

## Le développement européen du biodiesel

### Biodiesel - a European overview

**Auteur(s) :** Raffaello GAROFALO, Secretary General EBB - European Biodiesel Board, boulevard Saint-Michel, 47, 1040 Bruxelles, Belgium.

**Author(s) :** Raffaello GAROFALO

**Résumé :** L'intérêt à l'égard de la production de biodiesel n'a cessé de croître ces dernières années. Cependant, l'industrie européenne du biodiesel n'est pas une industrie nouvelle et les nombreux avantages liés au développement de ce produit sont connus depuis plusieurs années. Ces avantages sont entre autres d'ordre environnemental (réduction des émissions de CO<sub>2</sub>), agricole (développement rural), énergétique (plus d'indépendance dans l'approvisionnement). Au fil des années, l'Union Européenne et les États membres ont mis en place plusieurs instruments de soutien à l'industrie du biodiesel ainsi qu'à la culture des oléagineux non alimentaires. Aujourd'hui le secteur européen du biodiesel est en pleine expansion mais nécessite un cadre réglementaire clair et stable afin de favoriser les investissements et garantir son développement futur. Les nouvelles propositions de directive de la Commission sur les biocarburants vont dans le bon sens mais leur approbation ne se fera très probablement qu'en 2003 au plus tôt. Une fois mises en œuvre, ces nouvelles législations auront sans nul doute un très fort impact sur la production de biodiesel dans l'UE. Cela dit, l'industrie européenne du biodiesel devra compter avant tout sur ses propres ressources et sur sa capacité incontestée à créer un consensus de la part des autorités politiques, des consommateurs et des industries du pétrole et de l'automobile autour d'un produit de très haute qualité.

**Summary :** The interest around the biodiesel sector has been growing steadily during the last years. However, the EU biodiesel industry is not a new one and the important advantages linked to the development of this product have been well known for many years. Among others, these advantages are very important for the environment (reduction of CO<sub>2</sub> emission), agriculture (rural development), the energy sector (independence of supply). In the past years EU member states have created different instruments for supporting the biodiesel industry as well as the growing of oilseeds for non-food purposes. Today, the EU biodiesel industry is expanding. Meanwhile, it appears that a clear and solid juridical frame for the development of biodiesel is needed in order to attract investors and guarantee its future development. The two recent Commission proposals on biofuels are going in the right direction, however they are likely to be adopted only in the summer 2003 at the earliest. Once approved, this new legislation will certainly have a strong and positive impact on biodiesel production in the EU. In any case the future development of this sector is primarily in the hands of EU biodiesel producers whose duty is to provide their customers with a high quality product in order to enhance the positive image that biodiesel already has among the representatives of the petrol and car industry, as well as among EU consumers and Member States' authorities.

**Mots-clés** : biocarburants, biodiesel, Union Européenne, législation, environnement, pollution de l'air, énergies renouvelables.

**Keywords** : biofuels, biodiesel, European Union, legislation environment, air pollution, renewable energies.

## ARTICLE

In the latest months the interest for biodiesel has been raising in the EU and at international level. This is, of course, good news. However, the biodiesel industry is not a new one and the advantages linked to this product have been well known for many years.

The objective of this article is to give an idea of what the biodiesel business is today in the European Union and what its perspectives of development are. Some considerations are added on the new EU Commission proposals in favour of biofuels and on the outcome of recent negotiations on these proposals in the European Parliament and in the Council of the European Union. Also, the impact of the recent proposals for a mid-term review of the CAP is briefly considered.

### **Biodiesel in the EU yesterday and today**

Biodiesel is a renewable fuel produced from the esterification of vegetable oils. Rapeseed oil is by far the main raw material used for the production of biodiesel in the EU, however sun- flowerseed oil or soybean and used frying oils are also employed, the latter two only in very limited percentage of blend with rapeseed oil.

Biodiesel can be used in the transport sector both when blended with fossil diesel fuel and in pure form depending on national legislations. In France and Italy, it is blended with mineral diesel, while in Germany and Austria biodiesel is normally sold pure. Use of blends between 2 and 30% does not require any modification of the car engine. In some cases minor modifications are required for use at 100% pure.

The use of biodiesel as a transport fuel does not require any change in the distribution system, thus avoiding expensive infrastructure changes.

Biodiesel is also used as an efficient heating oil in Italy.

Biodiesel has been produced on an industrial scale in the European Union since 1992. Positive signals from the EU institutions as well as grow-ing concern for the environment certainly played a part in this development. But in reality it was the fear that oilseed surfaces could decline as a result of the 1992 CAP reform that encouraged the EU Commission to co-finance the first esterification plants in Europe and to draft a first regulation on set-aside land for non-food purposes.

In the last 10 years the biodiesel industry carried on its development. Meanwhile, a change of perspective occurred. At its beginnings the biodiesel business was insolubly linked to agriculture.

Today, environment and energy considerations clearly prevail. Biodiesel has become an independent business and it receives more and more frequently the support of government authorities because of its advantages in terms of environment and independence of energy supply.

#### *Main advantages of biodiesel*

As far as environmental issues are at stake, biodiesel has been demonstrated to have significant benefits in terms of decreased greenhouse gases emissions. Various studies concluded that the use of 1kg of biodiesel leads to the reduction of some 3kg of CO<sub>2</sub>. As such, the increased use of biodiesel represents a significant tool for the EU to meet its CO<sub>2</sub> emission reduction target of Kyoto. Additionally, biodiesel is extremely low in sulphurs and has fast biodegradability. Recently, two studies carried out by Shell and Concawe (the Oil Companies European Organisation for Environment, Health and Safety) acknowledged the environmental advantages of biodiesel.

Biodiesel has also important benefits in terms of health. More specifically, it has a strong impact on the reduction of particulate matters emissions. According to a US Environment Protection Agency study the use of biodiesel instead of petroleum-based diesel could offer a 93.6% reduction in cancer risks from particulate matter emission exposure. More recently, the French Institute for Health Monitoring (INVS) has issued a very interesting study showing that air pollution kills nearly 3,000 people per year in nine of France's largest cities. This is the first time the deaths linked to air pollution are precisely quantified: biodiesel could contribute to considerably reduce these figures.

The potential in terms of rural development is also very important. Rural development is now considered by EU authorities as the "second pillar" of the Common Agricultural Policy (CAP). The production of biodiesel can help diversifying the outlets of the EU agricultural production and encourage the planting of oilseed crops which are less demanding in terms of pesticides and fertilizers (rapeseed is considered by agronomists as a sort of weed).

Also, an increased production of biodiesel could have a very important impact in terms of new employments, especially in rural areas. A recent study of the German IFO institute has calculated that up to 80% of the detaxation granted to biodiesel in Germany is covered by internalising macroeconomic benefits. This IFO study, "*Total economic assessment of oil seed rape cultivation for biodiesel production*", also comes to the conclusion that the growing biodiesel industry secures some 19,000 jobs in agriculture, processing of raw materials and marketing of biodiesel.

Finally, the development of biodiesel would contribute to the diversification of energy supply. In the case of Europe it could reduce the EU dependence on oil imports. The geographical distribution of oil resources is very unfavourable: today, 78% of petroleum reserves is located in OPEC areas and this percentage is going to increase. The independence of energy supply will become a central issue in Europe in the next ten years: the reserve of petroleum and natural in the North Sea region are quite limited and (with current production) oil reserves in that region will end within 10 to 15 years, while natural gas will last for 25 years.

#### *The present EU regulatory framework*

During the years the European Union has built up a regulatory framework supporting, in a more or less direct way, the production of biodiesel.

Since 1992, biodiesel raw materials are essentially grown on set-aside land. In past years the esterification industry has relied to a significant extent on obtaining the right quantity of raw materials at a competitive price by virtue of the set-aside regime.

However, as of 2002/2003, oilseed hectare aids will be made non-specific and therefore the Blair House limit will not be applied anymore. This means that non-food oilseeds can be grown on normal land.

More directly, various EU programmes and regulations have supported the development of biodiesel. An EU legislation has enabled EU member countries to detax biodiesel production up to a given quota considering the construction of new plants as "pilot projects". More recently, the European Commission has acknowledged the importance of biodiesel by including it in its "Campaign for Take-Off". It has defined it as a "Key Action" and targeted a consumption of 5 million tons of liquid biofuels by 2003.

Also, new legislation providing for a substantial support to biodiesel is currently discussed at EU level, as we will see below.

Specific legislation to promote and regulate the use of biodiesel is in force in various EU member states.

In *France* and in *Italy* biodiesel blends are detaxed within a quota. The Italian quotas should be expanded in the forthcoming months.

In *Germany* no blends are admitted. Unblended biodiesel is free of tax since biodiesel is not considered as a fuel and thus not submitted to tax. There are no quantity limitations. Norway and Sweden have a similar system, but their production is negligible compared with the German one.

In *Austria* pure biodiesel is detaxed, detaxation would also apply, so far only in theory, to blends at less than 2% in fossil fuels.

In *other EU countries* detaxation is applied under different forms. Also the UK government should now introduce some form of (partial) detaxation for biodiesel. In the CEECs, the Czech Republic has developed for many years an important legislation in favour of biodiesel.

*On the contrary many other EU member states* (Spain, Portugal, Greece, Slovakia, Poland, Hungary) have no system of detaxation. However, they seem very interested to install capacities for the production of biodiesel. Some kind of legislation in favour of biodiesel is now under discussion in Poland.

### *Volumes of production*

Europe is the main world producer of biodiesel. Production is obviously concentrated in those countries where detaxation is provided. The main producers are Germany and France. They produced last year roughly 350,000 tons of biodiesel each. They are followed by Italy with more than 100,000. The overall production figure of the other EU member states is still quite low.

### *EU capacities*

EU esterification capacities and biodiesel production have increased sharply. The capacities almost doubled between 1996 and 2001.

The UK does not produce any biofuel so far. However, rapeseed oil esterification units could be created very soon if the proposal for detaxation is definitely approved.

The global EU 2001 biodiesel production capacities were estimated at above 1,600,000 tons per year.

Biodiesel seems to attract more and more investors. This is particularly true for Germany, where the biodiesel market was boosted last years by high gasoil prices (especially in 2000-2001) and increased levels of carbon tax. In some cases this has led to a unrealistic assessment of the business.

In Germany and in other member states very important investments in new capacities have been done or are planned over the medium term. If these and other projects were to be finalised the EU production could increase sensibly in the medium term.

This could push the EU production capacities close to 2 million tonnes already in 2002.

### *Marketing (how biodiesel is sold - distributed - to whom?)*

The marketing of biodiesel differs substantially from the marketing of its raw material, vegetable oils: since its beginnings biodiesel has been sold as an "outsider" product in the petroleum market. In the case of blends its marketing is complicated by the fact that customers take part to the processing since blending needs to be done in oil refineries.

The main customers are by order of importance:

- oil refineries,
- retailers,
- (single) oils pumps (especially when it is sold pure),
- owner of captive fleets (normally local authorities).

Biodiesel is an "outsider" product, but its customers only purchase it if it appears as a "normal" product, eventually with some "green" characteristics. In this frame the main objective of all marketing of biodiesel is how to meet the requirements of the petroleum business in order to achieve market penetration. This is particularly true in the case of oil refineries (the main customers) that need both a high quality product and a very efficient delivery and distribution service.

### *Stakeholders position*

The alliance and support of the other stake- holders are essential for the future of biodiesel. Even though its environmental and health benefits are clear, biodiesel cannot be developed without the support of car manufacturers or petrol companies.

In this perspective the biodiesel industry undertook important efforts in order to provide its main partners with clear guarantees on the quality of the product. Many tests undertaken by motor manufacturers in the EU on blends with diesel oil between 2 or 30 and 100% pure have resulted on guarantees for each type of use. As a result car manufacturers and oil companies have started to accept it as a fully reliable product. Their position in some cases is even very supportive. As an example PSA Peugeot-Citroën has been for many years a fervent supporter of biodiesel. The internal PSA fleet of diesel car (700 vehicles) is running with a 30% biodiesel fuel. Equally some petroleum companies like TotalFinaElf were so convinced by the advantages of this biofuel that they directly stepped into the business and built up some biodiesel production capacities.

However, the position of car manufacturers and petroleum companies will always be a pragmatic one. Of course, the "green" image of biodiesel represents a marketing asset, but the priority remains the need to guarantee engine performances. In this context the quality of the biodiesel that EU producers can provide is the key factor of its success.

It is also worth highlighting that car manufacturers as well as petroleum companies prefer to consider biodiesel as an additive for existing fuels rather than a pure fuel. Car manufacturers have observed better performances with blends of biodiesel. On the other hand petroleum companies obviously prefer the concept of addition to the one of substitution.

In order to compete with the lower prices of mineral oils, biodiesel needs detaxation and whenever possible a cheaper access to raw materials. The favourable opinion of the politicians is therefore essential.

In the past the voice of opponents sometimes represented an important obstacle. The "Greens" and some EU member states were not convinced by the environmental benefits of biofuels. Some even feared that it could lead to the intensification of rapeseed production in Europe and to an increase in the use of fertilisers and pesticides.

Also, some member states were not eager to abandon the benefits generated by excise duties.

This situation is now changing. Politicians at member states level as well as at local scale seem to appreciate more and more the advantages linked to the development of biodiesel. At European level the detaxation of biodiesel is not opposed by any member state anymore.

### **Economics of biodiesel**

It would be difficult to explain the functioning and the main figures of the biodiesel business in the EU without adding some words on the economics of biodiesel.

#### *Cost and price structure*

The economics of the biodiesel business can only be explained by starting from its cost and price structure.

The cost of biodiesel mainly depends on the world prices of vegetable oils. However, the biodiesel business is a very specific one: it does not work on a well-defined margin like the vegetable oils crushing and refining sector: the biodiesel industry only uses vegetable oils as a raw material.

This point is essential since the price of biodiesel is also closely linked to the price of mineral oils and to the locally applied level of detaxation.

In this framework the level of the petroleum tax is a crucial factor. Biodiesel needs both to be granted a substantial detaxation and to be sold in a context of strong petroleum taxation in order to be competitive.

Processing costs also have some importance and represent 5 to 10% of overall costs. Such costs include processing chemicals (methanol and sodium sulfate), electricity and logistics. Small production units (under 5,000 tons per year) have sensibly higher costs in terms of chemicals and logistics and are not economically viable if a quality product is to be produced. The importance of processing costs should decrease together with the development of biodiesel production, because of scale economies and as a result of R&D activities.

### *Glycerine market*

The issue of glycerine is a crucial one and deserves some explanation. Glycerine is the by-product of esterification. It would be more appropriate to call it a co-product since it is more valuable than the biodiesel itself.

The world-wide market of glycerine is in reality a niche market (900,000 tons approximately). Obviously, such a market is very sensitive. The existence of many different applications (today there are more than 1,000 different applications for glycerine) and the research and development studies should avoid a future excess of glycerine in the world-wide market, also in case of sharp increase in the production of biodiesel.

### *Quality*

Quality represents the key word for the future development of biodiesel and is needed in order to convince an increasing number of customers, shareholders and public authorities to use this biofuel.

The European Union and the CEN are now setting a number of precise standard requirements for defining a high quality product. These requirements are already met by our industry and need to be met in the future by any new participant in order to ensure the development of our business.

This is not only an issue of processing know-how: the biodiesel industry also needs to be more self-disciplined. It would be extremely unwise for producers to jump into an intrinsically sensitive market which is temporarily profitable. With this in mind the industry must concentrate on providing a product of the highest quality and in the appropriate quantities.

In this context we must pay particular attention to the quality of Used Frying Oils (UFO), as well as to limit their use to maximum 10% of all raw materials. Similarly we must discourage the production of an inferior product by small, undisciplined producers: the current quality of what we could call "local biodiesel" is sometimes already far below what should be tolerated.

## Legislative developments at European level

### *Two Commissions proposed directives in favour of biofuels*

Recent regulatory developments at EU level are very interesting and could have a radical impact on the biofuel industry. In July 2001 the European Commission Directorate General for Transport and Energy (DG TREN) presented two proposals in favour of biofuels. The first provides for compulsory targets of use of biofuels in transport and the second would enable member states to reduce or exempt biofuels from the excise duty on mineral oils.

The first proposal on the "promotion" of biofuels would force each EU member state to use at least 2% of its fuel consumption in the form of biofuels as from 2005. Such percentage should gradually raise to 5.75% by 2010.

The proposal should leave a lot of flexibility to local authorities concerning the choice of formulas of biodiesel (blended, pure or captive fleets...), a choice of biofuel (biodiesel, ethanol, etc.).

The "promotion" proposal is coupled with a draft EU directive allowing member states to detax biofuels, if they wish to do so (*i.e.* it would only open the possibility for member states to detax biofuels without a prior authorisation from Brussels).

Both proposals still need to be adopted. The debate on these proposals has been very intense in May and June 2002. The outcome of recent negotiations is quite positive.

### *Outcome of the recent negotiations on these two Commission proposals*

In the EU Council member states have reached a political agreement on the draft directive on detaxation. Such political agreement will enable those member states who intend to do so to allow a tax exemption or tax reduction on biofuels. Unfortunately, this political agreement will not be immediately enforceable: a large majority of member states have agreed to give their formal approval to this detaxation directive, only provided that:

1. The other proposal on the promotion of biofuels contains exclusively indicative targets.
2. The two proposals on detaxation and on promotion of biofuels are approved at same time.

In practice this means that detaxation will only be approved at the end of the co-decision procedure, which is the decision-making procedure applied to the proposed directive on the "promotion" of biofuels.

On the other hand, the European Parliament (EP) recently voted its final first reading opinion on this other proposal. The EP decided to table 58 amendments to the initial Commission draft. It also decided to keep all the mandatory targets proposed by the EC Commission, at variance with the Council which has already found an agreement on *indicative* targets.

It should be made clear that, even though the opinions of the EP and the Council are diverging, the outcome of the recent EP vote looks quite favourable to the biodiesel industry. The EP is fully aware that at the very end, indicative targets will be retained, but still prefers to keep its position on mandatory targets in order to have something to trade with the Council in the second reading.



The EP wants to make sure that the largest number of the 58 amendments it has voted will be accepted by the Council. Keeping the pressure high on mandatory targets will help in this sense. It is not excluded that the EP will try to trade out some kind of mandatory targets from the Council (either a 2% in 2005 or a revision clause specifying that mandatory targets can be introduced later on in 2006).

After the EP first reading it will be up to the Council to assess the different amendments tabled by the EP and to express a "Council Common Position".

The first reading of the Council will most probably take place next autumn. Given the differences of opinions a second reading of both the EP and the Council will take place. The end of such a decision-making process can be foreseen in summer 2003 at the earliest.

As a consequence the detaxation directive will not be formally adopted at least until this date.

#### *The Commission proposals for a mid-term review of the CAP (impact on non-food crops)*

The EU Commission has recently presented (beginning of July 2002) its new proposals for a midterm review of the CAP. If approved, their impact on the availability of raw material for the biodiesel industry could be quite high.

Among the Commission proposals the current set-aside arrangements should be replaced by long-term environmental set-aside. The new set-aside arrangements would no longer lend themselves to the production of energy crops. This would mean that no more rapeseed or oilseeds for biodiesel production could be grown on set-aside.

However, non-food crops will be of increasing importance, should biofuel incorporation attain the targets foreseen in the Commission's recent proposed directive for the promotion of biofuels.

The Commission therefore proposes replacing the existing arrangements for non-food crops with carbon credits: a non-crop specific aid for energy crops with the objective of achieving carbon dioxide substitution. Such an aid would complement investment and establish measures under the second pillar (*i.e.* under the single Regulation rural development).

According to the Commission the aid level should be 45 euros per hectare of energy crops with a maximum guaranteed area of 1.5 million hectares and would be paid to producers entering into a contract with a processor. The area allocation among member states should take into account historical energy crop production on set-aside and CO<sub>2</sub> commitment burden sharing arrangements. The arrangements will be reviewed five years after their entry into force taking into account the way in which each member state will have implemented the targets of the EU directive on the promotion of biofuels.

Sofar, the overall Commission proposals are very controversial, but times are not mature for a definitive answer on whether this reform will be adopted with no changes on the energy crops chapter. Germany, Britain, the Netherlands, Sweden and Denmark broadly welcomed the proposed reform as a good basis for discussion, although they believe the reform should substantially reduce EU expenditure for farm subsidies. The other 10 member states said the reforms were too radical and could harm their farming industry.

Commissioner Fischler hopes to complete negotiations on the CAP mid-term review by Spring 2003, and have it implemented by 2004. The Council decides on this issue by qualified majority. However, the CAP reform could be referred to the European Council. The German Foreign Minister Joschka Fischer said that a special EU summit might be necessary under the Danish presidency to reform the Common Agricultural Policy (CAP).

The European Parliament debate on the CAP mid-term review is planned for November 2002.

As far as the biodiesel industry is concerned some worries are already expressed about a sharp increase of the demand for oilseeds grown in "normal" surfaces, since "set-aside surfaces" will not be allowed anymore for the growing of non-food oilseeds. The fear is that this sharp increase in the demand could lead to an increase in the price of rapeseed and rapeseed oil.

### **Some strategic considerations**

As a conclusion it is useful to underline what will be the key success factors for biodiesel not only in the EU but also world-wide.

The first point that deserves to be underlined is the issue of quality: quality is definitely the key word for guaranteeing the future of biodiesel production. A bad product gives a bad image and our industry does not need it. After all in the transport sector people buy biodiesel because it is good for the environment, and also because it performs appropriately in the engine.

Consequently, we have to make sure that our customer base is not endangered, by guaranteeing the highest quality of our product.

Secondly, biodiesel needs politicians to look at it as an environmentally-friendly product. As highlighted before, in order to be competitive we need both a high taxation of mineral fuels and an important detaxation of biodiesel. If these two conditions are not met, biodiesel is not viable, this at least as far as the economic incentives are enough to persuade the motorist and fuel retailers that it is worthwhile. But we need more: a clear and solid legal frame for the development of biodiesel should to be established at European level. The efforts of EU authorities are going in the right direction, but member states need to translate these efforts into concrete initiatives on the field.

In the latest years biodiesel has gained popularity. Its environmental assets are more and more underlined. EU authorities, as well as the car and petrol industry have understood that it constitutes a viable and interesting resource for the future. Generally speaking it becomes more and more clear that another key word for the development of biodiesel is complementarity and not substitution. Biodiesel shall not be developed against someone or in order to replace another product. Its business needs to grow independently along the lines of a long-term plan of development.

Also, a coherent communication must support and underline the quality and assets of the product. Advertising campaigns must be realistic and focus on the characteristics of biodiesel, without misleading consumers. We cannot make consumers believe that a car can run also if pure rapeseed oil is added to normal fuel. This example can appear as exaggerated, but is what the publicity for a German car clearly showed sometime.

The biodiesel business must rely on its own merits. We do not need to build up an abusive image of the product in order to sell it at a higher price. Its development needs to be gradual and rely on the support of public authorities as well as on the satisfaction of customers and final users. Such a gradual support needs to be followed by a reliable supply of high quality vegetable oil at a coherent price.

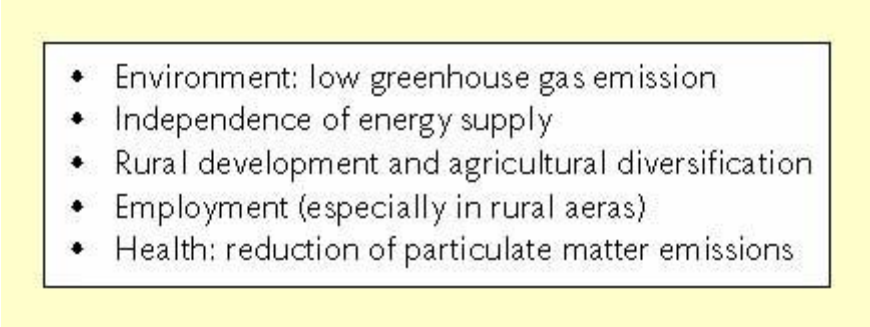
---

#### ERRATUM

OCL, vol. 9, n° 2-3, page 80, La nécrose du collet du colza : analyse de la distribution du champignon dans la plante à l'aide d'outils moléculaires, Jacques SCHMIT, Jonathan WEST, Jean-Paul NARCY, Jacqueline ROUX, Marie-Hélène BALESSENT, Thierry ROUXEL, Lilian GOUT, renvoi 2 concernant les marqueurs ISSR. Il fallait lire : « *Ces marqueurs mettent à profit de courts éléments répétés, les microsatellites largement présents dans de nombreux génomes. L'amplification par PCR à l'aide des amorces appropriées amplifie les régions d'ADN bordées par deux éléments répétés inversés. Les empreintes complexes obtenues permettent de révéler le polymorphisme au niveau spécifique et infra-spécifique dans de nombreux organismes eucaryotes.* »

---

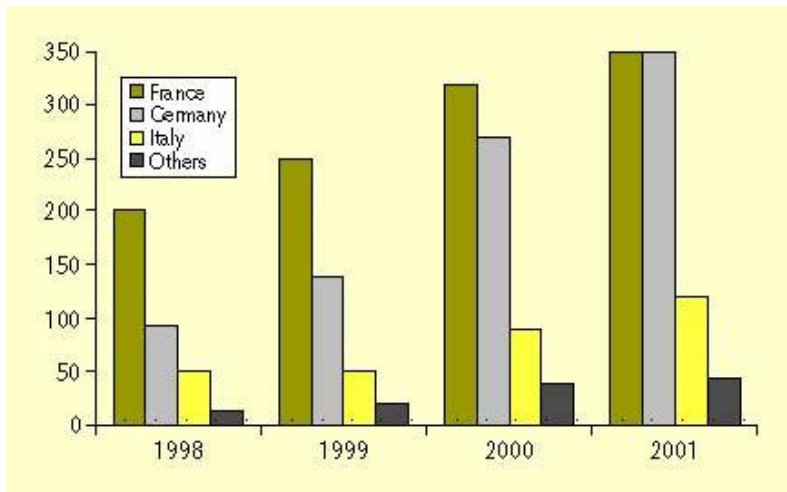
#### Illustrations

- 
- ◆ Environment: low greenhouse gas emission
  - ◆ Independence of energy supply
  - ◆ Rural development and agricultural diversification
  - ◆ Employment (especially in rural areas)
  - ◆ Health: reduction of particulate matter emissions

---

 Figure 1. *Main advantages of biodiesel.*

---



---

**Figure 2.** *Biodiesel production estimates for the last 4 years.*

---