

THE EUROPEAN AND ITALIAN TRADE OF THE FIRST GENERATION BIOFUELS¹

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Abstract

The latest EU Directives stimulate the spread of the biomass use for energy purposes, but impose restrictive parameters to achieve a more suitable and sustainable development of this sector. This refers especially to the use of this renewable source for biofuels production, particularly the first generation ones both within the European Union and outside. This will influence the future trend of the global biofuels trade, as well as the related feedstocks. It also becomes an important issue, because of some of the main biofuels producer countries, especially European ones, need to import large quantities of biofuels and/or their feedstocks.

This second note of the authors' research aims to describe the first generation biofuels trade and its features, particularly at European and Italian level. The latest EU regulations and the main biofuel support policies have been analysed too for underlining the positive oncoming developments and, at the same time, the implications about this trade.

Riassunto

Le ultime Direttive UE incentivano la promozione dell'impiego della biomassa per fini energetici, ma impongono dei parametri restrittivi per

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raggiungere uno sviluppo più adeguato e sostenibile di questo settore. In particolare il riferimento è all'utilizzo di questa fonte rinnovabile per la produzione di biocarburanti, soprattutto quelli di prima generazione, sia nell'UE che fuori.

Questo influenzerà l'andamento futuro del commercio mondiale dei biocombustibili, nonché delle relative materie prime. Si tratta di un aspetto importante in quanto alcuni dei principali paesi produttori di biocarburanti, soprattutto quelli europei, hanno bisogno di importare grandi quantità di biocarburanti e/o le rispettive materie prime.

La seconda nota della ricerca si propone di descrivere il commercio dei biocombustibili di prima generazione e le sue caratteristiche, soprattutto a livello Europeo e Italiano. Inoltre le ultime normative UE e le principali politiche di sostegno a favore dei biocarburanti sono state analizzate al fine di sottolineare i previsti sviluppi positivi e, allo stesso tempo, le implicazioni di questo mercato.

Keywords: EU regulation, trade, 1° generation biofuels.

Introduction

Biomass includes several resources, such as agricultural crops and their by-products, waste and by-products from agro-food processing, wood and wood residues, animal waste, the separately collected biodegradable fraction of industrial and municipal waste, and aquatic plants (algae). Biomass resources can be used for energy purposes by means of several conversion technologies, like direct combustion (production of heat and/or electricity), thermo-chemical (e.g., pyrolysis, gasification, Fischer-Tropsch synthesis), biochemical (e.g., anaerobic digestion and fermentation) and agro-chemical (e.g., sunflower oil extraction or waste cooking oil processing and bio-refining¹).

The last three conversion technologies are suitable for biofuel production and, among these, the biochemical and agro-chemical processes are well-suited for producing biofuels of the first generation, particularly bioethanol, or ETBE (ethyl-tert-butyl-ether), and biodiesel, the most common commercialized biofuels at present. In the Figure 1 and Figure 2 schematic flow charts of the bioethanol and biodiesel production are shown.

¹ A well-known bio-refining process is NExBTL (next-to-biomass-to-liquid), based on the direct hydrogenation of vegetable oil and animal fat to obtain renewable diesel

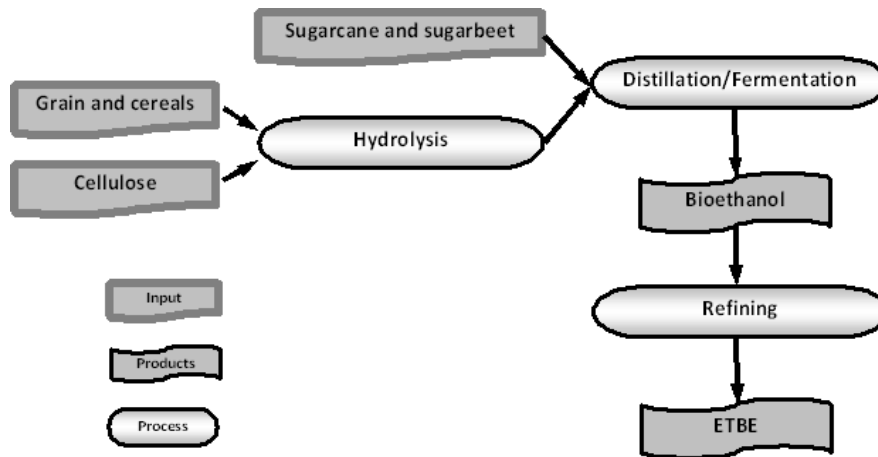


Fig. 1 - The bioethanol production process

Source: (1)

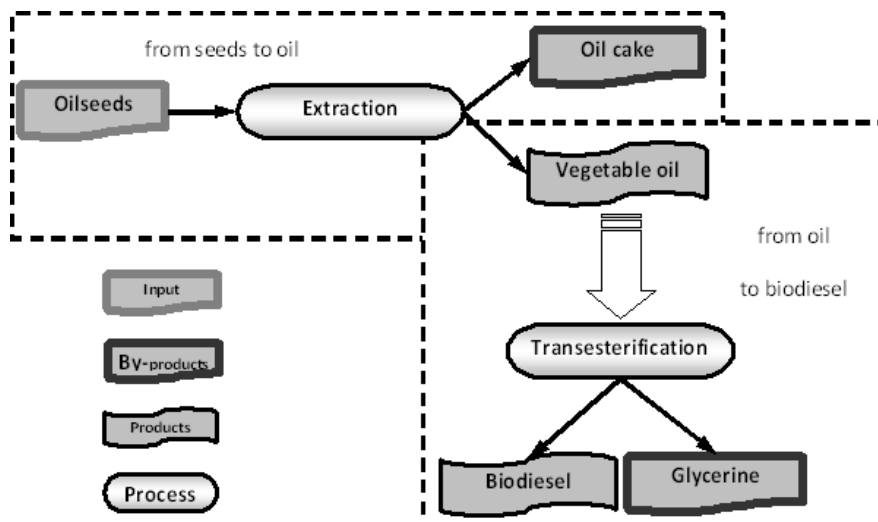


Fig. 2 - The biodiesel production process

Source: (1)

The second note of the authors' research aims to focus the current status of trade of the first generation biofuels, particularly biodiesel and bioethanol, at EU and Italian level. For this purpose in section 2 an overview of the European and Italian market of biofuels and their feedstocks has been made. Hence the current EU regulations, particularly the

Directives that increase the use of energy from renewable sources, have been illustrated in section 3; the biofuel support policies with regards to the international biofuels production, use and trade have been investigated in the forth section. Final remarks and consideration highlight the main issues and the perspective of the first generation biofuel sector in the EU.

OVERVIEW OF THE EUROPEAN AND ITALIAN TRADE OF BIOFUELS

The European Union biofuels market and trade

In the last years the European production of biofuels has grown rapidly, due to the regulations that mandate rising target for the bioenergy use. This is true particularly for biodiesel, as data of Figure 3 illustrate: from 1.4 Million tons (Mt) in 2003, the biodiesel production has increased to 7.7 Million tons in 2008. The rise of bioethanol production (Figure 4) is much more limited, but it is expected a further development.

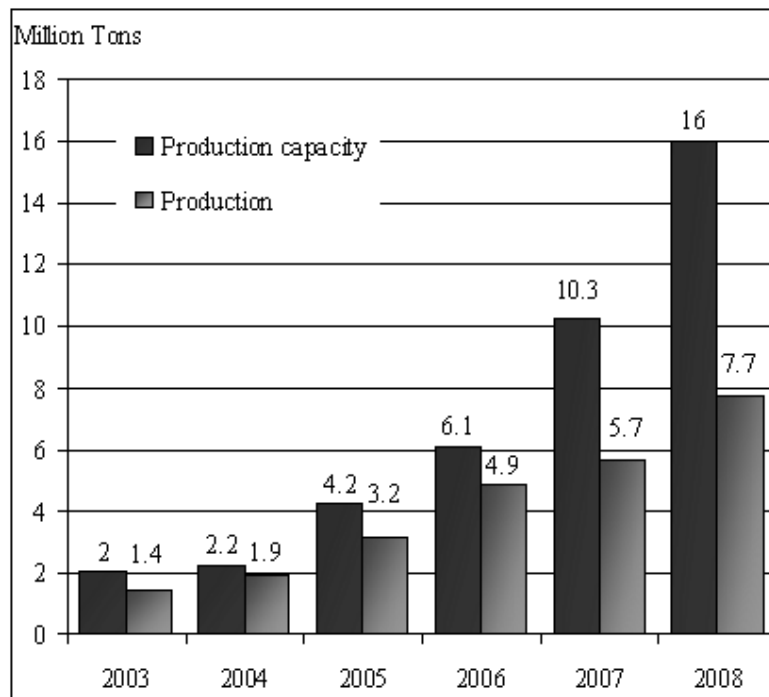


Fig. 3 - Trend of the EU biodiesel production and capacity (Mt)

Source: (2)

Figure 3 also shows another characteristic affecting this sector: the gap between the production of biodiesel and the productive capacity of the relative plants. The last is almost twice than the biodiesel production. This is due to the short measures assumed by many Member States to incentive the biofuel market, in spite of the EU directives that rise the biofuel targets consumption.

This situation can be a restraint to the development of biofuels sector and it could bring to higher fixed costs with following negative consequences on the profitability.

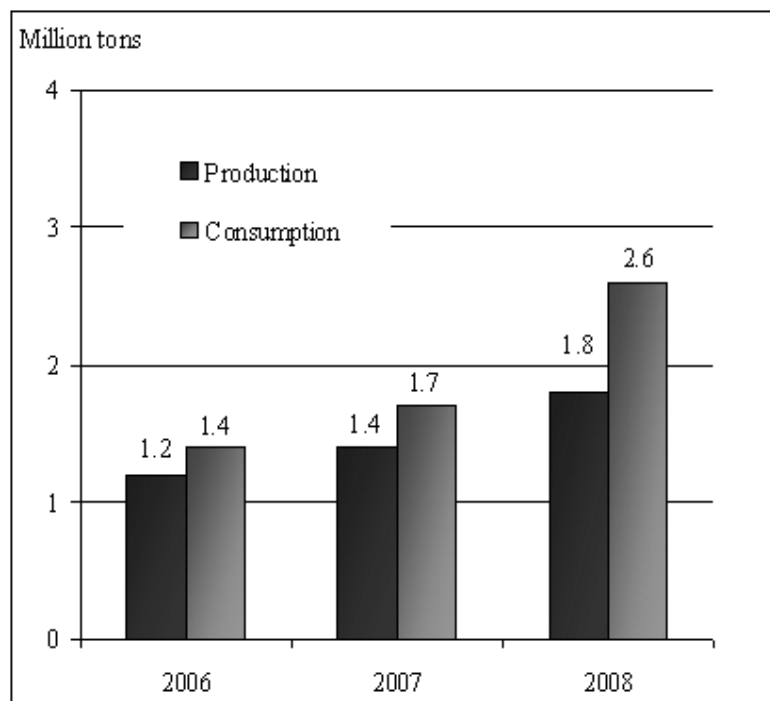


Fig. 4 - Trend of the EU bioethanol production and consumption (Mt)

Source: (3)

The European Union is the first producer of biodiesel worldwide (about 56% of the total). The leading European biodiesel producer is Germany (Table 1), with 2.8 Mt, followed by France and Italy, with 1.8 Mt and 0.7 Mt respectively. Total EU consumption of biodiesel is much higher, equal to 9 Mt. The difference, almost 15% of the total consumption, is imported from the USA, Indonesia and Malaysia.

With regard to the feedstocks, the most part of biodiesel is produced from rapeseed (about 80%), often cultivated in the European Union (4). Within the EU, in fact, there is a trade of rapeseed and/or rapeseed oil concerning some of the European biodiesel producers, like Italy that imports the most of feedstocks, especially rapeseed. From Table 2 it is possible to identify both quantitative and qualitative aspects of the trade in raw materials for biodiesel production, like palm oil and soybean, or its oil, usually imported from Malaysia, Indonesia and Thailand.

The EU production of bioethanol is in the range of 1.8-2.2 Mt in 2008 and the main producers, which are also the biggest consumers, are France, Germany and Spain (Table 1), with respectively 0.7 Mt, 0.4 Mt and 0.3 Mt. Total consumption is equal to 2.6-3.7 Mt, hence the imports are very higher than biodiesel, not in quantity but as volume, and they are in the range from 30% to over 40% of the EU consumption; the main quantity is imported from Brazil and the USA (3, 5).

TABLE 1

**BIODIESEL AND BIOETHANOL PRODUCTION, CONSUMPTION AND
NET TRADE BY MAIN COUNTRIES IN 2008 (MT)**

Countries	Production	Consumption	Net trade
BIODIESEL			
EU-27	7.7	9	-1.3
- Germany	2.8	2.7	0.1
- France	1.8	2.2	-0.4
- Italy	0.7	0.5	0.2
- Belgium	0.3	0.1	0.2
- UK	0.2	0.8	-0.6
- Spain	0.2	0.6	-0.4
- Others	1.7	2.1	-0.4
BIOETHANOL			
EU-27	1.8/2.2	2.6/3.7	-0.8/-1.5
- France	0.7	0.7	-
- Germany	0.4	0.6	-0.2
- Spain	0.3	0.2	0.1
- Poland	0.1	0.08	0.02
- Sweden	0.05	0.3	-0.25
- Italy	0.05	0.1	-0.05
- Others	0.2/0.6	0.62/1.72	-0.42/-1.12

Source: Authors' elaboration on data (3, 5-8)

The 84% of the bioethanol production is converted into ETBE and only 16% is destined to be blended with petrol or used as pure fuel (100%). As regards to feedstock for bioethanol production, Figure 5 shows a marked preponderance of cereals, particularly wheat and maize, respectively 28% e 27%, even though only 2% of the total cereals end-use in EU is destined to bioethanol production. Among other crops sugarbeet is usually used (28%).

TABLE 2

**AN OVERVIEW OF THE EU PRODUCTION AND TRADE
OF BIOMASS IN 2008 (MT)**

Product	Production	Import	Export
<i>Industrial wood and forest products</i>	543	160	153
<i>Agricultural products</i>			
Maize	63	21	13
Wheat	150	27	40
Barley	66	8	11
Oats	9	0.6	0.9
Rye	9	0.7	0.7
Rice	3	0.1	0.07
Rapeseed	20	8	6
Soybean	0.6	16	1
Palm oil	-	6	2
Rapeseed oil	7	2.5	2.5
Soybean oil	2.7	2	1.6
<i>Solid and liquid biofuels</i>			
Fuel wood	35	1.3	1
Charcoal	0.3	0.8	0.2
Ethanol	1.8-2.2		
Biodiesel	7.7		

Sources: Authors' elaboration on data (3, 5-9)

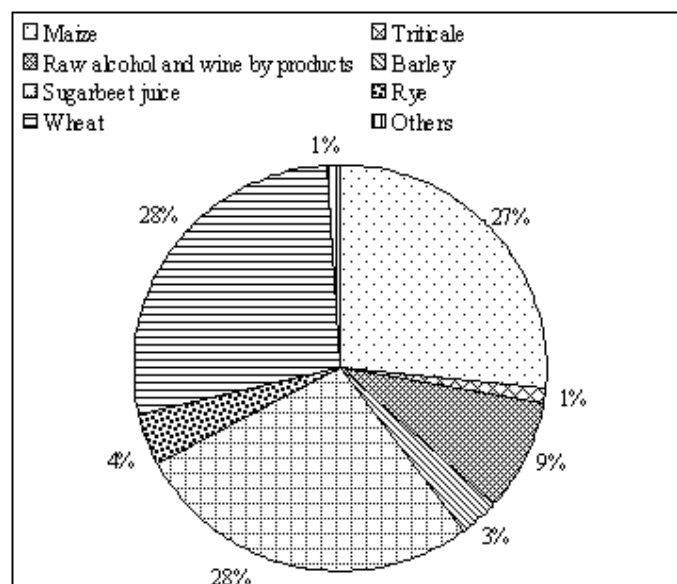


Fig. 5 - Share of EU bioethanol production by feedstock in 2008

Source: (10)

The Italian biofuels market and trade

In Italy the biodiesel production amounts to about 0.7 Mt and it has grown rapidly in the last years. Nevertheless also imports of this biofuel have risen up to 0.46 Mt in 2009 and they come from France, Germany, the USA and other countries (Figure 6). As the total consumption of Italian biodiesel is over 1 Mt, imports are a drop less than 50%. This unbalanced situation is determined by the gap existing between productive capacity and production: the first is three times than the second (Figure 7). This gap is much wider than the European Union one.

The Italian productive capacity is over 2.8 Mt and the main localization of biodiesel plants is in Lombardy, Veneto and Apulia regions (Figure 8). This gap is probably due also to the Italian regulation on biofuels tax reduction that creates a link between the access to these fiscal incentives and the productive capacity of the biodiesel plants: this situation could have led to the oversize of the plants capacity.

Last year biodiesel exports have been equal to 0.09 Mt, going to European countries like Spain and Austria.

Italy imports also numerous feedstocks, like palm oil and soybean from Indonesia, Malaysia and the USA and rapeseed and/or its oil from European countries (e.g. Germany). The main domestic feedstock is sunflower, cultivated in the Centre and South of Italy, followed by rapeseed, most of one presents in the North Italy.

The bioethanol production is much less developed than biodiesel one, partly due to the time lag of the fiscal incentives in comparison with biodiesel. It is equal to 0.102 Mt (Figure 9) and, differently by the EU bioethanol production, the most part is produced from raw alcohol and wine by-products (about 70%) while only 23% comes from cereals, usually of domestic origin (Figure 10).

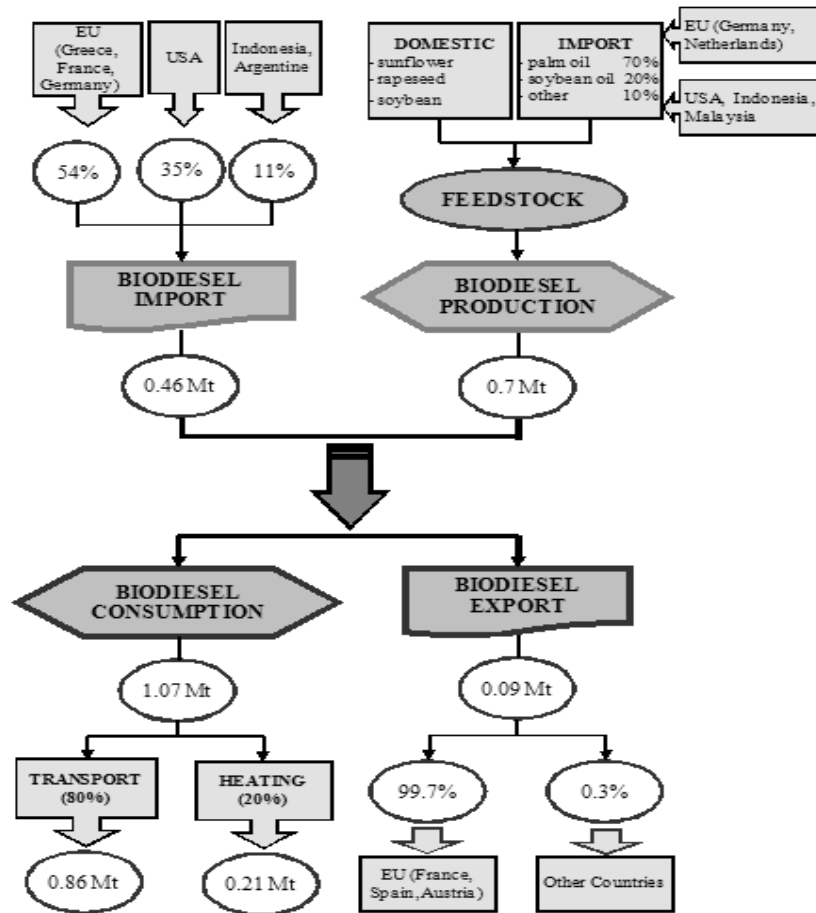


Fig. 6 - The Italian trade of biodiesel (2009)

Sources: Authors' elaboration on data (7, 11)

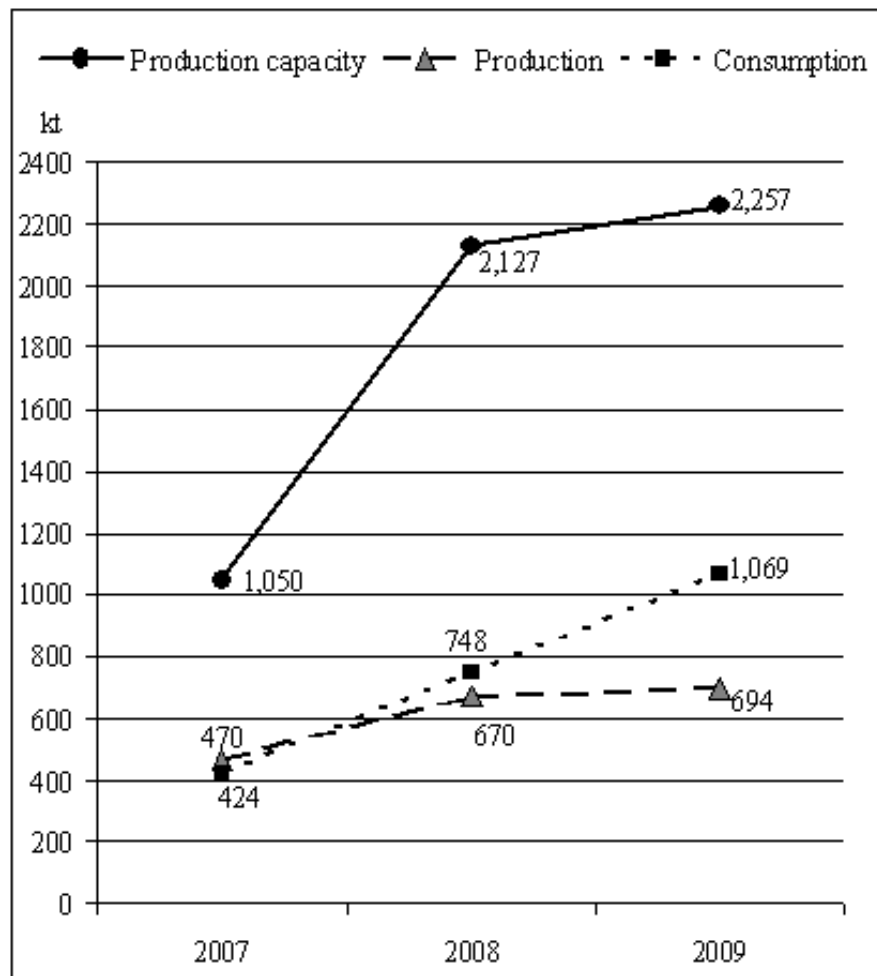


Fig. 7 - Italian biodiesel capacity, production and consumption 2007-2009 (kt)

Source: (11)

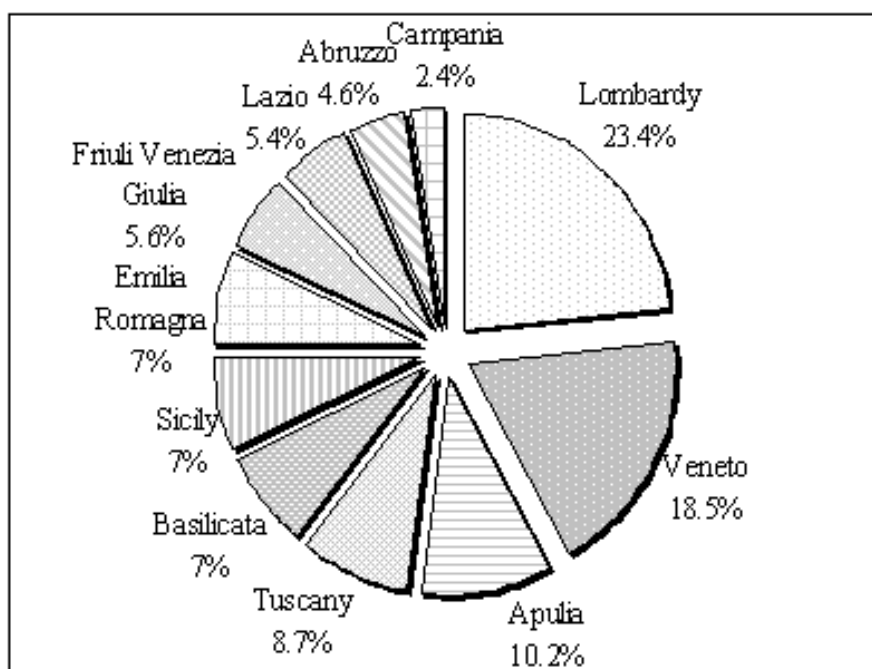


Fig. 8 - Italian productive capacity of biodiesel by regions in 2009 (2,857 kt) (plants under construction including)

Source: (11)

Imports of this biofuel are much higher than ones of its relative feedstock and they come from the USA and Brazil, where bioethanol is predominantly produced from cereals and sugarcane respectively.

Also for this production in Italy there is a surplus of the productive capacity, but less than the biodiesel one (Figure 9).

It is important to underline that the Italian production of bioethanol is low, even in comparison with other EU countries (Table 1) and the almost whole bioethanol produced is converted and then marketed disguised as ETBE.

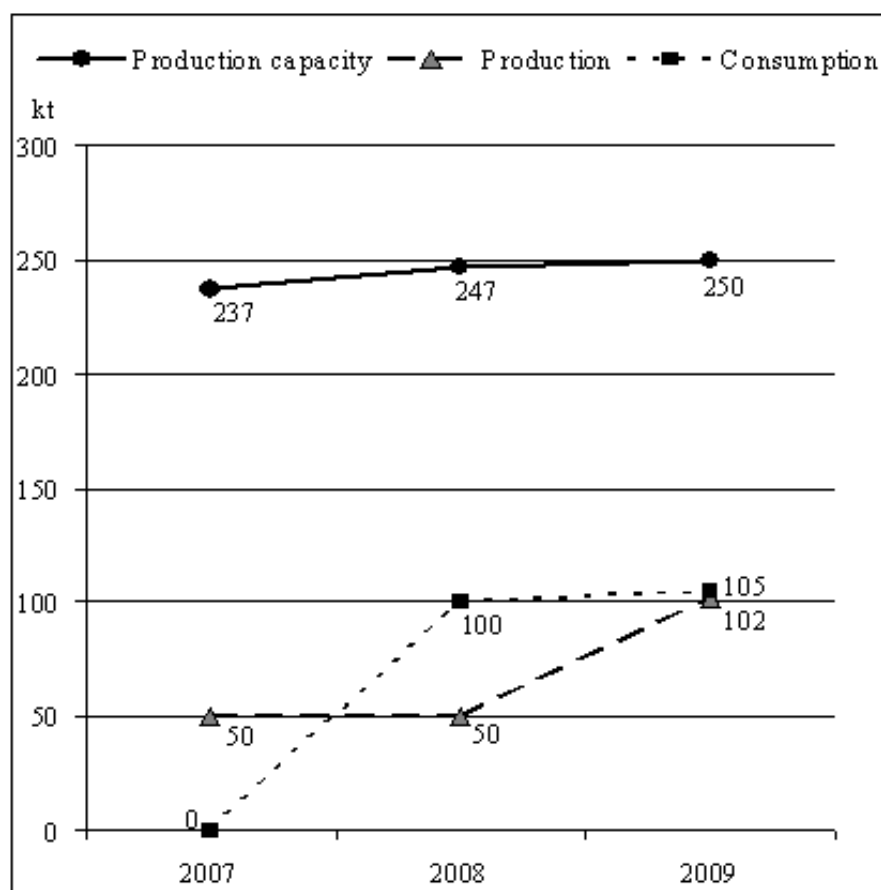


Fig. 9 - Italian bioethanol capacity, production and consumption 2007-2009 (kt)
Sources: Authors' elaboration on data (1, 10-13)

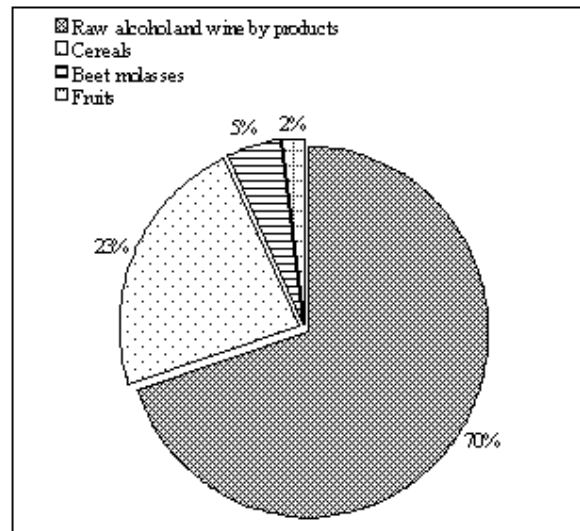


Fig. 10 - Share of the Italian bioethanol production by feedstock in 2008
Source: (14)

THE EUROPEAN REGULATIONS ON BIOFUELS PRODUCTION AND TRADE

The European regulations, about the use of renewable energy sources, incentive the use of biofuels as a feasible tool for achieving the EU environmental policy on the transport sector and for securing and diversifying the energy supply but, at the same time, provide strict sustainability criteria for the worldwide trade concerning biofuels and their feedstocks, particularly the first generation ones.

The Directive 2009/28/EC (15) provides for the basic regulation of the entire package of measures to increase the use of energy from renewable sources, the energy savings and the energy efficiency. As enhancement of these measures the Directive 2009/29/EC (16) and particularly the Directive 2009/30/EC (17), which is about the specification of fuels and their monitoring and reduction of the greenhouse gas emissions, have been enacted.

Notwithstanding the mandatory target of 10% provided by the Directive 2009/28/EC is technically achievable by domestic production, it should be likely that this target is met through a mix of domestic and

foreign production of biofuels and their raw materials. This is in order to secure a long-term and sustainable supply and demand of bioenergy (18).

For this purpose Member States may agree and make arrangements for the statistical transfer on a specific amount of energy from renewable sources from one Member State to another Member State.

Without considering whether the agricultural feedstocks were cultivated inside or outside the territory of the Community, however, energy from biofuels and bioliquids shall fulfil the sustainability criteria. Some of these criteria are the following: a) the greenhouse gas emission savings from the use of biofuels and bioliquids shall be at least 35%. Savings shall be at least 50% from 1 January 2017 and at least 60% from 1 January 2018 for the biofuels production started on or after 1 January 2017; b) biofuels and bioliquids shall not be made from raw materials obtained from land with high biodiversity value, and/or from land with high carbon stock.

There is in fact a concern that production of biofuels in some third countries might not respect the lowest environmental or social requirements. It is therefore important to develop multilateral and bilateral agreements and voluntary international or national schemes that deal with relevant environmental and social issues, in order to carry out the production of biofuels worldwide in a sustainable way. In the absence of summentioned agreements or schemes, Member States should require economic operators to report to these topics.

The economic operators shall submit reliable information and make available to the Member State, on request, the data that were used to develop the information. Member States shall require economic operators to arrange for an adequate standard of independent auditing of the information submitted, and to provide evidence that this has been done. The auditing shall verify that the systems used by economic operators are accurate, reliable and protected against fraud. It shall evaluate the frequency and methodology of sampling and the robustness of the data.

To meet these requirements, the Commission, from 2012 and every two years, shall report to the European Parliament and the Council on national measures taken to respect the sustainability criteria. This is with respect to both third countries and Member States that are a significant source of biofuels or their raw materials consumed within the Community.

Moreover the Commission shall report on the influence of increased demand for biofuel on social sustainability in the Community and in third countries, and on the impact of Community biofuel policies on the availability of low prices for foodstuffs, particularly in the developing

countries. Reports shall address the respect of the land use rights and they also state whether the country, Member State or third country, has ratified and put into practice the main Conventions of the International Labour Organisation.

BIOFUEL SUPPORT POLICIES

In order to support the production and consumption of biofuels, worldwide countries usually adopt a mix of various policy regulations and measures, as illustrated also in the first note of the authors' research (4).

These measures affect various stages of the production and use of bioenergy: for example, biomass production and/or conversion, bioenergy distribution and final consumption.

Some of the typical support measures adopted are direct subsidies per output of biomass, mandatory rates for biofuels, guaranteed prices for biofuels, reduction of distribution costs and excise tax exemptions for biofuels (19). While tax exemptions represent a means for stimulating the demand for biofuels, tariffs are used to stimulate the domestic production and to protect domestic biofuel industries (20).

Import duties and trade policies

Member countries of the EU have also adopted a broad range of tariffs and other border measures. The EU, the USA and others have imposed import duties and other restrictions on foreign bioethanol, biodiesel and their agricultural inputs, but both the EU and the USA offer preferential market access to developing countries by way of unilateral tariff reductions that stimulate imports of certain agricultural commodities and biofuels (21).

As regards to *bioethanol imports*, according to the European Commission, 45% of the ethanol imported by the EU in 2005 was under the normal MFN (Most Favoured Nations) regime, 29% under reduced duty regimes and 26% of the imports had no duties (22).

Under the MFN regime the EU imposes a duty of € 0.192 per litre on undenatured alcohol, while for denatured alcohol (ethanol with additives) the duty is € 0.10 per litre; the standards import tariff for MFN is equivalent to a 63% ad valorem tariff, but several developing countries have preferential access (23).

The EU imports from Brazil, that are about 25% of the total EU bioethanol imports, are under MFN rules; but new rules are expected within the Mercosur-EU agreement whose negotiations are still ongoing (24).

Reduced duty and duty-free regimes correspond to preferential trade arrangements between the EU and developing and less developing countries.

Many countries of Africa, South and Central America and Asia are included in these preferential trade arrangements that aim at drug diversion, sustainable development and good governance. About ethanol, the EU has much more preferential trade regimes than the USA.

Currently, in fact, bioethanol enters the EU duty-free under the Everything But Arms initiative (EBA) for Least Developed Countries and the Cotonou Agreement with African, Caribbean and Pacific (ACP) countries.

The United States charge a 2.5% ad valorem tariff plus an additional € 0.096 per litre “secondary” duty on ethanol intended to be used as a fuel. The exemption to the import duties of additional charge of ethanol is applied to least developed countries according to the GSP (Generalized Systems of Preferences) status, to the Caribbean and Central America countries (CBI agreement), ATPA (Andean Trade Preference Act) countries, Canada, Israel and Mexico (22, 25).

Brazil is currently the largest ethanol exporter to the EU and the USA, under MFN rules, as above mentioned, but bioethanol enters the USA duty free via the Caribbean Basin Initiative (CBI). Brazil, whose imports are much lower than exports, applies an official import tariff of 20% ad valorem on both undenatured and denatured ethanol², in order to open up the international biofuels trade (26).

Biodiesel European imports are also taxed at varying rates due, in part, to the different feedstock used. It is subject to much lower import tariffs than ethanol; these tariffs range from 0% in Switzerland to 6.5% in the EU. In addition, these conditions apply only to the import of the biodiesel itself (as FAME, Fatty Acid Methyl Ester), not to the import of raw materials such as tallow or used cooking oil (21). The oilseeds global trade, particularly soybeans, is relatively unrestricted by tariffs and other border measures; however, oilseed meals, and particularly vegetable oils, have higher tariffs (26).

The European biodiesel market, as said, is protected by a relatively low ad valorem import tariff of 6.5% (25, 27). For vegetable oils destined to technical or industrial uses the rate is even lower (3.2 to 5.1%).

² This tariff has been temporarily waived since 2006.

To let up on rapeseed oil production, European biodiesel producers have started to get feedstock from foreign sources.

So, oilseeds such as soybeans enter duty free and duties on palm oil from the main exporters (Indonesia and Malaysia) are low, in range from 0 to 3.1% (23).

In July 2009 (28, 29) antidumping and countervailing duties were imposed on the imports of biodiesel from the United States of America. This measure has been stimulated by the complaint lodged by the European Biodiesel Board and after an investigation by the European Commission Services. Then, since late 2006, the European Commission has established that the European market has been severely affected by the imports of highly subsidised biodiesel from the USA. In this country each gallon of biodiesel blended with mineral diesel is subsidised by € 0.72, therefore a US biodiesel producer can receive up to € 216 per ton³. This is worth for any blend, without limitations in terms of biodiesel content, as a “B99.9”, that is blend of biodiesel for 99.9% and only 0.1 % of fossil diesel. This benefit is not limited to biodiesel domestic consumption, but it is also extended to its exports.

As a consequence it is expected it will largely reduce the amount of EU biodiesel imports from the United States.

While EU biodiesel producers will benefit from the decreasing of the US exports, other countries exporting biodiesel, such as Argentina, Indonesia, Malaysia and Canada, are also expected to benefit from this situation (30).

In the USA trade barriers for biodiesel do not exist, but groups of interest (the American Soybean Association, for example) are pressing Congress to impose a tariff.

As regards Brazil, in 2004 the National Biodiesel Production Program, similar to its ProAlcool program for ethanol, it has been launched. As a starter on the biodiesel market, Brazil applies an import tariff of 14%, much higher than the USA and the EU.

As mentioned in the first note of the research, a relevant difficulty affecting the biofuel trade is about their classification. The identification and the trade classification of a product is very important to determine the tariff level and eventual subsidies could be applied. It should be noted that the current classification of biofuels is unclear and not aligned with the consumer market, because there are too many international trading rules applied to different parts of the biofuels sector.

³ The exchange rate is 1\$ = 0.72 € at 02.02.2011

Before 2005, biodiesel and bioethanol have been traded as agricultural products. In 2005 the World Customs Organization decided to consider biodiesel as an industrial product, putting it in the Section VI on “products of chemical and allied industries” (HS 382490).

Bioethanol was and is still traded as an agricultural good, under HS 2207 in Chapter 22 on “beverages, spirits and vinegar” (4).

Only fuel ethanol, being pre-blended with petrol, is classified separately under heading 3824 and charged a normal customs duty of around 6 percent. This different classification has relevant implications about the WTO rules on tariff rates and subsidies can be applied to these biofuels, with a more favourable deal for biodiesel (21, 23, 31).

Tax exemptions and support measures

In addition to providing border protection, several countries have adopted other policy regulations and measures to support the biofuels production and use. The production of biofuels in the EU is also heavily subsidised (25).

Among the measures adopted to stimulate and promote the use of biofuels a EU Directive regarding Tax Relief applying to Biofuels (2003/96/EC) was issued in 2003, permitting all member countries to grant excise tax exemptions as biofuel production becomes more widespread within Europe.

Today, most of the EU Member States have introduced exemptions at various levels up to 100% for biofuels produced or blended within European countries.

Italy currently provides tax exemptions for an annual quota of about 200,000 tonnes of biodiesel during the period 2005-2010, as well as reduced excise duties on bioethanol and related bio-derived additives.

Germany is one of few countries with excise tax privileges provided to the 2nd generation biofuels, under the Biofuels Quota Act, 2006 (32).

Germany and Italy have also incorporated a measure that allowed adjustments to be made in the case of over-compensation.

In the USA federal and state governments have provided a variety of other special tax credits, incentives and direct subsidies to the biofuel industry (33).

Brazil offers various tax incentives to bioethanol production. As regards to biodiesel, it also has been introduced a Social Fuel Seal taking into account the agro ecological potential for biodiesel feedstocks production and regional social inequalities.

By which it is possible to benefit from tax exemption on biodiesel produced according to the sustainable way, as certified by the Social Fuel Seal.

FINAL REMARKS AND CONSIDERATIONS

The overview of the trade and regulations of the first generation biofuels in the European Union and in Italy shows a sector on becoming: the biofuels production, particularly biodiesel, has been rapidly increased in the last years, but a suitable development in the short and medium term would be possible only on condition that whichever concerns finds a clear solution.

In the first note of this research, indeed, the difficulties and the several drawbacks of the biofuels production and trade worldwide have been underlined. In the present note, after an overview of the first generation biofuels trade, at the European and Italian market scale, the latest EU regulations and the main biofuel support policies have been analysed in order to underline the positive oncoming developments and, at the same time, the implications on this sector.

Trade protection measures, such as tariffs, for instance, have limited market access for potential developing country producers of biofuels, thus undermining the efficiency of the international pattern of production and resource allocation.

Further concerns that affect this sector are linked to the lack of well-identified classification of the several biofuels worldwide.

Hence, the alignment of the current regulation about these trading issues is a fundamental task for the governments involved, assuming that the trade of biofuels or their feedstocks will probably be increasing in the next period.

This is particularly important for those European Member States, like Italy, whose imports are not a contingent condition, but a structural one, owing to their agricultural features and land availability.

The first matter is connected to the yield of some feedstocks suitable for biofuels production (as palm or sugarcane) that is much more higher in the tropical countries than the European ones; the second matter regards the land area to cultivate the biofuel crops, that is rather limited in the EU, partly due to the strong competition with food crop chain. On the other hand it is important to underline that a global competition for arable

land already globally exists for agro-food production: it is known that several countries, like China, have made trade agreements to cultivate some crops on foreign territories, such as those in Africa, to satisfy their own domestic needs.

Therefore it could be necessary to decouple the future production of biofuels from the land competition and try to rely more and more on residual materials.

Finally it should be important to lay the stress on the studies and analysis of the assessment of the environmental, social and economic impacts of the entire life cycle of biofuels (the first generation as well as the next ones), including the international transport, in order to avoid that perspectives of business deal could affect the real sustainability of this sector.

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