

Biodiesel – a Situation Report and Forecast

Rapeseed Market with Good Perspectives

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Experts generally agree that for now only biofuels will play an important part in strategic supplies on the way to long-term sustainable mobility in the transport sector, while biofuels are also seen to make an important contribution in fulfilling climate conservation obligations. Germany's leading technical position in the EU in developing production capacities for biodiesel and also for vegetable oils and bioethanol is a result of Germany's promotional political framework (biofuel quota legislation) and the current market environment of comparatively high fossil fuel prices.

The sharply increased use of vegetable oils as fuel in Germany can be regarded as unique in the European Union. Vegetable oil fuels like biodiesel replace fossil diesel fuels and are therefore in direct competition with each other.

The tax credits and contribution of biodiesel and vegetable oil fuels to the quota obligations in Germany is connected with the standard requirements defined for the minimum quality criteria for biodiesel, vegetable oil and bioethanol. Biodiesel and vegetable oil may only be sold from duty-free stock as tax-reduced fuel if these fuels fulfil the respective requirements of the DIN EN 14214 and E DIN 51605 standards. Connecting the required technical criteria with the political promotion conditions emphasises the objective of the German government to move (enhance) the quality development of biofuels forward given increasing legal requirements on the emissions of vehicles.

Possible technology and applications

German companies have now become world leaders in technical developments for the production of biodiesel and bioethanol. Biodiesel manufacturers with an integrated oil mill secure secure raw material sources at the primary stage of production, i.e. the agricultural market, and thus the potential value of the rapeseed by-product rapemeal / cake when sold onto the animal feed market.

The technical development in Germany can claim a competitive advantage / bonus in providing biodiesel from manufacturer / factory at superior quality – a quality above the standard / norm requirements. This is confirmed by internal examinations by the "Arbeitsgemeinschaft Qualitätsmanagement Biodiesel e.V." (www.agqm-biodiesel.de).

The economical and also the ecological balance is improved by pursuing the aim of optimum by-product usage of glycerine (from biodiesel production), rapeseed meal / cake (from the oil mill), and DDGS from drying the swill – a by-product of bioethanol production. Biodiesel production in particular targets with the usage of the by-product glycerine highly priced segments of the oleochemical industry. In view of the increasing volumes of glycerine, potential new markets are therefore the subject of research and development.



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Biodiesel and bioethanol form for the time being the basis of German and European biofuel supplies. The production of bioethanol from hemicellulose and synthetic fuels from biomass (Biomass to Liquid, BtL) are very likely to remain in the development phase for at least another 10 years, which will be followed by the gradual establishment of capacities. However, promising technical concepts in this field are currently explored / pursued. These could provide market access for a wider range of biomass. The combination of different techniques and biomass origins with the objective of the production of high-quality biodiesel, bioethanol and BtL is an evolutionary process. The different biofuels should complement not exclude each other. - only this way can all the available biomass potentials be mobilised.

Market developments in Germany / world-wide

Total production capacity for biodiesel in Germany will reach approx. 5 million tonnes in 2007/08 (Fig.1), which includes all plants currently under construction and in planning.

This capacity can cover 16% of the energy demand in Germany for diesel fuel, based on the consumption of diesel fuel in Germany of around 29 million t. With every litre of biodiesel, an average of 2.2 kg (source: ifeu, 2003) and, on the basis of total capacity, around 12 million tonnes of climate-damaging gases are saved.

The sales network is also becoming more dense / is increasing in coverage. Biodiesel has now become established in the mineral oil market as a bulk commodity and is now supplied by around 1,900 filling stations, i.e. at every 9th public station.

Biodiesel sales in 2006: According to a survey by the "Arbeitsgemeinschaft Qualitätsmanagement Biodiesel e.V." (www.agqmbiodiesel.de), the transport industry was the most important customer for the German biodiesel sector in 2006, with total sales of 1.25 million tonnes. The second most important customer for biodiesel in 2006 was the mineral oil industry, which used around 1 million tonnes of biodiesel for admixture to conventional diesel. 152,000 tonnes were sold at public filling stations to car owners and around 90,000 tonnes of biodiesel were used in agriculture (Fig.2).

During the same period, the use of vegetable oil as a fuel increased to over 1.000,000 tonnes in 2006. Vegetable oil has therefore become a serious competitor to fossil fuels in the utility vehicle sector within a very short time, particularly for the biodiesel industry. Given a total of 3.5 million tonnes, more than 12% of the diesel demand in Germany was covered by biodiesel or vegetable oil. Thus the volume targets for this market segment of at least 10% demanded by the European Union for the year 2020 for all member states has already been exceeded. Consumption in 2007 is estimated to increase by approx. 1% - too little with regard to the total existing capacity (Fig. 3). Given the current positive price situation, the biodiesel branch needs to substantially increase the sales of pure fuels since only 5% by volume and thereby approx. 1,4 million tonnes can be sold for admixture, according to the current European standard for Diesel – DIN EN 590 –.

As a result of the resolution at the EU summit in February 2007 to set the minimum biofuel content for all member states at 10% of total energy by 2020, pressure to improve the market integrations of biofuels in the European Union has increased. Similar to Germany, minimum volumes for biofuels have been or will be introduced at national levels for biofuels. In some cases these are connected with a period of tax credits. However,

German biodiesel manufacturers consider it necessary to create an internal European market for biofuels to permit unlimited trading. National policies like in France, which make imports practically impossible, should be abolished. Otherwise it makes no sense to use EU structural funds to create biofuel plants in so called target 1 regions (regions in the EU with a high unemployment rate), like in Eastern Germany, where existing companies are already at a financial risk (or bankrupt in the near future) and probably at the same time grants from the EU structure funds are used to build new biodiesel plants in the new member states which increase the overcapacity within the "EU-market".

Outside the European Union the most important agricultural countries have now also introduced target volumes for biofuels on the fuel market. Traditionally, these include countries like Brazil and the USA, and more recently Canada, Malaysia, Thailand, Indonesia and China, totalling around 30 countries world-wide IEA, Task 39 "Biofuel Implementation", www.ufop.de/downloads/biofuel_agenda.pdf).

Depending on the development of crude oil prices, biofuels should therefore soon become established on the fuel market in the medium term. This is more so, bearing in mind the challenge and the development that biofuels and the market share of the raw materials required for their production should increase in global trading. Biofuels will quickly become internationally established as admixture components, which is also a great challenge to automotive manufacturers who have to adapt to this policy when developing their engines.

The world-wide demand for vegetable oils should therefore increase further. The current price development for the most important vegetable oils already dictates pricing in the medium term (Fig. 4). The previous price advantage of palm oil continues to fall. In contrast, rapeseed oil for biodiesel manufacture under European climatic conditions (e.g.: the effects of winter additives) has substantial advantages, making a complete substitution highly unlikely in the short term. Rapeseed oil therefore remains the most important raw material for the production of biodiesel. This is confirmed by this year's biodiesel sales projections and the use of rapeseed oil as a fuel. Growing rapeseed remains therefore interesting (profitable) for the coming sowing season and should be extended to its rotational limits.

General conditions / biofuel quota legislation

The mandatory aim in the EU for minimum volumes of 10% of biofuels on the fuel market by the year 2020 underlines / emphasises the significance of biofuels as a contribution to independence from fossil oil. This target volume represents a challenge on resource policies to mobilise the required raw materials. It is already certain that these cannot be supplied solely from national or European raw material production, but have now become a part of international trading. The creation of certification systems at international level to secure a sustainable production of agricultural raw materials poses currently the most urgent task. Public acceptance of biofuels can only be achieved if biofuels use and imported raw materials come without negative effects on environmental conservation (rainforest clearing).

The general political promotion conditions in Germany have changed substantially in 2006. With the resolution of the federal government to reform the energy tax and federal emission protection ordinance, degressive tax promotion of biofuels will be supplemented with a regulatory promotion policy by the year 2012. The latter stipulates that companies marketing fuels at duty-free level must fulfil specific and rising minimum volumes of biofuels on the market as a part of the so-called quota obligations (Fig. 5).

This promises to provide good sales opportunities particularly for biodiesel, since an assumed further rise in the demand for diesel may increase the use of biodiesel as an admixture component in diesel fuel to fulfil the quota obligations of 8% by volume by the year 2015.

The promotion of biodiesel and vegetable oil under the biofuel quota act is conditional on proof of fulfilment of the required standard in compliance with the European standard for biodiesel EN 14214 and the national standard for vegetable oil E DIN 51605. This means, if biodiesel or vegetable oil does not fulfil the quality parameters at the time of tax-relevant "distribution" (tax source), i.e. from duty-free stock, - although these are of restricted extent and as contained in the executive ordinance of the energy tax act, (Fig. 6), - an act of tax evasion has been committed which is sanctioned under the duty ordinance. In contrast to biodiesel quality assurance at public filling stations under the 10th emission ordinance, this is not just a misdemeanour. "Free" import of biodiesel or vegetable oil without tax registration, as apparently many haulage companies believed possible, represents an equivalent act with the possibility of substantial repayments and which can be pursued as a crime.

The general political framework with regards to promoting biofuels and also the rising requirements from emission laws and thereby on engine technology forces the biodiesel and vegetable oil industries to encounter the "quality pressures" with stronger contribution / participation in research and development. These arguments also underline the generally positive market projections for raw material producers. However, it remains clear to all participants that the development of biodiesel quality needs to be oriented towards the current tightening emission laws and thus directed towards engine technology requirements.

Conclusion and forecast

Competition for the rawmaterial rapeseed oil is expected to increase in Germany and the EU as a result of the changed general tax conditions, the existing dependency on the price developments for crude oil and sharply increased and further anticipated rise in biodiesel capacity. However, sales of biodiesel on the pure fuel market are not in line with the rise in capacities (is not following the increased capacities). The pressure on margins at this processing stage has increased substantially. The biodiesel industry is increasingly facing the same dilemma as the European mineral oil corporations – mineral oil profits are made at the borehole and not through sales at filling stations. Great expectations are therefore placed in the development of an internal European market for biofuels. Politicians must finally address this issue and create a suitable framework to in particular provide German biodiesel manufacturers with the timely possibility to sell to all member states of the European Union.

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Fig. 1: Biodiesel production capacity in Germany (in tonnes)

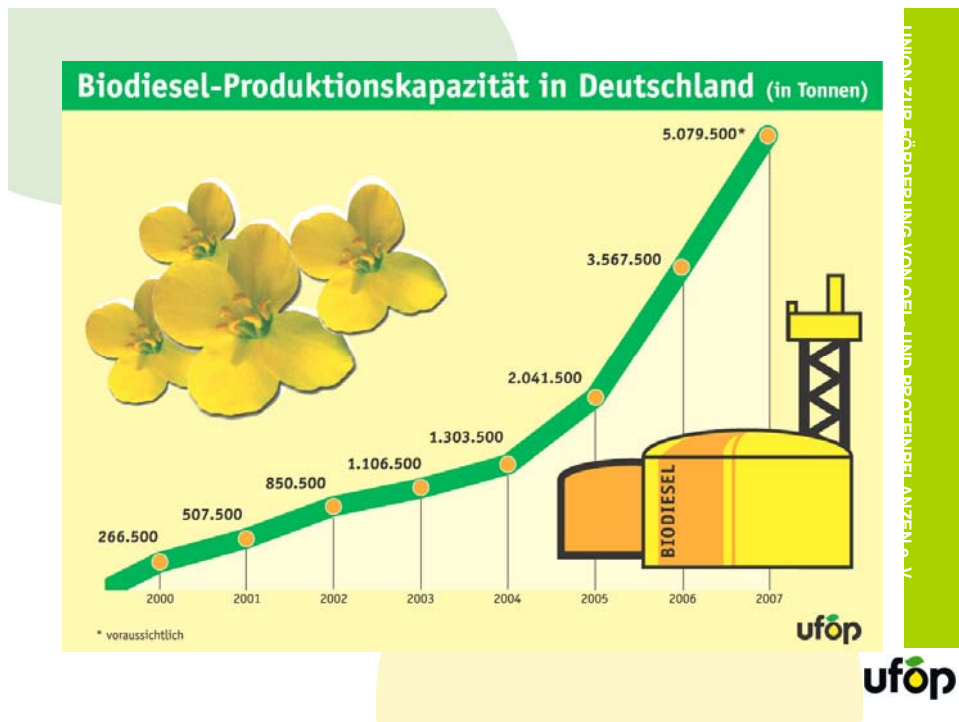


Fig. 2: Biofuel sales 2006 (in 1000 t)

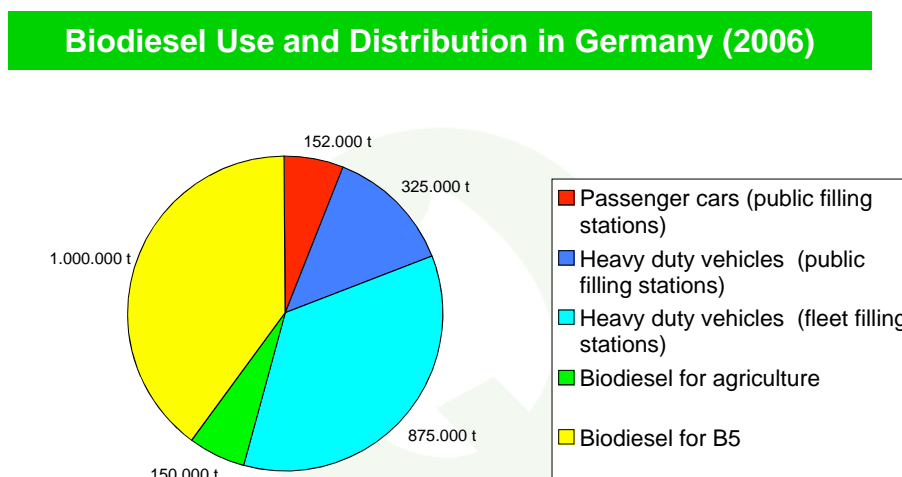


Fig. 3: Biodiesel sales 2007 – Projections

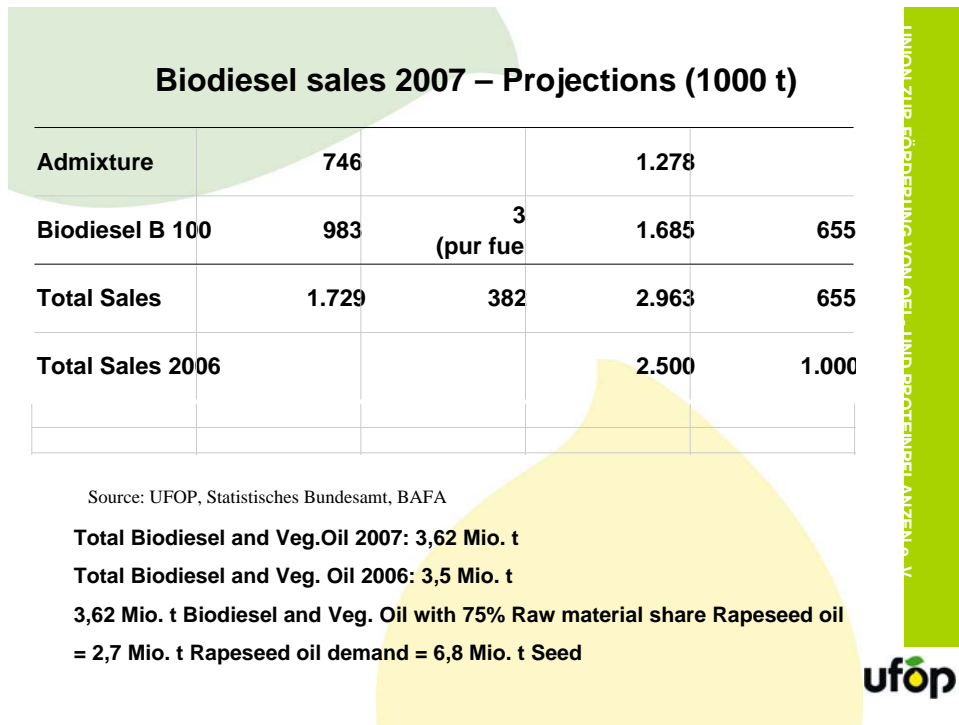
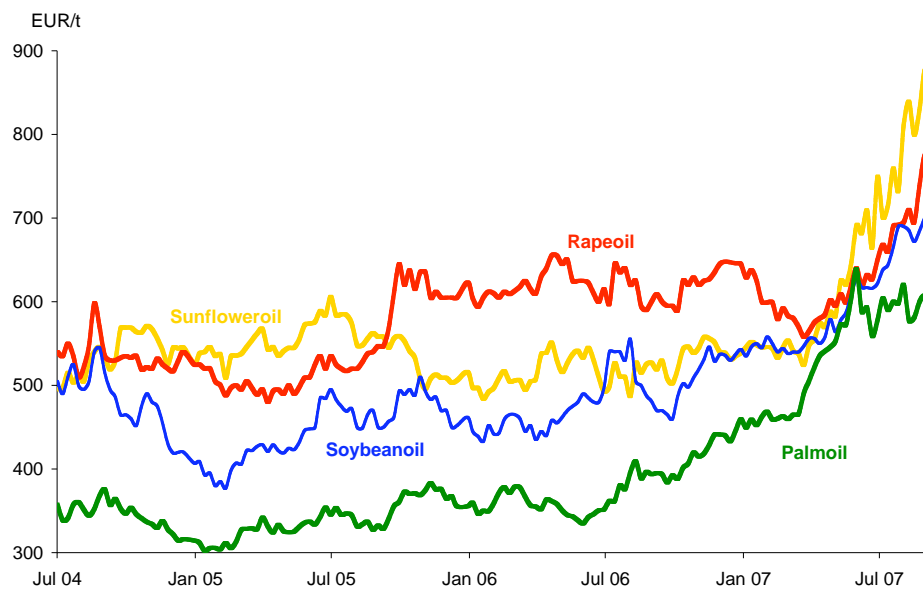


Fig. 4: Vegetable oil prices in EUR/t



Source: ZMP, Bonn

Fig. 5: Biofuel quotas from 2007

Quotas for Biofuels since 01/2007

Year	Total Quota	Diesel-Quota	Gazoline-Quota
2007	-	4,4%	1,2%
2008	-		2,0%
2009	6,25%	„Sub-Quota“	2,8%
2010	6,75%	valid also for	3,6%
2011	7,00%	the following years	
2012	7,25%		„Sub-Quota“
2013	7,50%		valid also for
2014	7,75%		the following years
2015	8,00%		

Full Taxation on Biofuels as admixture/ Quota Commitment:
47 Cent/l (Diesel) and 65 Cent/l (Gazoline); Sanction 60 and 90 Cent/l




Fig. 6: Proof of compliance with the standards

Proof of the Compliance with the Standard

	Standard	Parameter
FAME/Biodiesel	DIN EN 14214 (November 2003)	Density at 15 °C
		S-content
		Water content
		Mono-
		Di-
		Tri-
		Free-Glyceride
		Alkaline-
		Earthalkaline-
		Phosphorous-content
Vegetable Oil	DIN V 51605 (July 2006)	Iodine-No.
		CFPP
		Density at 15 °C
		S-content
		Water-content
		Acid Number
		Phosphorous -content
		Sum of Magnesium/Calcium -content
Bioethanol	DIN EN 15376	Jodzahl
		Ethanol-content

Arbeitsgemeinschaft Qualitätsmanagement Biodiesel e.V.

Source: DVO, BGBL January 2007

