesel shoot out of the injector at a speed of 2400 km/h - as fast as a jet fighter. The tolerances of the clearances of all this is just 1 µm (0.001 mm) – 50-times thinner than the width of a hair. (Source: Delphi)



UFOP projects

Influence of ternary mixtures of diesel fuel, rapeseed oil methyl ester and hydrotreated vegetable oil (HVO) on the emissions of a utility vehicle's engine with SCR exhaust after treatment.

Project monitoring:
Johann Heinrich von Thünen-Institut, Bundesallee 50,
38116 Braunschweig

With the introduction of the EURO-V exhaust standard for utility vehicles and exhaust standard EURO VI for passenger cars, the use of SCR exhaust aftertreatment systems is mandatory in order to satisfy the considerably lowered limit values for nitrogen oxides and particles in exhaust fumes. The results of the UFOP-funded project "Systematic examinations of the interaction of fuels with high biogenity content using SCR engines as an example" have shown that the higher the admixture share of biodiesel, the more nitrogen oxide there is in the exhaust fumes, becoming even stronger when an SCR catalyser is used. Only different mixtures of diesel fuel and biodiesel have been examined to date.

With the aim of countering this negative effect while simultaneously increasing the share of renewable resources in fuel, the influence of the mixture of diesel fuel, biodiesel and hydrotreated vegetable oils (HVO - ternary mixture) on emissions is to be examined as part of the extension of the grant.

It is well known that the application of HVO is preferred to that of biodiesel by the automotive industry. UFOP accommodates this requirement in its project, however those biodiesel (RME) admixtures which correspond to the current discussion on the further development of the European diesel fuel standard are also being examined. For this reason, alongside blends of diesel fuel, biodiesel and HVO, the use of B30 compared to diesel fuel and B100 (RME) will also be tested.

The results of this grant will be the extensive emission inspections with SCR on mixtures of diesel fuel and biodiesel as well as diesel fuel, biodiesel and HVO. It is hoped that the results will be published in the motoring magazine "Motortechnische Zeitschrift" (MTZ).

Using the inner-motor potential of biodiesel (FAME) by recognising the specific fuel properties in the common rail diesel motor

Project monitoring:
regineering GmbH, Alemannenstraße 25, 85095 Denkendorf

Over the past few years, UFOP has supported a number of projects on the use of biodiesel as a pure fuel or as a blend component in diesel fuel while paying particular attention to the requirements of emissions regulations. The central focus of this project was on whether or not the legal and non-legal limited exhaust threshold values (aldehydes, PAHs, particle count, etc.) of biodiesel would be met. However, an increasing number of complaints are coming from the scientific institutes stating that the optimum combination of injection time, progression, etc. cannot be examined due to the increasing emissions regulations, the revision of test cycles for the approval (certification) of diesel motors and the increasingly laborious exhaust aftertreatment. The reason for this is the fact that the automotive industry does not provide the full motor management/control unit software in which the so-called engine characteristic maps are stored for the required tests. In this regard, alternative fuels are tested, usually in engines based on the set motor-technical optimisation for diesel fuel.

This project tests the optimisation procedure of the afore-mentioned parameters when testing B30 and B100 compared to B7 based on a single-cylinder engine with an open engine control unit.

Change in fuel properties under extreme ancillary conditions – Deposits in the common rail injectors

Project monitoring:
Work group for reciprocating engines and combustion motors, University of Rostock, Universitätsplatz 1, 18051 Rostock

In accordance with the European diesel fuel standard EN590, the blending of biodiesel is limited to a maximum volume of 7 %. The reason for this restriction is because the automobile and injection pump manufacturers are concerned that a higher share of biodiesel will bring about problems in the motor and injection systems, like deposit formation, for example. From January 2014, cars and utility vehicles will have to meet the exhaust standard EURO VI. These emission regulations will be achieved, among others, by increasing the number of injection holes and reducing their diameter as well as increasing the injection pressures from the current maximum of 2000 bar to 2500-3000 bar with the following targets:

- Reduction of motor oil dilution thanks to improved combustion;
- Reduction of raw gas emissions in order to make the work of exhaust aftertreatment easier (lifetime, maintenance extension);
- Reduction of the noise level using multiple pre and post-injections for each combustion cycle.

Deposits in these components will lead to a restricted combustion process and thus to an increase in exhaust emissions, especially when the blend components like biodiesel increase the susceptibility of deposits forming even more.

The project topic "Modelling the formation of internal deposits in common rail injectors" is work packet five of a project that consists of a total of six work packets. The project is sponsored in the main by the combustion engines research group (Forschungsverreinigung Verbrennungsmaschinen (FVV)) and the FNR. Volkswagen AG provides the engine and the expertise (motor management), among other things. Finally, as part of extensive chemical-analytical fuel tests, those biofuel combinations which will be subjected to engine testing will be determined. The basis for these tests are various biodiesel blends (up to B20). The central focus of UFOP-funded work packet five is the simulation and mathematical modelling of deposit formation with the aim of being able to calculate the deposit formation potential of blended fuel combinations.

Members of the UFOP expert commissions

As of: August 2012

Expert commission on biofuels and renewable resources

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Prof. Dr.-Ing. Axel Munack
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F&E-Zentrum
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Table 1: Domestic consumption – Biofuels 2006–2011 in 1,000 t

	2006	2007	2008	2009	2010	2011+
Biodiesel admixture	934.7	1,423.3	1,612.8	2,276.3	2,236.0	2,353.1
Biodiesel pure fuel	not specified	1,821.3	1,082.5	240.6	293.1	102.8
Sum - Biodiesel	-	3,244.6	2,695.3	2,516.9	2,529.1	2,455.9
Vegetable oil	not specified	755.8	401.4	100.0	60.9	19.6
Sum - Biodiesel & V-oil	-	4,000.5	3,096.7	2,616.9	2,590.0	2,475.5
Diesel fuel	29,134.0	29,058.8	29,905.6	30,936.2	32,128.0	32,643.5
Admixture share in %	3.2	4.9	5.4	7.4	7.0	7.2
Sum - Fuels	not specified	31,635.9	31,389.4	31,276.8	32,482.0	32,765.9
Biodiesel & V-oil share in %	not specified	12.6	9.9	8.4	8.0	7.6
Bioethanol ETBE	448.3	366.2	366.9	202.3	122.2	163.1
Bioethanol admixture	63.5	88.6	250.9	692.7	1.028.1	1.059.6
Bioethanol E 85	-	6,1	8,5	9,0	18,1	16,2
Sum - Bioethanol	511.8	460.0	625.0	902.5	1,165.3	1,238.8
Motor fuels	22,604.0	21,292.0	20,561.4	20,232.8	19,614.8	19,607.9
Motor + bioethanol fuels	22,604.0	21,243.0	20,568.5	20,240.2	19,629.8	19,621.1
Bioethanol share in %	2.3	2.2	3.0	4.5	5.9	6.3

Source: Federal Office of Economics and Export Control, AMI

Table 2: Monthly domestic consumption – Biofuels 2007–2011 in 1,000 t

	2007	2008	2009	2010	2011+
Biodiesel admixture					
January	92.91	135.05	125.55	175.66	157.70
February	98.19	117.40	176.07	149.07	147.04
March	107.19	122.26	181.10	190.61	172.46
April	111.98	135.35	195.36	207.83	188.48
May	117.07	130.45	194.28	202.72	210.11
June	122.29	137.81	192.06	193.79	184.95
July	119.85	143.87	203.74	200.04	226.27
August	133.89	133.63	209.86	190.56	225.60
September	129.10	139.32	204.82	191.20	190.39
October	127.71	149.92	194.01	198.09	214.12
November	132.71	130.71	211.37	196.24	218.99
December	130.46	137.06	184.35	166.38	216.99
Average	**118.61**	**134.40**	**189.38**	**188.52**	**196.09**
Biodiesel pure fuel					
January	131.28	64.93	14.12	18.79	3.57
February	122.29	37.15	27.22	10.98	4.94
March	150.94	73.75	37.29	19.04	8.20
April	144.83	84.91	28.10	22.96	3.35
May	158.47	114.10	16.10	38.84	4.67
June	146.17	139.25	14.05	39.44	7.29
July	171.38	120.95	20.01	27.75	4.77
August	133.05	111.74	21.23	40.02	5.02
September	178.07	111.42	31.47	36.13	10.34
October	188.73	114.81	21.71	22.90	9.42
November	158.83	59.31	21.43	10.70	8.28
December	137.25	50.14	12.49	5.50	32.91
Average	**151.77**	**90.21**	**22.10**	**24.42**	**8.56**
Sum - Biodiesel					
January	224.19	199.98	139.67	194.46	161.27
February	220.47	154.55	203.29	160.05	151.99
March	258.13	196.01	218.39	209.66	180.66
April	256.81	220.26	223.46	230.79	191.83
May	275.54	244.56	210.38	241.56	214.78
June	268.46	277.05	206.11	233.22	192.24
July	291.23	264.82	223.75	227.79	231.05
August	266.93	245.37	231.09	230.58	230.63
September	307.17	250.74	236.29	227.32	200.72
October	316.45	264.73	215.72	220.99	223.54
November	291.54	190.02	232.80	206.95	227.28
December	267.71	187.20	196.84	171.88	249.90
Average	**270.39**	**224.61**	**211.48**	**212.94**	**204.66**

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	2007	2008	2009	2010	2011+
Vegetable oil (V-oil)					
January	29.67	25.84	8.62	4.12	0.51
February	79.63	24.16	4.68	2.76	1.21
March	45.70	20.52	5.81	7.97	1.06
April	45.66	28.38	8.40	6.60	3.24
May	37.77	32.44	6.19	5.68	2.41
June	99.99	38.30	8.37	5.83	0.97
July	68.54	33.31	8.93	6.37	0.43
August	90.79	49.66	8.83	6.33	0.57
September	61.37	44.09	11.99	3.97	2.53
October	74.63	41.49	11.11	4.99	2.27
November	58.59	28.02	8.54	3.98	2.18
December	63.51	35.17	7.70	2.32	2.26
Average	**62.99**	**33.45**	**8.26**	**5.08**	**1.64**
Bioethanol					
January	41.29	40.41	66.45	83.28	87.25
February	37.32	38.06	59.62	75.13	93.42
March	47.49	52.92	78.66	87.83	83.27
April	43.03	51.10	86.73	91.95	89.18
May	37.47	53.72	79.74	102.83	108.24
June	39.95	45.20	77.70	103.28	105.89
July	39.21	50.30	89.40	117.17	111.29
August	38.97	49.55	77.09	105.26	112.76
September	34.90	46.24	75.62	101.92	111.63
October	34.54	63.28	68.81	98.98	109.84
November	29.23	61.84	66.20	95.67	114.02
December	36.61	72.38	71.42	98.39	109.08
Average	**38.33**	**52.08**	**74.79**	**96.81**	**102.99**

Source: Federal Office of Economics and Export Control, AMI

Table 3: Foreign trade with biodiesel 2008–2011 in t

	2008	2009	2010	2011
Import of biodiesel				
January	9,458	64,876	67,044	81,220
February	35,123	51,191	74,784	75,692
March	29,340	75,210	88,039	74,597
April	52,399	60,175	58,430	131,253
May	72,735	96,561	150,943	109,744
June	73,299	84,527	154,608	148,860
July	113,357	89,319	136,781	139,330
August	122,054	134,946	136,321	134,344
September	68,727	94,197	128,279	117,148
October	41,454	73,277	87,527	121,806
November	25,766	55,632	104,588	117,909
December	30,342	111,047	73,386	107,356
Total	**674,054**	**990,958**	**1,260,730**	**1,359,259**
Export of biodiesel				
January	18,372	28,703	68,836	60,507
February	54,525	55,936	97,385	129,082
March	33,589	54,081	95,514	100,646
April	41,708	36,946	78,214	135,269
May	53,982	41,715	103,827	131,876
June	17,076	46,299	114,460	157,211
July	117,266	73,904	89,507	116,598
August	94,854	68,716	166,430	99,556
September	71,094	106,998	85,514	144,816
October	137,768	85,795	107,993	105,822
November	57,571	81,105	78,703	85,560
December	77,464	81,202	126,207	74,957
Total	**775,268**	**761,400**	**1,212,590**	**1,341,900**

Source: Federal Statistical Office, AMI

Table 4: EU production capacities for biodiesel 2006–2011 in 1,000 t

	2006	2007	2008	2009	2010	2011
Germany	2,681	4,361	5,302	5,200	4,933	4,932
France	775	780	1,980	2,505	2,505	2,505
Italy*	857	1,366	1,566	1,910	2,375	2,265
Netherlands	-	115	571	1,036	1,328	1,452
Belgium	85	335	665	705	670	710
Luxembourg	-	-	-	-		,
United Kingdom	445	657	726	609	609	404
Ireland*	-	6	80	80		76
Denmark	81	90	140	140		250
Greece	75	440	565	715	662	802
Spain	224	508	1,267	3,656	7,100	4,410
Portugal	146	246	406	468		468
Austria	134	326	485	707	560	560
Finland*	-	-	170	340	340	340
Sweden	52	212	212	212	277	277
Estonia	20	35	135	135	135	135
Latvia	8	20	130	136	147	156
Lithuania	10	42	147	147	156	147
Malta	3	8	8	8	5	5
Poland	150	250	450	580	710	864
Slovakia	89	99	206	247	156	156
Slovenia	17	17	67	100	105	113
Czech Republic	203	203	203	325	427	427
Hungary	12	21	186	186	158	158
Cyprus	2	6	6	20	20	20
Bulgaria	-	65	215	435	425	348
Romania	-	81	111	307	307	277
EU-27	**6,069**	**10,289**	**16,000**	**20,909**	**21,904**	**22,117**

Note: Calculation based on 330 working days/year/plant;
* = from 2007 incl. production capacities for hydrotreated vegetable oil (HVO)
Source: European Biodiesel Board, national statistics, AMI

Table 5: EU production of biodiesel 2005–2010 in 1,000 t

	2005	2006	2007	2008	2009	2010
Germany	1,669	2,662	2,890	2,819	2,539	2,861
France	492	743	872	1,815	1,959	1,910
Spain	73	99	168	207	859	925
Italy	396	447	363	595	737	706
Belgium	1	25	166	277	416	435
Poland	100	116	80	275	332	370
Netherlands		18	85	101	323	368
Austria	85	123	267	213	310	289
Portugal	1	91	175	268	250	289
Denmark/Sweden	72	93	148	231	233	246
Finland*			39	85	220	288
Czech Republic	133	107	61	104	164	181
Great Britain	51	192	150	192	137	145
Hungary			7	105	133	149
Slovakia	78	82	46	146	101	88
Lithuania	7	7	9	30	98	85
Greece	3	42	100	107	77	33
Latvia	5	10	26	66	44	43
Romania		10	36	65	29	70
Bulgaria		4	9	11	25	30
Estonia	7	1	0	0	24	3
Ireland*		4	3	24	17	28
Slovenia	8	11	11	9	9	22
Cyprus	1	1	1	9	9	6
Malta	2	2	1	1	1	0
EU-27	**3,184**	**4,890**	**5,713**	**7,755**	**9,046**	**9,570**

Note: * = from 2007 incl. production capacities for hydrotreated vegetable oil (HVO)
Source: European Biodiesel Board, national statistics, AMI

Table 6: Biodiesel production capacities in Germany, 2012

Operator/Facility	Location	Capacity (t/year)	
ADM Hamburg AG – Hamburg plant	Hamburg	still uncertain	●
ADM Hamburg AG – Leer plant	Leer	still uncertain	●
ADM Mainz GmbH	Mainz	still uncertain	●
Bioeton Kyritz GmbH	Kyritz	80,000	●
BIO-Diesel Wittenberge GmbH	Wittenberge	120,000	●
Bio-Ölwerk Magdeburg GmbH	Magdeburg	255,000	●
BIOPETROL ROSTOCK GmbH	Rostock	200,000	●
Biowerk Sohland GmbH	Sohland	50,000	●
BKK Biodiesel GmbH	Rudolstadt	4,000	
BKN Biokraftstoff Nord AG (formerly Biodiesel Bokel)	Bokel	35,000	
Cargill GmbH	Frankfurt/Main	300,000	●
DBE Biowerk GmbH	Tangermünde/Regensburg	99,000	
Delitzscher Rapsöl GmbH & Co. KG	Wiedemar	4,000	
EAI Thüringer Methylesterwerke GmbH (TME)	Harth-Pöllnitz	55,000	●
ecodasa GmbH	Burg	50,000	
ecoMotion GmbH	Lünen	212,000	●
Emerald Biodiesel Ebeleben Gmbh	Ebeleben	90,000	
Emerald Biodiesel Neubrandenburg GmbH	Neubrandenburg	40,000	
german biofuels gmbh	Falkenhagen	130,000	●
G.A.T.E. Global Altern. Energy GmbH	Halle	58,000	
HHV Hallertauer Hopfenveredelungsgesellschaft mbH	Mainburg	7,500	●
KFS-Biodiesel GmbH	Cloppenburg	30,000	
KL Biodiesel GmbH & Co. KG	Lülsdorf	120,000	
LPV Landwirtschaftliche Produkt-Verarbeitungs GmbH	Henningsleben	5,500	●
Louis Dreyfus commodities Wittenberg GmbH	Lutherstadt Wittenberg	200,000	●
MBF Mannheim Biofuel GmbH	Mannheim	100,000	●
NEW Natural Energie West GmbH	Neuss	260,000	●
Nehlsen GmbH	Grimmen	33,000	
Osterländer Biodiesel GmbH & Co. KG	Schmölln	4,000	
Petrotec GmbH	Südlohn	85,000	
LubminOil	Lubmin	60,000	
Rapsol GmbH	Lübz	6,000	●
Rapsveredelung Vorpommern	Malchin	38,000	●
Rheinische Bioester GmbH	Neuss	150,000	
Südstärke GmbH	Schrobenhausen	100,000	
SüBio GmbH	Themar	4,000	
TECOSOL GmbH (formerly Campa)	Ochsenfurt	75,000	●
Ullrich Biodiesel GmbH/IFBI	Kaufungen	35,000	
Verbio Diesel Bitterfeld GmbH & Co. KG (MUW)	Greppin	190,000	●
Verbio Diesel Schwedt GmbH & Co. KG (NUW)	Schwedt	250,000	●
Vesta Biofuels Brunsbüttel GmbH & Co. KG	Brunsbüttel	150,000	
Vital Fettrecycling GmbH, Werk Emden	Emden	100,000	
Vogtland Bio-Diesel GmbH	Großfriesen	2,000	
Total (without ADM)		**3,787,000**	

Note: ● = AGQM member;
Source: UFOP, FNR, VDB, AGQM / some names are abbreviated
DBV and UFOP recommend procuring biodiesel from members of the working committee
As of: August 2012

Table 7: Foreign trade with ethanol (ethylalcohol, denatured) 2006–2011 in t

	2006	2007	2008	2009	2010	2011
Import of ethanol						
January	9,651	5,139	5,498	6,631	9,232	9,505
February	6,346	7,883	7,743	5,977	10,260	10,779
March	9,085	5,528	3,536	7,191	14,534	8,519
April	5,540	11,158	4,510	6,563	4,663	9,537
May	15,290	6,555	4,806	6,665	6,205	6,747
June	7,046	9,092	3,770	6,473	6,825	7,878
July	3,783	11,203	20,038	6,473	7,966	7,298
August	5,129	7,674	3,574	10,185	6,888	7,463
September	6,154	9,889	5,518	7,507	8,786	14,225
October	7,208	10,974	10,969	8,138	8,953	10,984
November	7,304	7,818	7,277	9,264	8,932	15,069
December	8,722	7,641	6,345	10,587	8,613	12,328
Total	**91,270**	**100,551**	**83,584**	**91,654**	**101,857**	**120,332**
Export of ethanol						
January	2,325	2,685	1,685	2,012	2,039	3,575
February	2,461	2,162	5,077	3,356	1,747	1,928
March	1,576	7,314	1,505	1,724	1,691	3,364
April	3,654	2,116	1,821	1,741	1,500	1,780
May	2,383	1,474	3,578	1,810	1,274	3,088
June	1,770	1,893	4,780	1,696	1,481	4,535
July	2,058	1,408	6,018	1,208	2,163	4,525
August	572	1,757	1,953	1,515	2,059	3,298
September	3,872	1,682	1,690	1,650	2,488	3,621
October	1,387	2,577	4,339	1,911	3,134	7,834
November	1,759	2,459	1,960	1,662	1,461	3,776
December	2,039	1,944	1,295	1,370	1,496	4,468
Total	**25,855**	**29,471**	**35,699**	**21,655**	**22,533**	**45,792**

Source: Federal Statistics Office, AMI

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