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Presentation:

Policy initiative schemes and benefits of biofuel promotion in Germany

- Current Status of Legislation and Production

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Introduction

The current status of biodiesel production in the European Union as described in this chapter represents political measures with the fundamental objective of stepwise achieving full utilization of renewable energy sources (see **Table X.1**). With these policies, the EU is pursuing a strategy directed towards utilizing renewable energy for

- Combating climate change,
- Reducing local environmental loads,
- Creating jobs and income in an EU increasing to 25 member countries,
- Contributing towards a secure supply of energy.

In order to achieve these objectives, the following timeline was embodied in EU law:

1997 – White Book COM (97)599: Energy for the Future: Renewable Sources of Energy.

2000 – Green Paper COM (2000)769: Towards a European Strategy for the Security of Energy Supply.

2001 – Directive 2001/77/EC on the Promotion of Electricity Produced from Renewable Energy Sources in the Internal Electricity Market.

2002 – Directive 2002/91/EC on the Energy Performance of Buildings.

2003 – Directive 2003/30/EC on the Promotion of the Use of Biofuels or Other Renewable Fuels for Transport.

2003 – Directive 2003/96/EC Restructuring the Community Framework for the Taxation of Energy Products and Electricity.

In its white book, the EU and its member countries set the goal of increasing the production and use of renewable energy to a minimum of 12% of the total domestic energy consumption by the year 2010. The amounts of green power and biofuels should be 22 % and 5.75 %, respectively.

It should not be overlooked that these ambitious goals were not approved without reservations by representatives of economical and political interests. The different conversion into national legislation by the individual member countries reflects their different priorities regarding energy and climate policy. This is the result of intensive political discussions in the individual countries and at EU level in which the variability provided in the EU directives is utilized in very different fashions relative to the individual climate protection responsibilities. The strategies of the member countries for promoting renewable energy therefore differ greatly and can be exemplified by the different tax advantages for biofuels described below. Therefore, a well-balanced consensus of all political and economical parties is needed in order to achieve the strategic objectives without conflicts and without distorting competition. It is already recognizable that the speed at which the directives will be applied varies greatly and possibly the desired proportions of biofuels according to the EU directive may not be attained. The German example shows that technical problems concerning the commercialization of biodiesel and other biofuels (ethanol and sundiesel) can only be solved within the existing economical and political conditions.

Table X.1. Renewable energy in the EU

Current EU targets and the feasibility					
Will the White Paper targets be achieved?					
Type of energy	1995 Eurostat	2001 Eurostat	AGR* 1995-2001	White Paper targets 2010	AGR* needed 2001-2010
1. Wind	2.5 GW	17.2 GW	37.9%	40 GW	9.8 %
2. Hydro	87.1 GW	91.7 GW	0.9 %	100 GW	1.0 %
3. Photovoltaics	0.04 GWp	0.26 GWp	36.6 %	3 GWp	31.2 %
4. Biomass	44.8 Mtoe	56.5 Mtoe	3.6 %	135 Mtoe	10.3 %
5. Geothermal	2.72 Mtoe	3.43 Mtoe	3.9 %	5.2 Mtoe	4.7 %
6. Solar Thermal	6.5 Mio m ²	11.4 Mio m ²	9.8 %	100 Mio m ²	27.2 %

* Annual Growth Rate

Directive Promoting Biofuels

On May 28, 2003, the European directive for promoting biofuels went into effect. The centerpiece of this directive is an action plan that prescribes minimum proportions of biofuels for each member country based on its share of the fuels market. The action plan calls for a biofuels share of 2% of overall fuel consumption in the EU beginning in 2005. This share is to increase stepwise to 5.75% by 2010 (see **Table X.2**).

Table X.2. Biofuels action plan of the EU Commission.

Bio Fuel Production in the EU			
Year/Minimum Share (each 1998)	Gasoline-Consumption	Diesel-Consumption	Total
2005 / 2,00 %	2341	2532	4873
2006 / 2,75 %	3219	3482	6701
2007 / 3,50 %	4096	4431	8527
2008 / 4,25 %	4974	5381	10355
2009 / 5,00 %	5852	6331	12183
2010 / 5,75 %	6730	7280	14010

All notes in 1000 metric tons

Based on fuel consumption 1998

References: EU-Commission KOM (2001) 547 fin.

Depending on how total fuel consumption develops, approximately 14-16 million metric tons of biofuels should be produced in the EU by 2010. Biodiesel would account for about 7.5 (EU 15) million metric tons. The new memberstates are not included, because reliable statistics of the dieselconsumption are not yet available. In terms of absolute biofuel quantities, satisfying these goals is an enormous challenge for the individual member states. Therefore, it was not surprising that these goals, which originally were suggested as obligatory by the EU Commission, were the subject of an intensive discussion between the EU Parliament, Council of Ministers and the EU Commission. The resulting compromise was that the goals are not obligatory but instead are indicated objectives. However, the Commission reserved the right to prescribe the goal for an individual member country if the country does not make any efforts to meet a goal.

Furthermore, the realization of the promoting directive calls for reporting responsibilities of the Commission to the EU Parliament and therefore from member countries to the Commission. Subjects of the reporting responsibilities are, among others, the environmental efficiency of the individual biofuels, their contributions to preserving natural resources and climate protection as well as energy independence. It needs to be emphasized here that the promoting directive on biofuels contains an empowerment for the member countries to tailor the mineral oil tax preference based on comparative life-cycle assessments (LCA) depending on the individual biofuel. An intense discussion on LCAs has therefore begun in Germany and also on a European level.

The biofuels industry in the growing EU therefore must adjust to the increasing transparency of the sector from production of the feedstock to the value-added biofuel. Therefore, the Union for the Promotion of Oil and Protein Plants (UFOP) participated in financing and conducting an assessment of LCAs based on globally available studies. This work was commissioned by the “Technical Association for Combustion Engines” (*Fachvereinigung Verbrennungskraftmaschinen; FVV*), an institution founded by the German automotive industry for promoting research on problems transcending those of individual companies. In 2003, the UFOP commissioned the Institute for Energy and Environmental Research (ifeu) with updating the LCA of rapeseed oil methyl ester and opened up to political discussion the contribution of the biodiesel chain to climate protection and preservation of resources. Although the future tax frameworks will be largely determined by comparison of LCAs, it must be noted critically that there is no concerted strategy on EU level between the biodiesel or biofuels industry and their trade associations. On the other hand, this subject is being dealt with intensively by the automotive industry. The background is to accelerate the strategic development of new fuels and engine technologies in order to achieve increasingly CO₂-neutral mobility satisfying the self-imposed obligation of the European Association of the Automobile Industry to reduce the CO₂ emissions to 140 g/km by 2008.

Another important strengthening aspect for the biodiesel industry is the production of biodiesel as prescribed in the EU promoting directive according to the standard EN 14214 which went into effect in November 2003. According to the promoting directive, the member

countries are obligated to monitor the biodiesel quality resp. the permitted amounts of biofuels in gasoline (petrol) or diesel fuel at filling stations. The new European standard for conventional diesel fuel, EN 590, now permits the possibility of blending a maximum of 5% biodiesel on the basis of the European standard. The promoting directive calls for special labeling of the fuel at blend levels greater than 5% biodiesel. The new member countries must meet these quality requirements after joining the EU on May 1, 2004.

Energy Tax Directive

After nearly 12 years of intensive coordination between the member countries, the energy tax directive went into effect on October 31, 2003. The energy tax directive is the legal basis for national legislation and regulations concerning tax advantages for biofuels. Article 16 of this directive empowers the member countries to apply tax exemptions or reduced tax rates to biofuels. The energy tax directive specifically limits the tax exemption to the biomass portion of the biofuel. This limitation is significant for bio-ethanol used for producing ethyl *tert.*-butylether (ETBE) but also for biodiesel, in the production of which methanol of fossil origin is used. The energy tax directive requires that the tax reduction or exemption must be examined regarding overcompensation taking the corresponding development of raw materials into account and, if needed, be changed. The tax exemption or reduction may only be valid for 6 years, although this period can be extended. Furthermore, the member countries have to report to the EU Commission the tax reductions or exemptions by December 31, 2004, and from then on every 12 months.

In summary, the promoting and energy tax directives of the EU grant the member countries significant variability for creating tax advantages for biofuels as prerequisite for meeting the goals of the action plan, but also require extensive reporting, amounting to constant monitoring, from cultivation of the raw material and production up to the final use of the biofuels in their corresponding markets.

Conversion into National Legislation

The possibilities for conversion into national legislation described above currently vary greatly among the EU member countries. In some member countries tax advantages have been created

and are based on legislation. In other countries a parliamentary discussion has begun and legislation is pending while in some countries no government or parliamentary initiatives for creating a tax advantage for biofuels are recognizable.

In Germany, a change in the law regarding the tax advantage for biofuels went into effect on January 1, 2004. Formally, no tax exemption for biofuels is granted. Instead a tax rate of 0 is introduced without limiting the quantity of biofuels receiving this advantage. The tax advantage is examined annually, for the first time by April 30, 2005, by means of a report from the government to the federal parliament. The government resp. the finance ministry can reserve the right to carry out an adjustment based on this report. Especially the question of overcompensation is examined but also if the production of biofuels contributes to energy security based on the feedstocks produced in Germany and contributes to the quantity goal or if the tax exemption leads to significant imports of biofuels. In order to satisfy the reporting requirement, the law on energy statistics was extended by introducing a reporting requiring biofuel producers beginning in 2004. Thus fuel producers for the most recent calendar year have to retroactively report to the German Federal Statistics Agency (*Statistisches Bundesamt*) the quantity of fuel produced, classified according to feedstock and marketing routes. Imports and exports are also covered.

Below are listed the most important changes to the mineral oil tax act and the mineral oil tax implementing ordinance.

Amendments to mineral oil tax act

“biofuel = mineral oil”

Fatty acid methyl esters (biodiesel) appear in the list of mineral oils as further taxable items. In line with the energy tax directive, a further amendment to the law in relation to the definition of biofuels specifies that the latter are to be treated as mineral oils if the corresponding products (rapeseed oil, biodiesel, bioethanol, biogas), even although they are not, chemically speaking, hydrocarbons like mineral oils, are destined to be used as fuel. The exception to this is biomass to be used for heating purposes such as, for example, rapeseed

oil/biodiesel used for the operation of oil heaters or block-type thermal power stations. In other words, the intended use determines how the product is classified for tax purposes.

The changes with respect to tax relief for biofuels for transport and heating purposes provide for preferential tax treatment to be granted up to 31 December 2009. This period may be extended in line with the energy tax directive. However, the tax relief is limited to the part of the biofuel that can be proven to be made up of biomass. The specification that, to the extent that they are manufactured by esterification, fatty acid methyl esters (biodiesel), are also to be regarded as biofuels is evidence that account has been taken of the fact that while the process uses methanol made from fossil raw materials, it yields at the same time an equivalent amount of biogenic glycerine. While a full exemption of biofuels from mineral oil tax does not require the approval of the EU Commission, paragraph 3, section 2a makes it clear that the tax relief must not lead to overcompensation. Thus the level of the tax break can be adjusted to developments on the crude oil market and the prices of biomass and fuel. The amended legislation requires the situation to be monitored in a report to be submitted each year to the Bundestag. This report is to include consideration of the effects on climate and environmental protection, the conservation of natural resources, the external costs of the various fuels and progress in achieving the targets laid down in the EU directive in terms of the contribution of biofuels to energy supply. The first report is to be submitted to the Bundestag on 31 March 2005.

Bioethanol

The legislation specifies that only undenatured bioethanol will qualify for tax relief, providing it is ethyl alcohol with a minimum alcohol content of 99 % vol. The reason given is that the denaturants contained in denatured bioethanol are not generally biogenic and it is extremely difficult if not impossible to establish how much is contained in denatured bioethanol.

The problem of demarcation in relation to quality assurance and market protection is resolved in the case of bioethanol by the fact that tax relief is limited to undenatured Bioethanol and the Federal Government must apply to the EU Commission for appropriate measures to be taken if the German market for biofuels for transport and heating purposes is disrupted by imports

from non EU countries. In the case of imported bioethanol, the legislation also calls for monitoring in the country of manufacture. The relevant authority in the country of manufacture is required to issue a certificate proving that the ethanol is manufactured from biomass.

The tax break is administered in the form of a remission or refund made on application by the taxpayer. A tax warehouse has to be established. Those entitled to apply include biofuel manufacturers, mineral oil manufacturers (addition of biofuels to conventional fuels), trading companies operating tax warehouses.

Notification requirements

In order to qualify for tax relief, biofuel manufacturers and/or warehouse keepers storing biofuel for transport or heating purposes are required to register their activity with the appropriate main customs office by 31 January 2004. This obligation applies to all biofuel manufacturers, including the operators of small-scale pressing plants (rapeseed oil as fuel). The submission of an informal notification provides the biofuel manufacturer with assurance that a so-called manufacturer's licence will be valid until 30 April 2004. The customs office, for its part, is required to confirm receipt of the notification and to inform the applicants that an application to set up a tax warehouse must be submitted by 30 April. It can be determined in individual cases whether it is sufficient to set up gauged extraction points since the risk of tax loss is known to be low. It appears that red tape is to be kept to a minimum for the operators of small plants.

More complex requirements apply in the case of bioethanol in order to prove that only undenatured bioethanol with a minimum 99 % vol. is blended with petrol. A blend containing tax-exempt spirits is permissible only if the operation is licensed by the main customs office both as a mineral oil manufacturing plant and a tax warehouse for spirits. The former requirement is already fulfilled by the major mineral oil companies – where bioethanol is to be used, these likewise become operators of tax warehouses for spirits.

Changes to the mineral oil tax implementing ordinance

Proving the nature of the biomass

Granting of tax relief is also linked to proof of the nature of the biomass in the biofuel in question. The implementing ordinance specifies that a general declaration is not sufficient on its own; agreement has to be reached in individual cases between the applicant and customs office. According to information from the Federal Finance Ministry, the nature of the biomass is established in practice in the case of plant oils or fatty acid methyl esters from the product analysis; hence records kept by the company regarding the quantities manufactured from the respective plant-based raw materials can be regarded as sufficient proof. Where biodiesel is blended with diesel fuel in a mineral oil warehouse, the warehouse keeper must, as a condition of the tax relief, provide proof both of the nature of the biomass in the biofuel added to the mixture and how much has been added. According to the Finance Ministry, a declaration from the manufacturer of the biodiesel is sufficient to establish the nature of the biomass.

Where bioethanol is used, the bioethanol must, as has already been stated, be undenatured and have a minimum alcohol content of 99% vol.

While establishing proof in the case of domestically produced bioethanol is relatively straightforward, the implementing ordinance requires that the production of imported bioethanol is subject to monitoring in the country of manufacture. The appropriate authority in the country of manufacture must issue a certificate establishing the nature of the biomass used in the imported bioethanol. In principle the Ministry recommends that to hedge against tax risks in the case of bought-in bioethanol, the nature of the biofuel used for transport or heating is certified in writing. Where insufficient proof is furnished, the applicant for tax relief will be assessed for tax. This may be a mineral oil trading company operating a tax warehouse for the manufacture of biofuel/mineral oil fuel mixtures, or the mineral oil industry and/or biofuel manufacturers intending to market fuel mixtures. In individual cases applicants are recommended as a matter of principle to consult the appropriate main customs office.

Fuel quality

Notwithstanding the tax possibilities involved in the manufacture of fuel/biofuel mixtures, the quality and/or quality assurance of the product is an important issue. The European standards for diesel fuel EN 590 and for petrol EN 228 permit the addition of a maximum 5 % biodiesel or bioethanol. While other mixtures containing a high proportion of biofuels are possible in tax terms, these mixtures no longer conform to either of these fuel standards and therefore have to be classified separately in accordance with the EU directive on the promotion of the use of biofuels and the national fuel quality and classification ordinance (10th Federal Immission Protection Ordinance). This aspect is particularly relevant in the case of the use of diesel/biodiesel mixtures with respect to the end customer (product liability), since the original quality of the fuels in question is impossible to determine in a mixture.

Against this background the exemption provided for in the amended implementing ordinance means that practically any mixture can be produced in the warehouse of the end customer without tax implications providing the fuel mixture created is exclusively for the end customer's own use. The German Farmers' Association pressed for this regulation in order to promote the marketing of biodiesel and encourage businesses to convert. The regulation means that a second storage tank can in practice be dispensed with. But it is still necessary when using biodiesel/diesel mixtures to carry out appropriate measures such as cleaning the storage tank and changing over the petrol pumps to dispense fuel containing biodiesel. Nevertheless, it is important to emphasize that biofuels are mineral oils (see above) within the meaning of tax law with the consequence that the mixing of biofuels with fossil fuels (except in the case of the end customer) outside the tax warehouse has tax consequences and will lead to the entire amount being subject to retrospective assessment.

Situation in the EU-memberstates

In **France**, the tax advantage for biodiesel is €33 per 100 liters with a tax rate of €41.69 per 100 liters for conventional diesel fuel. The government annually determines the quantity of biodiesel receiving this advantage. For 2003, this amount was 320,000 metric tons and for 2004 it is 390,000 metric tons. However, the total production capacity for biodiesel is

470,000 metric tons. This surplus capacity results in fuel exports and supply pressure in other countries.

The government of the **United Kingdom** has decided on a tax advantage of €33 per 100 liters for biodiesel without limiting quantity. This tax advantage does not suffice for a market breakthrough, according to the British Association for Biofuels (BAFBO). The developing production capacity is largely concentrated around the use of used frying oils and animal fats, which, however, must be evaluated critically relative to satisfying the quality criteria set forth in EN 14214.

The **Italian** government also determines an annual quantity of tax-exempt biodiesel. For 2003, this amount was 120,000 metric tons.

Like Germany, **Sweden** has exempted biofuels since the beginning of 2004 from the combined CO₂- and energy tax, thereby setting the “mineral oil tax rate” to 0. The tax advantage is financed by tax increases on conventional diesel fuel and power for the manufacturing industry as well as households and the service sector. The tax exemption is €36 per 100 liters.

In **Austria**, too, biodiesel is not subject to the mineral oil tax and without limiting quantity.

The **Dutch** cabinet announced to do its utmost to ensure that biofuels become available from 1 January 2006 and to implement a subsidy scheme to achieve the maintained target value (2% of the energy content for petrol and diesel). In 2005 the government will publish the results of a study, which includes the financial aspects and preparations required. The government’s policy will be evaluated in 2007, and will support the government to determine whether the EU guideline’s indicative target value (5,75% in 2010) can be achieved.

Currently, no satisfactory information is available regarding tax legislation in all EU member countries. By the end of 2004, the member countries must inform the EU Commission about the conversion of the directive into national legislation. The incomplete compilation underscores the still insufficient association structure at the European level. Biodiesel

producers are challenged to join the European Biodiesel Board (EBB) and to supply the corresponding data for the necessary statistics as a contribution to safeguarding their interests. Strengthening of trade associations will be absolutely necessary so that the biodiesel industry can enter into the expected political discussions on national and EU level in a unified fashion.

Capacity and Development of Production

With the background of the promoting and legislative framework described above, biodiesel capacity has increased in an unexpected fashion in the EU and especially in Germany. From 1996 to 2003 with more than 2.2 million tons capacity, biodiesel production capacity in the EU more than quadrupled. Biodiesel production capacity in the EU as of 2004 is depicted in **Figure X.1**. In Germany, 24 companies with a total capacity of 1.1 million metric tons are producing biodiesel. Additional 0,5 Mio. Tons capacity are currently under construction. The capacity will rise at the latest at the end of 2006 up to about 1,6 Mio. metric tons capacity per year. Germany will be the first memberstate fulfilling the EU-promotion directive in the diesel market.

The development of biodiesel sales in Germany since 1991 is shown in **Figure X.2**.

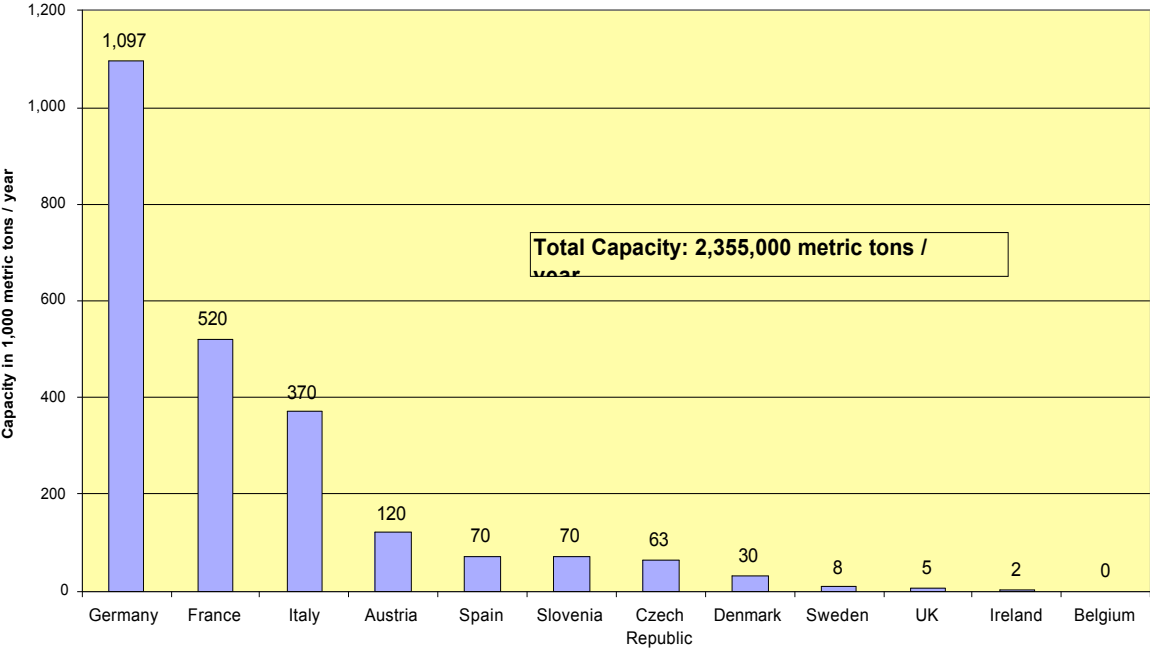


Figure X.1 Biodieselproductioncapacity in the European Union

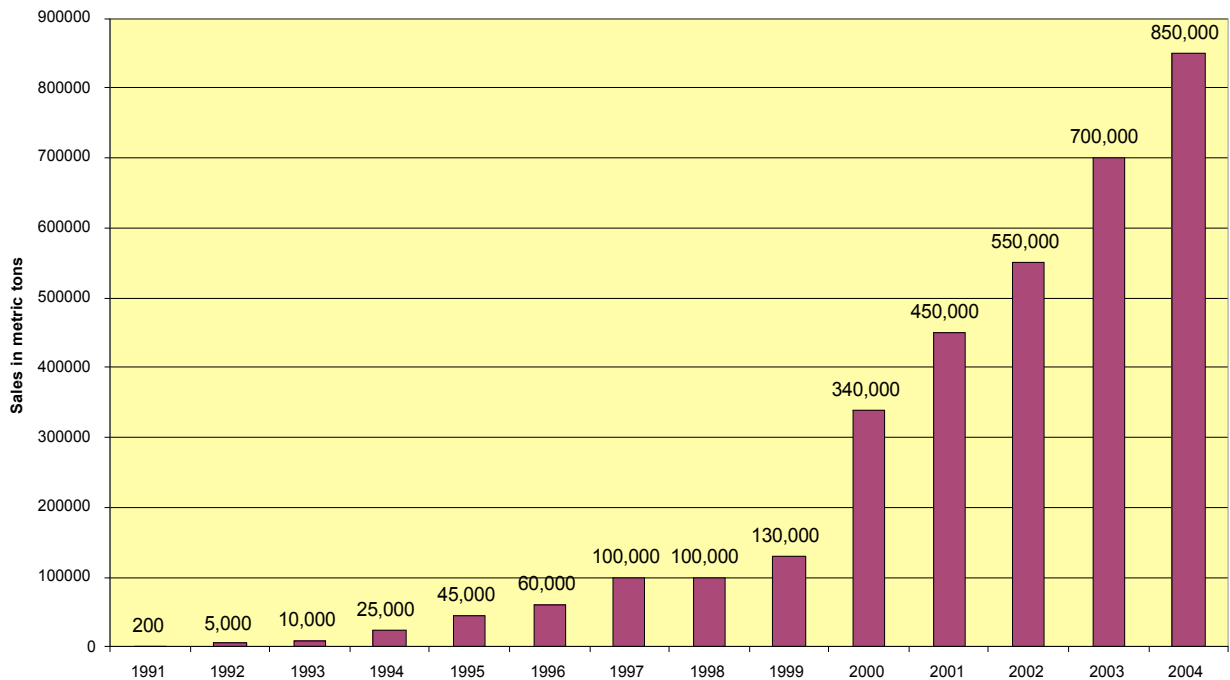


Figure X.2. Development of biodiesel sales in Germany.

In Germany, 90% of the feedstock for biodiesel is rapeseed oil while sunflower oil is also used in southern Europe. The decisive parameter for feedstock use is the minimal quality requirement of the standard EN 14214. Due to biodiesel being mainly marketed as neat fuel in Germany, the automotive industry exerts significant pressure on the biodiesel industry to rigorously meet the requirements in the standard. This pressure will increase through the changed directive effective April 2004 requiring the labeling of fuel quality. Biodiesel is contained in this directive and thus is, like gasoline (petrol) or conventional diesel, as so-called “common commercial fuel” (*handelsüblicher Kraftstoff*), subject to the same unannounced controls by regulatory agencies. Serious deviations can lead to the temporary closure of the biodiesel pump. The service station operator is liable for the product. In Germany, the “Working Group for Quality Management of Biodiesel” (*Arbeitsgemeinschaft Qualitätsmanagement Biodiesel e.V.; AGQM*), in order to avoid liability claims from service stations directed towards biodiesel distributors and producers, will extend the contract conditions concerning additization with an antioxidant. For creating an “aging reserve” in light of the very different turnover at service stations or even self-use tanks, this quality assurance

measure is absolutely necessary. This was shown by an extensive check conducted in cooperation with DaimlerChrysler AG and Volkswagen AG at 170 service stations. The AGQM (www.agqm-biodiesel.de) regularly carries out field analyses and producer checks, quality is constantly monitored, and the results enter into updates of the quality assurance concept and the information sheets of the AGQM for transporting and storing biodiesel.

A more intensive international cooperation and sharing of experience is urgently needed also in the area of quality assurance. A first step would be the extension of round-robin tests conducted by biodiesel producers so far only in Germany. Subsequent workshops for training laboratory personnel and quality assurance specialists have been successful.