

Recent Developments In The German Biodiesel Market And Implications For Investment Projects

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ABSTRACT

Due to the fiscal support granted by the governments of the EU member states biodiesel has attracted investor interest, which lead to extension of production capacities and higher production levels. However biodiesel, due to the high production cost compared with regular fuel biodiesel, is not competitive without fiscal advantages. The paper analyzes recent developments in the German biodiesel market, as this is the most advanced market within the EU in terms of biodiesel consumption and sale of the product in a pure state (B100). The implications on younger biodiesel industries such as in Eastern Europe are significant, as similar developments can take place also for these. Moreover the German case has high learning value for both regulators and investors at firm level.

KEY WORDS: *biodiesel, investments, Germany, production capacity, returns*

1. INTRODUCTION

The increase in the number of cars and in the consumption of fuels for transport, the lower oil reserves with an impact on covering future fuel needs for transport, the high level of damaging gases on the environment, the high dependency on oil imports, have contributed to the search for innovative solutions for substituting regular fuels in the EU. Presently there is a general consensus within EU member states regarding the need to identify and promote alternative fuels for transport.

Biodiesel is, due to its properties, a renewable fuel with a high potential to replace diesel. Its renewable character comes mainly from the utilization of biomass as main raw material in the production process. Biodiesel has also advantages regarding the effect on the environment, as it has lower emissions than diesel. This contributes to the ecological objectives of the EU. Last, but not least, biodiesel can be commercialized at regular fuel pumps, which reduces the need for additional investments in the distribution network. Following these advantages EU has started in 2003 [3] a promotion campaign for biodiesel by setting clear targets for biodiesel consumption in the transport sector and by enabling member states to give various fiscal and regulatory incentives to attract the interest of individual investors.

EU member states have translated these objectives into promotion measures such as: exemption from excise duties for biodiesel and compulsory blending of diesel with biodiesel, which is currently capped at 7% content for biodiesel [2]. While the exemption from excise duties ensures the price competitiveness of biodiesel in the fuel market, compulsory blending creates a distribution segment for biodiesel. These measures have led to the implementation of investment projects in biodiesel and a surge in production capacities in countries such as Germany and France. Currently the distribution of biodiesel in Germany knows both the commercialization through the compulsory mixing of regular diesel with biodiesel, as well as the sale of biodiesel in a pure state, which is called B100 (100% content).

However a major disadvantage of biodiesel is the superior production cost compared with regular fuels. This disadvantage is mainly caused by the widespread utilization of oilseeds as primary input in the production process. The high acquisition price for oilseeds, as well as the lack of viable production alternatives for biodiesel mass production, are the main causes for the high production cost of biodiesel. In this respect the recent success recorded by the biodiesel industry in the EU is a direct consequence of the governmental support offered to investors to maintain biodiesel production profitable. The withdrawal or the reduction of government support (e.g. introduction of excise duties) could potentially affect the general competitiveness of biodiesel in the fuel market. Such a scenario could potentially trigger a ceasing of new investment project or even jeopardize the long term survival of existing ones.

An additional disadvantage of the product is the high dependency on the evolution of global oil markets, as a decrease in the price of oil usually translates into lower prices for regular diesel and a further erosion of the biodiesel competitiveness. Such a development is even more aggravated by the fact that biodiesel is a new industry and the perception of the product at consumer level is still low. Based on this the main differentiating factor between products in the fuel market is the selling price, as other advantages such as lower emission levels from biodiesel play only a secondary role in consumer minds.

Despite the overall positive attitude of the EU towards biofuels, a trend towards at least reducing the support granted to biodiesel producers can be observed. This trend corroborated with higher prices for oilseeds and lower diesel prices are main risks to which investors in biodiesel are exposed.

The above aspects represent the main drivers for analyzing the German biodiesel market, as this is both the most developed market within the EU and provides also extensive data for analysis. Countries such as those from Eastern Europe are in an early development stage for biodiesel and grant only limited insight for analysis due to scarcity of data.

Moreover the learnings from the German market can be applied also to younger biodiesel industries in their path towards maturity.

2. DEVELOPMENT OF GERMAN BIODIESEL DURING 2002-2007

The biodiesel market in Germany has known a rapid and sustainable development in the time frame 2002-2007. Germany was also one of the few locations in Europe to introduce commercialization of biodiesel at fuel pumps in a pure form B100, which represented an additional incentive for investors as it created a new distribution segment and a diversification from the distribution of biodiesel as a blending ingredient with diesel. Moreover the indirect distribution through mixing creates a high dependency on large diesel producers, as the blending is usually carried out at their production facilities and then forwarded to fuel stations. In this regard the indirect distribution does not allow for the sustainable development of the biodiesel industry, as the perception of the product in consumer mind is low. From this perspective Germany offered an appropriate setting for biodiesel production as it enabled also the direct distribution of biodiesel at fuel pumps.

Based on this Germany recorded the highest development of consumption at EU level, with a compound average growth rate (CAGR) of approximately 128 % (Figure 1)

This rise was possible due to the strategic objectives set by Germany to reduce the high dependency of the German economy on oil imports.

In the year 2004 the excise for biodiesel was completely removed and allowed a high price competitiveness of biodiesel compared with diesel. Despite the strong growth recorded in the period of analysis, a certain slowdown towards the end can be observed. In 2007 biodiesel consumption recorded only a modest rise of approximately 9% compared with the previous year and this growth rate is at its lowest over the average for the whole period (128%). In order to determine the exact causes for this slowdown the commercialization price of biodiesel on the German market was further analysed. Due to the high development of this market, the price for biodiesel is available for analysis [6] and is presented in Figure 2.

The analysis includes also the development of the diesel price as the main substitution product of biodiesel. The consumer has the option to choose between diesel and biodiesel, as the products cover the same energy needs for transportation. Based on the results presented in Figure 2 a certain price advantage is noticed for biodiesel, but this advantage drops towards the end of the period. However the price difference between the two products is not a consequence of the lower production price for biodiesel than for diesel. The price advantage for biodiesel was only possible through the excise tax exemption granted by the German state to biodiesel producers.

In order to confirm this hypothesis Figure 2 includes also the price development of biodiesel in case of full taxation. The computation is based on a level of excise duties of 45 EURcents/liter, which is the value applied for diesel and a VAT value of 16% until 2006 and of 19% from 2007 onwards.

In case of full taxation the price advantage of biodiesel disappears. The price of biodiesel, under such a scenario, is superior, based on the average of the values in the period, with approximately 40% and 30% to the price of biodiesel and to regular diesel. This confirms the initial hypothesis that the competitiveness of biodiesel was possible only due to tax exemptions granted by the German state. The reintroduction of the excise tax generates a higher price for biodiesel than for diesel and completely eliminates the price advantage offered to the final consumer for the purchase of biodiesel.

3. RECENT DEVELOPMENT OF GERMAN BIODIESEL DURING 2008-2009

The recent development of the German biodiesel market indicates a repositioning trend of the biodiesel competitive landscape and a higher consolidation at producer level. These modifications of the biodiesel industry are a consequence of the high level of sensitivity of biodiesel production to momentum political decisions. Such political decisions are based on unfavorable economic factors (e.g. lower governmental budget income) or non-economic factors (e.g. negative perception of biodiesel with regards to the competitiveness with food and non-food industries for oilseeds or negative results linked to the ecological effects of biodiesel).

At the same time the considerable drop in biodiesel investments in 2009 indicates a tendency towards reduction of production capacities and adaptation to the real biodiesel demand. This evolution also highlights the beginning of a consolidation wave in the sense that larger producers with a foothold in more regions will dominate the competitive landscape, while small sized factories will potentially leave the market. For instance in Germany in 2009, there were approximately 45 producers with an average annual production capacity of 109 thousand tones. From these, based on data provided by UFOP [6], over 24 have

a production capacity below the average, while 14 have an annual production capacity under 50 thousand tones.

Figures 3 and 4 give the real distribution of production capacities based on the number and on the size of each producer, and a hypothetical distribution, in case of an annual utilization rate of production capacities above 90% (compared with the real utilization of approximately 52% in 2008).

For the computation in Figure 4 an average annual production of biodiesel of 2,855 thousand tones over the period 2007-2009 was used.

The decision to use an average value for production instead of the actual production for 2009 was taken to avoid temporary negative effects of the EU economic recession on the biodiesel industry. The hypothetical distribution leads to a lower number of competitors to 14 and a substantial rise in the average annual production capacity of biodiesel to 227 thousand tones. On the other hand the average capacity records a double value compared with the real competitive situation also because of the contribution of the largest German biodiesel producer with an annual capacity of 580 thousand tones. Recalculating the average without the leading producer generates a value of 162 thousand tones. Based on this working hypothesis, the consolidation of the German industry means the market exit of small producers (annual production capacities below 100 thousand tones) and the reduction of competitors from 45 to 14. Following the consolidation the market share of each producer rises considerably and the capacity utilization rate reaches 90%. Another advantage of consolidation is the higher bargaining power of producers in the negotiation process with suppliers of raw materials, but also further economies of scale from higher production rates. In addition the risk of monopoly or concentration on the German market is low, as the first 3 producers, even in the case of small producers exiting the market, hold a cumulated market share of approximately 36%.

Figure 5 presents the negative development of the industry based on the share held by biodiesel in the total consumption of diesel and the lower utilization rates of biodiesel production capacities.

The disconnection between the actual demand for biodiesel and the production capacities, corroborated with the lower prices for oil in the global markets, have determined the decrease in the market share of biodiesel in the diesel market from 10.3% in 2007 to approximately 8.0% in 2009.

In order to determine the exact causes for the decline the recent development of sales for biodiesel was analyzed. This analysis is based on the main types of biodiesel, which are currently commercialized in Germany (B100 and in blending form).

The results, presented in Figure 6, indicate the strong decrease of the B100 distribution segment. Sales of pure biodiesel recorded in 2009 a drop by approximately 77.8% compared with the previous year. The only type with a significant consumption growth is biodiesel sold as an ingredient in the final product with diesel. This positive development was generated by the government decision to increase the mixing share of biodiesel from 5% to 7% [2]. However the growth of 41% for biodiesel as a blending product could just partially compensate the decrease of the B100 segment.

Two effects cause the negative evolution of the German B100 market:

- the lower prices for oil on global markets and for diesel as a product derived from oil
- the rise in the excise duty from 14 EUR cents/liter in 2008 to 18 EUR cents/liter in 2009

The impact of both effects on the biodiesel price is shown in Table 1. Based on this between the fourth semester of 2008 and the first semester of 2009 a reduction occurs in the production cost difference

between diesel and biodiesel from -9.4 EURcents/liter to -8.1EURcents/liter. Although the development is positive for biodiesel producers, this comes from a temporary drop in oilseed prices, especially for vegetable oils during the recession period.

From the perspective of the fiscal incentives in the period of analysis the excise duty tax is increased from 14.9 EUR cents/liter to 18.4 EUR cents/liter, which represents an additional pressure on biodiesel prices in case of a recovery of oilseed prices.

It can be inferred, based on the analysis carried out so far, that the German state is shifting its biodiesel promotion strategy from fiscal incentives to higher mandatory blending rates of biodiesel with regular diesel. This strategy offers short term advantages to biodiesel producers, as they are able to distribute higher volumes. However from a sustainable long term development the indirect distribution creates a high dependency on large oil producers and a low perception of the biodiesel product at consumer level.

The consolidation wave in Germany is further supported by the national plans to introduce a product certification system for biodiesel, which will eliminate producers who can not certify the quality of biodiesel along the whole value chain of production. Based on this fiscal advantages are offered only to those producers who can certify that they use only raw material from environmentally friendly sources (e.g. the oilseed harvest does not come from areas under national protection).

4. CONCLUSIONS

Recent evolutions of fiscal and legislative initiatives in the developed biodiesel markets indicate that the biodiesel industry will have to identify and implement own solutions for increasing, or at least maintaining, the competitiveness of biodiesel. The analysis carried out for Germany in the paper clearly indicated that, under the current environment and through a reduction in government support, biodiesel becomes uncompetitive. This reduces the profitability of investment projects and can even jeopardize their long term survival. On the other hand the German market is currently undergoing a consolidation wave, which implies the exit of small players and maintaining just large scaled and broader regionally focused biodiesel producers. The impact of such a development on the overall industry and on investment projects is positive, as producers grow their bargaining power with suppliers and also with large oil companies, in case of indirect distribution. In addition through increased financial power manufacturers would be able to better cope with negative events (e.g. drop in global oil prices) and focus also on identifying value driving managerial solutions.

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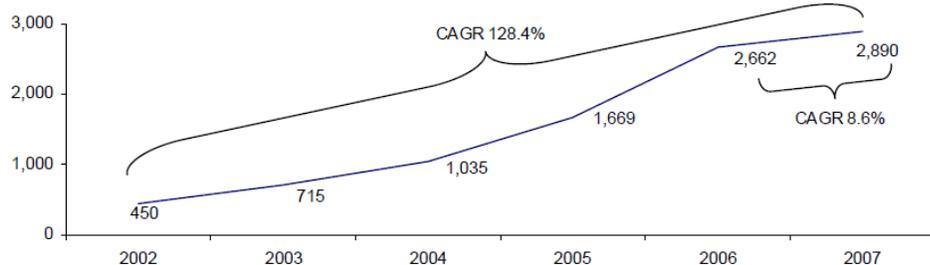


Figure 1: Biodiesel consumption in Germany (in thousand tones)

Source: European Biodiesel Board [4]

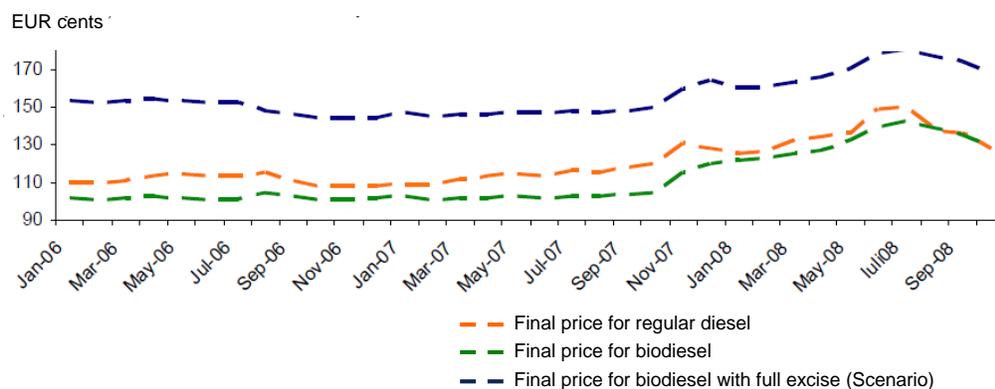


Figure 2: Development of prices for biodiesel and diesel (EURcents/liter)

Source: UFOP[6] and own estimations

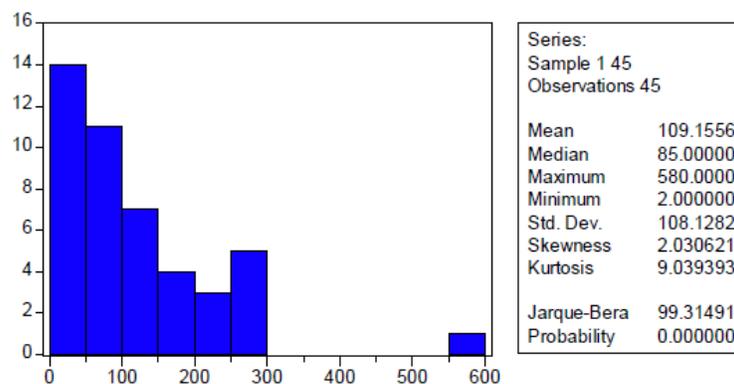


Figure 3: Real distribution of biodiesel production capacities in 2009 (in thousand tones) Source: Data processing from UFOP [6] using EViews [5]

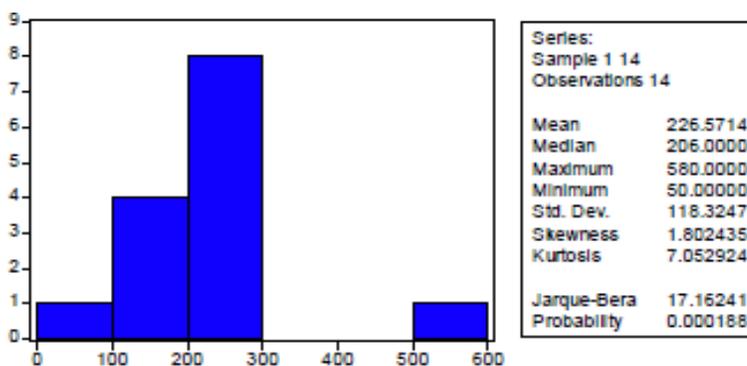


Figure 4: Hypothetical distribution of biodiesel production capacities in 2009 (in thousand tones). Source: Own computation using EViews [5]

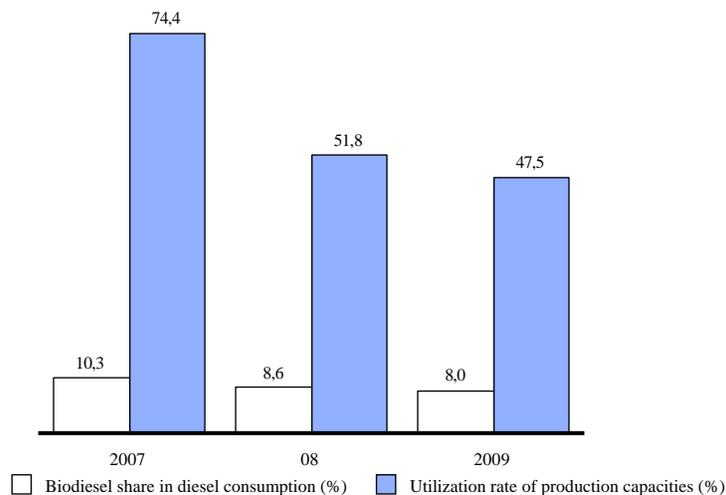


Figure 5: Recent German biodiesel market
 Source: BAFA [1]

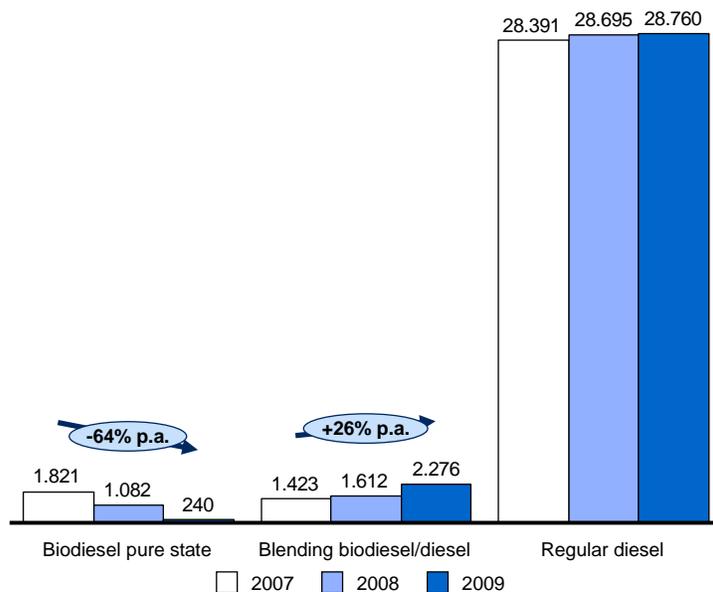


Figure 6: Consumption of biodiesel and diesel in Germany
 Source: UFOP[6] and BAFA[1]

EURcents/liter	Semester IV 2008	Semester I 2009
Costs raw material	82.3	54.7
Auxiliary income (glycerin)	-1.9	-1.9
Production cost	19.8	19.8
Storage and transportation cost	2.6	2.6
Total costs	102.8	75.2
Partial excise taxes	14.9	18.4
Total costs after excise	117.6	93.6
Costs for regular diesel (incl. excise)	108.2	85.5
Cost difference diesel - biodiesel	-9.4	-8.1

Table 1: Estimations for biodiesel and diesel production costs in Germany
Source: Processing of data provided by the German Parliamen