



ANALYSIS OF BARRIERS IN BIODIESEL SUPPLY CHAIN



Intelligent Energy  Europe

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Project **PROBIO**

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1. INTRODUCTION

Deriving from the in-depth analysis of the current rate of biodiesel supply chain integration and its potential, the agencies involved in PROBIO project, have now elaborated Analysis of barriers report, based on the detected technical, economic / market, social and normative barriers in their respective regions or provinces. The barriers were analysed on three levels of biodiesel supply chain: production, distribution and consumption level.

The participating agencies organized expert panel meetings in their regions and so they acquire the data about existing barriers in the development of the biodiesel chain. Some project partners have acquired more data also from other sources.

The following table presents current total consumption in litres, biodiesel consumption in litres and rate of biodiesel use in participating regions.

	Total diesel consumption in litres	Biodiesel consumption in litres	Rate of biodiesel use
Burgos	501.994.118	1.601.653	0,32 %
Avila	152.832.052	315.385	0,21 %
Huelva	418.754.012	9.092.762	2,13 %
Pomurje	31.296.155	350.000	1,12 %
Abruzzo	442.857.143*	13.285.714	3,00 %

* The amount is related to diesel consumption by personal vehicles.

On the basis of the analysis of barrier standing in the way of smooth biodiesel supply chains, the project partners will next elaborate the conceptual strategy on actions to be carried out in order to bridge these barriers and to achieve increase of consumption of the biodiesel.

2. ANALYSIS OF THE CURRENT BARRIERS DETECTED IN THE RESPECTIVE PROVINCES AND REGIONS

The barriers that Energy and Development Agencies analyzed in the development of the biodiesel chain in their provinces have been detected both in the production stage, as well as in the distribution and consumption stages.

2.1 TECHNICAL BARRIERS

BURGOS (SPAIN)

Production level

Most of the local actors involved in the biodiesel supply chain, but mainly the farmers associations and biodiesel producers point out that one of the main technical barriers is the **difficulty of obtaining local raw material**. Nowadays, energy crops for biodiesel production (sunflower, rape, soya...) represent a really good alternative activity for the development of rural areas, but local actors remark that it is highly necessary to change local cultivation conditions. Otherwise, most of the raw material used by biodiesel plants will be imported from developing countries in the future. Some of the facts detected as the reasons of this situation are the following:

- Subsidies and subventions received by the farmers per cultivated hectare (Common Agricultural Policy) are insufficient; therefore energy crops can't be as competitive in market as food crops
- Subventions assigned to energy crops were initially expected to have a bigger impact in Spanish Agriculture but at the end, farmers haven't obtain the expected agricultural yields. This is the reason of the decrease of the number of contracts signed
- Farmers don't perceive the Public Administration support for local raw material, which should receive more subventions in order to increase its competitiveness in relation to imported vegetable oils

- European countries need to research, investigate and experiment with new vegetal species and cultivars which contribute with higher agriculture yields and can be adapted better to the local geographic and climatologic conditions
- Nowadays, the available arable land surface is insufficient due to the yearly obligation of maintaining fallow land among other reasons. Farmers find it necessary to increase the current number of available arable hectares.
- Climate conditions in the Province of Burgos are quite hard, with several frosts during many most of the months. Obviously, this fact isn't a favourable factor if farmers want to ensure productive harvests with energy crops.

A possible solution for the obtaining of local raw material could be to allow producer plants which use **waste oil as raw material** to obtain the licence as authorised waste managers, but the producer plants find several obstacles in the Public Administration to obtain this kind of licence.

Moreover, and according to the representatives of producer plants, in these days there aren't enough investments to set up **oil extractor and refiner plants**. Due to this, these processes must be carried out in places far away from the producer installations.

Distribution level

Both representatives of production and distribution stage consider that the **insufficient and not well developed large-scale distribution network and logistic** is an important barrier for the development of the biodiesel supply chain. The improvement of this logistic, imposed by the big petrol companies, is considered very important. It's also necessary to adapt it to the biodiesel market so that this biofuel can be competitive with traditional diesel.

Consumption level

According to the energy agencies, the distribution, commercialization and consumption of biodiesel in general and in Burgos Province in particular could be limited by the

existence of several different products in the market (B12, B20, B30, B100). This variety could cause bit confusion between consumers.

AVILA (SPAIN)

Production level

Insufficient genetic improvement of species for biodiesel

Agricultural Technical Institute at Regional Level (ITACYL) addresses the meeting to say that in the ITACYL work has been done both in the agricultural section of the biodiesel chain for a long time and in the transformation section, which will be more developed as soon as the biodiesel plant of Villarejo is operative. In relation to the agricultural work the focus lies mainly within the colza, since it is a crop unknown to the farmer and it requires numerous attentions in several aspects, like the sowing time, since it has to be sown before the last week of September because the crop could be lost if the plants have not acquired a rosette shape before the winter freeze. In addition to this, it requires previous work on the ground so that the sowing can be done in optimal conditions, in a dry ground...It is a crop that requires October rain even though it does not need much water and it might cause plague and illness problems.

The variety existing in the market provides different colza productions. Accordingly, there are hybrid varieties of a good potential but they are expensive, and varieties that are ten times cheaper but that provide a reasonable yield.

In relation to the yield, they have obtained so far 2.500 kg/ha in dry farming and he claims that the yield threshold stands in 3.500 kg/ha; therefore it is necessary to wait until this year's results, which have been favourable for the crop together with the past year's, are known.

Lack of compromise of business firms to acquire more productive species

In relation to the increase of yield, ITACYL claims that the seed business firms still need to intensify their work to acquire varieties that are more productive, but that the problem nowadays is that they see no future in these crops, and they thus do not investigate as much as desired.

In this context, ITACYL says that several raw materials that are being tested in the fields are being investigated. The thistle, from which many things are unknown, is among these crops, but he regards the production of biodiesel out of its seed as problematic since a two-year period is needed to obtain the seeds and this displeases the farmers.

Absence of specific knowledge and machinery for new crops

ITACYL says that the jatropha is a possible crop but that it will be difficult for it to be successful since the novelty of the crop is troublesome to accept by the farmers. In relation to the bioethanol, helianthus tuberosus and sorghum are being analyzed, two successful crops when it comes to production despite the need of genetic improvement. In reference to the possible crops, the colza is a good raw material for biodiesel because of its low iodine content, but that it would be interesting to use genetically modified sunflowers

Necessary crops with low iodine content

Colza and modified sunflowers since they could be applied to machines and farming techniques that farmers have been using for a long time; therefore, one of the problems could lie within the need of investments for a new crop, once the machinery for other crops is already available.

ITACYL inform at this moment they are working on a PSE project that analyses the behaviour of the engines that use biodiesel. Currently the main problem has been identified as the presence of iodine; therefore crops with low iodine content are being developed to improve the behaviour of the engines. The said project will soon have its outcome and therefore it will be possible to rely on the outcome of the behaviour of the engines that consume biodiesel during the duration of the PROBIO project. In addition to this, he claims that the current premium of 45€/ha for energetic crops is not likely to increase and that in ITACYL they are in possession of a book on how to cultivate the crops for biofuel production that is arising a substantial interest among the farmers.

Distribution level

Infrastructure

The Petrol Station's representative enquired, in relation to the exposition, the temperature at which biodiesel can freeze, causing damages in the engine, and

whether the reference in the presentation of 7/15 refers to the freezing temperature. It makes clear that the references in the presentation are the percentages of the mixture some petrol stations have in winter (7%) and in summer (15%). We must obtain another barrier from Petrol Station about biodiesel features.

Nowadays, according to Petrol Station Association, petrol stations are using the tanks were Super petrol was previously kept, to store and retail the diesels with additives of each company. In this context, even though it is said in diesel advertising that it has advantages when it comes to the power and the duration of the engine, he has not received any information proving it, despite having asked for it in several occasions.

Asking whether the necessary infrastructures to store biodiesel could actually be a problem when the product is introduced in the petrol stations to be sold, to what Petrol Station Association answers that the tanks where 98oct. petrol is currently stored could be used for that purpose, since it just has approximately a 2% of purchase share.

A Free Petrol Station representative says that free petrol stations use 98oct. petrol tanks to store biodiesel; therefore, the storage and infrastructure problem could be solved by using those tanks.

Concerning whether further problems exist in the storage of biodiesel in relation to other combustibles, to what large distribution dealer answers that not at all, since the storage does not require any other procedure than that of the other combustibles. Furthermore, he states that it causes fewer problems than gas oil and that it had never happened to them that the biodiesel froze. The percentages of biodiesel mixture of the petrol stations to which they deliver vary between 7% and 30%, low % in winter and more % in summer.

Mixture of the fuel

Free Petrol Station National Association upholds the possibility of make the mixture at petrol stations, main distributors prefers the mixture in the factory not at petrol station obviously because is part their bussiness and in order to guarantee the exactly % of mixture.

Consumption level

Distorted information provided by some car business firms

Some cars that have information on the lid of the petrol tank prohibiting the use of biodiesel, for example Volkswagen Group used this information on the cars they commercialized in Spain because there was no warranty that the mixture was correctly produced since it could be done in the petrol station itself.

HUELVA (SPAIN)

Production level

- Companies producing biodiesel are studying other kinds of energy cultivations such as jatropha or seaweed/micro-algae, whose laboratory theoretical values are 20 times higher than traditional energy cultivations.
- There is a need for energy plants with the highest production of oil, because otherwise it will be necessary to have hundreds of thousands of hectares available for each biodiesel producing plants planned for our province.
- However, it would also be interesting to use abandoned lands in order to grow jatropha.
- There are, medium size plants producing biodiesel, in Germany.
- They are in the middle of agricultural areas and they are made up of a refining plant, a crushing machine and a plant producing biodiesel.
- In Huelva, the energy cultivations would have to face the high profitability cultivations such as the strawberry.
- In the province of Huelva, It would be necessary to do a diagnosis on the kind of cultivation to be grown:
 - The conditions required to cultivate raw material aimed at producing biodiesel with the highest quality.
 - the excessive amount of land required to be used for the production of raw material to produce biodiesel.
 - the kind of most suitable raw material to produce biodiesel
- Those who determine the selling price for the oil for biodiesel is the international market, which will influence the final price for biodiesel.
- The most oftenly used raw material for the production of this oil is: soya, rape, and palm. Within 2 or 3 months palm has increased 30%, rape maintains its level and soya has an increase of 10% as a consequence of:

- First Place: China and India are two new large consumers of feeding oil.
- Second Place: the starting industry of biodiesel makes oil become an energy factor so it makes the price of oil increase. Thus, without grants it is not profitable to produce biodiesel as the price it has is very high.
- The forecast is that 20% of the raw material is Spanish as a supply for the plants producing biodiesel in the province of Huelva and the 80% remaining is imported
- Also, all beetroot cultivations aimed at feeding are being used for the production of biodiesel. It is predicted that cooperatives do a change of cultivation towards growing beetroot
- In the province of Huelva to implement energy cultivations it is necessary to implement a complementary cultivation to the strawberry and orange cultivations.
- To do a study in the province of Huelva in order to know which are the most suitable energy cultivations and also to know the profile of the new farmer who would have to take courses to update in this new kind of cultivations
- The company Bionor Transformación, which is one of the plants producing biodiesel in the province of Huelva, will use in its production a mixture of palm and soya, whose oil will be imported from other countries.

Distribution and consumption level - adhesive of "Non biodiesel"

- ANFAC (Asociación Española de Fabricantes de Automóviles y Camiones – Spanish Association of Car and Lorry Manufacturers) as there is no warranty of an organization that guarantees the quality control of biodiesel, they are not willing to eliminate the "Non biodiesel" sticker from the cap of the fuel tank.
- There is a fight by the APPA (Asociación de Productores de Energías Renovables – Association of Renewable Energy Producers) to eliminate the "Non biodiesel" sticker from some vehicles, as it is not a technical problem.
- Currently an agreement, brought together by the IDAE (Instituto para la Diversificación y Ahorro Energético – Institute responsible for Diversification and Energy Saving), has been signed between car manufacturers and biodiesel distributors so that the situation concerning the "Non biodiesel" sticker on the cap of the fuel tank finishes.
- The main barrier why taxi drivers from Huelva do not use biodiesel is because of the "Non biodiesel" sticker that many cars have.
- Concerning blending: we are mixing two products with different densities because the biodiesel is denser than diesel oil.

- But, in Spain diesel oil has always had more density than in other countries so when blending products at 5% diesel oil density is maintained at the limit density =8.45 (which is the one specified by the European regulations)
- When blending more than 5% there is a danger to go beyond that limit density.
- The solution would be to use a kind of diesel oil with less density ($d=8.27$) to be able to do blending at 30% so as not to go beyond the limit density indicated by the European regulations ($d=8.45$)
- According to a study published by the Environmental Ministry from the Spanish Government, the consumption of biodiesel (B-100) for cars emits less greenhouse gas than diesel oil. This is a 3 year study. Concerning energy cost there is a saving of 47%

POMURJE (SLOVENIA)

Production level

Oil-rape as a raw material for biodiesel production, regarding the vegetation and climatic circumstances in Slovenia, is the most appropriate energy plant. A new introduction of oil-rape cultivation in large extent, beside that it is the most important raw material for biodiesel production, has a great significance from the point of permanent preserving of the ground fertility and for balancing rotation of otherwise intensely narrowed of field crops. Oil-rape is perfectly switches into a rotation of crops, during the wintertime it protects ground from erosion and also is a good early crop for stubble grains, feeding and leguminous plants. It has a most positive influence on ground, as it forms a densely spread root system in the cultivated layer and a good deal of humus with its disintegration, that is why it is reasonable to switch it into the rotation of crops in extremely large extent.

Nevertheless, there is **insufficient agricultural surface for the raw material production**. Before all, because of the smallness of Slovenia, that's why on local, as well as on national level there exists a problem of lack of agricultural surface, appropriated for oil-rape cultivation. Another problem is that the oil-rape can not be sowed every year at the same surface, but it needs a rotation of crops (every third or fourth year).

Furthermore, **reliability and durability of raw material supply is uncertain**. Looking forward to a long-term period, the reliability of raw materials production on local level is uncertain as there is a lack of agricultural surface for the energy plants production. More than that the reliability is uncertain, if the prices for the other field crops will be fundamentally increased.

Last year within the frame of agricultural guided companies of the Panvita Groups (the largest repurchaser of grains in region) there was given an offer to all oil-rape producers for repurchasing of crop by market prices based on the contracts concluded before sowing. Thus **the producers have the assured purchase of crop**, which is at the same time with rather high state subventions a good stimulation for them. However, the producers, who sign that agreement, should **assure the minimum amount of oil-rape crop, which amounts this year to 1.920 kg**. That minimum amount is defined in the frame of ordinances about the subsidizing of energy plants production. So if the producer does not assure that minimum amount, the payment of the subsidizing of energy plants production will be freezed, simultaneously the state will freeze him the subsidizing of the entire rest crop, until he explains the reason for the smaller quantitative crop. That negatively influences on decisions for production among the producers. However, the producers in Pomurje have not any problem regarding the minimum assure of crop during last two years, because of the comfort weather conditions. Those problems were met last years, during the dry periods in Pomurje.

In the year 2005 in Slovenia the use of biofuels in fuels for motor vehicles drive in traffic started to grow, however **the trend of increasing has stopped because of technical troubles at use of that fuel and insecure supply with those fuels**. The reliability of supply with biofuels has stabilized and we are expecting that the quantity of biofuels in Slovenia region during the period of 2007-2010 will be slowly to increase.

The quality of biofuel should fulfill the requirements of SIST EN 14214 standard, which defines the quality of metilestr fatty acids for diesel engines. That means that it is necessary to check 25 physically-chemical characteristics at already produced biodiesel according to standard methods upon the extraordinarily expensive devices. However, **the smaller producers of biofuel with their pilot manufacture can not effort such devices and so they can not check the quality of biodiesel. The technology of biodiesel production** has a very important influence on biodiesel's quality, above all the increased content of methanol in connection with increased content of water can cause serious problem at use, which we also had in Slovenia.

Additional barriers that the participants of the expert panel meeting warned us to, are connected to:

Lack of interest for the raw material base increase – there are no sufficient initiatives (either from the authority, or from the private sector side) on local level to increase the raw material base for biodiesel production (beside oil-rape production) with **organised collecting waste oils (public utilities) and animal fat (slaughterhouses)**.

Too small storehouse capacities for the raw materials – this year the only biodiesel producer runs into a problem of too small storehouse capacities on the local level, as this year the oil-rape was sowed at the most surfaces ever, and also the weather conditions favourably influenced at the harvest quantity to hectare, which was rather high.

A problem of exchange or adaptation of agricultural mechanisation – the sowing machines for the classic grains are not too suitable for the oil-rape sowing. And because of closing the sugar mill in Ormož, the oil-rape in many cases substituted the sugar beet in fields, that is why it was necessary to adapt the sowing machines for sugar beet to oil-rape sowing, what causes additional expenses to the farmers.

Additional burden to environment – on producing oil-rape, they use different pesticides and fertilizers, which cause a lot of trouble to environment. Some of the experts think that the oil-rape is one of the plants, the production of which demands a lot of pesticides and fertilizers, which cause principally more troubles to environment than any other plant (above all, its negative influence to underwaters).

Reduction of food production – on increasing of agricultural surfaces for oil-rape production, the prices on other products are also increased, which consecutively influences on increasing the food prices.

Risk of monoculture appearance.

Distribution level

Existed distributors don't have an included tender of pure biodiesel – the biggest distributors in region don't have a pure biodiesel included to tender, that means that those users, who want to spend biodiesel, should address the only biodiesel producer.

Technical equipment of the fuel distributors – none of distributors has appropriate technical equipment for mixing of biodiesel into diesel.

Technical troubles of biodiesel storage – the troubles occur with storage of biodiesel for a long-term period, as it loose its main technical characteristics.

Consumption level

Doubts and risks for final consumers – use of biodiesel for the majority of consumers is rather new, which, at the same time causes some kind of doubts for potential risks for their vehicles.

Influence on the warranty of vehicles producers – mixtures of biodiesel into diesel over 5 % can easily influence on the warranty enforcement by new vehicles, which are not appropriately technical adapted to biodiesel consumption.

ABRUZZO (ITALY)

Production level

Most of the local actors involved in the biodiesel supply chain, but mainly the farmers associations and biodiesel producers point out that one of the main technical barriers is the difficulty of obtaining local raw material. Nowadays, energy crops for biodiesel production (sunflower, rape, soya...) represent a really good alternative activity for the development of rural areas, but local actors remark that it is highly necessary to change local cultivation conditions. At the moment most of the raw material used by biodiesel plants will be imported from developing countries in the future. Some of the facts detected as the reasons of this situation are the following:

- Subsidies and subventions received by the farmers per cultivated hectare (Common Agricultural Policy) are insufficient; therefore energy crops can't be as competitive in market as food crops;
- Farmers don't perceive the Public Administration support for local raw material, which should receive more subventions in order to increase its competitiveness in relation to imported material;
- European countries need to research, investigate and experiment with new vegetal species and cultivars which contribute with higher agriculture yields and can be adapted better to the local geographic and climatologic conditions. In

this sense Teramo University is carrying on the study on the best species to be implanted in the different climatic areas of Regione Abruzzo

Distribution level

In Italy it is not allowed by law to sell more than 5% biodiesel fuel in the normal distribution network (for the general public), and this percentage is not indicated anywhere. Therefore, the customers are not aware of the fact that there is a percentage o biodiesel (max 5%) in the fuel that they bought. This percentage can be higher but only for extra network (tractors, agriculture vehicles, etc...). This is a big constraint on behalf of the Italian Finance Ministry which denies to release the licence to those petrol stations that ask for the permission to sell biodiesel in a percentage higher than 5%.

For these reasons at the moment there isn't any petrol station in Italy that sells biodiesel through a dedicated pump that clearly indicates and promotes the biodiesel. Therefore there is a total **lack of distribution network and logistics**.

Consumption level

Due to the aspects explained in the previous chapter there is a total lack of awareness of the product biodiesel. The general public is not aware of the biodiesel and until it will not be possible to sell it in a higher percentage the consumption will remain very low.

2.2 ECONOMICAL BARRIERS

BURGOS (SPAIN)

The main economic barrier detected is related to the current zero tax rate for biofuels in Spain. According to the Regional Energy Agency, this absence of tax rate for biodiesel makes it be more competitive with the traditional diesel. Nevertheless, if this situation changes due to different economic or politic reasons, the biodiésel market will be seriously harmed as the production costs of biodiésel can't compete with traditional diesel nowadays.

On the other hand, Spain is one of the European countries with the lowest hydrocarbures taxes, which benefits traditional fuels (petrol, diesel) making them more competitive in the market to the detriment of biofuels

AVILA (SPAIN)

Production level

Lack of stability for the farmer, worries and uncertainty

Some news has been received on important price increases as a consequence of the demand of biofuel production plants, both of bioethanol and biodiesel. This could be a problem for the factories, therefore for the price of the biodiesel, at this moment this is not a serious problem.

The Agricultural Trade Union claims that farmers have certain worries and indecision towards energetic crops as a result of news such as the closure of the plant in Babilafuente, close to Avila province, due to problems with raw material prices, this make that there exists uncertainty in the field of biodiesel development.

ITACYL replies that certainly there is some reluctance and that measures, such as model contracts of raw material supply guaranteed by the Ministry of Agriculture, have

been taken to solve it. In this context, it is being used for biodiesel, but it has not experienced a complete development for bioethanol yet.

Necessary increase of the profitability of biodiesel transformation – economic

Within the biodiesel chain, ITACYL representative comments that it would be interesting that the farmers themselves in the cooperative assumed the first transformation from seed to refined oil so to increase the yield of their harvests, just like ACOR, which is going to build its own plant to obtain biodiesel, as well as an oil refining plant.

Value of Glycerine By-Product – economic

In relation to glycerine's by-product, which now enjoys exemptions, ITACYL states that a possible solution would be to raise its energetic value and consequently cause an increase in the economic output of the biodiesel transforming plants.

CARTIF emphasizes the problem of the excess of generation of glycerine in the biodiesel production process. In this context, she states that the CARTIF foundation is elaborating guides that give directions on the chances to make good use of glycerine

Distribution level

Possible lack of infrastructure in petrol stations

Nowadays, according to Petrol Station Association, petrol stations are using the tanks where Super petrol was previously kept, to store and retail the diesels with additives of each company. In this context, even though it is said in diesel advertising that it has advantages when it comes to the power and the duration of the engine, he has not received any information proving it, despite having asked for it in several occasions.

Asking whether the necessary infrastructures to store biodiesel could actually be a problem when the product is introduced in the petrol stations to be sold, to what Petrol Station Association answers that the tanks where 98oct. petrol is currently stored could be used for that purpose, since it just has approximately a 2% of purchase share.

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Concerning whether further problems exist in the storage of biodiesel in relation to other combustibles, to what large distribution dealer answers that not at all, since the storage does not require any other procedure than that of the other combustibles. Furthermore, he states that it causes fewer problems than gas oil and that it had never happened to them that the biodiesel froze. The percentages of biodiesel mixture of the petrol stations to which they deliver vary between 7% and 30%, low % in winter and more % in summer.

Consumption level

Possible loss of the fiscal exemption for biofuels - economic

While the representative of Avila Consumers Association analyses the possible reasons for the late launching of biodiesel, he claims that a possible solution requires the accomplishment of legislation serving this purpose, as well as the fact of paying special attention to taxes on hydrocarbons and other fiscal exemptions, because when the use of these biofuels becomes compulsory and the exemptions disappear, it is possible that the prices increase and that it ceases to be competitive.

AVILA PROVINCE CONSUMERS ASSOCIATION claims that the current fiscal exemption the biofuels enjoy is worrying since it could be eliminated in the future and deem their production no longer profitable; therefore it is necessary to consider an attempt to reduce production costs to maintain the profitability of the plants despite biofuels start being taxed, to what CARTIF states that there is, and will be, an investigation in place to reduce production costs.

Lack of legislative obligation to create an incentive towards biodiesel

All the attendants are agree with the idea than it is necessary to rely on binding % of use increasing to 2010 as the main reason to increase the consumption of biodiesel. In this sense, there is a law proposal at legislation level in order to achieve the objectives; the only way is a legislative obligation that forces the large companies to commercialize biodiesel.

HUELVA (SPAIN)

- There must be commercial agreements among distributors, petrol stations and Local Administrations in order to promote selling and consumption of biodiesel in the province of Huelva.
- The main problem why biodiesel is not promoted or consumed is because large fuel operators have not bet for it. Only small operators are the ones have bet for biodiesel.
- If Public Administrations made an effort, the consumer would pay less for biodiesel, that is, they would have already designed a system to get points of discounts for the consumer.

POMURJE (SLOVENIA)

There are **no any contractual agreements between** local authorities, distributors and larger consumers of biodiesel at the moment, which is also one of the important reasons of rather low production and consecutively consumption of biodiesel.

Last year within the frame of agricultural guided companies of the Panvita Groups (the largest repurchaser of grains in region) there was given an offer to all oil-rape producers for repurchasing of crop by market prices based on the contracts concluded before sowing. Thus the **producers have the assured purchase of crop**, which is **at the same time with rather high state subventions a good stimulation for them**. However, the producers, who sign that agreement, should assure the minimum amount of oil-rape crop, which amounts this year to 1.920 kg. That minimum amount is defined in the frame of ordinances about the subsidizing of energy plants production. So if the producer does not assure that minimum amount, the payment of the subsidizing of energy plants production will be freezed, simultaneously the state will freeze him the subsidizing of the entire rest crop, until he explains the reason for the smaller quantitative crop. That negatively influences on decisions for production among the producers. However, the producers in Pomurje have not any problem regarding the minimum assure of crop during last two years, because of the comfort weather conditions. Those problems were met last years, during the dry periods in Pomurje.

Another problem is a **warranty payment**, as an assurance, that oil-rape will be actually produced. The regulated amount of warranty, which at the Agency RS for agricultural markets and development of countryside (for oil-rape areas in fallow ground 250 € and 65 € to hectare for the surfaces, where asserts the energy supplement, so from the active rotation of crops) should be put as an assurance, that the repurchased oil-rape will be really sold out as a raw material for biofuel, strongly burdens the producers or, in this case, the repurchaser.

Thus the Panvita Group should give the warranty to Agencies RS for agricultural markets and development of countryside for producers, with which it has already concluded agreements about oil-rape production in the period from sowing till harvest. That means a large finance burden for a company, as they have concluded contracts about the oil-rape cultivation for approximately 1.500 ha, which amounts the payment from 90.000 € to 375.000 € in depend on surfaces, for the period of ten months, that destimulatively influences on oil-rape production.

Another negative influence on oil-rape production trend makes an **intensive rise of prices of corns**, which is in comparison with last year increased up to 30-35 %, while the oil-rape prices rose only to 5-10 %. For all that, the areas sown with oil-rape in Slovenia from the year 2005 to 2006 have enlarged from 3.083 ha to 5.374 ha, which is up to 74.3 %.

In experts opinion the oil-rape production is suitable at larger farms, which have 17.45 ha or more cultivated surfaces. For those farms from the year 2004 the fallow ground is obligatory, that amounts 10 % of cultivated surfaces. The areas in obligatory fallow ground can be used for reproduction of raw materials into biofuels or other goods not assigned for human beings or animals nutrition. Thus many farmers decide to grow oil-rape at cultivated surfaced intended for obligatory fallow ground. However, it is impossible to assign a subsidy for energy plants instead of surfaces in fallow ground, as the producers are legitimated subvention, regulated for fallow ground.

Excise payment release

In accordance with the Law about excise of biodiesel fuel as engine fuel or as heating fuel from the year 2007 they are no more excluded out of excise control system and excise tax payment, if they used in original form. In accordance with the Regulation

about the designation of excise amount for energy products it pays of biofuels an excise of 0 euro. In case of a mix of biofuels with fossil fuels, the excise repayment can be implemented mostly to 5 % (last year it was possible to implement the excise repayment up to 25 %). On the base of that Regulation the excise obligator, the producer of excise products, authorised recipient of excise products from another member state, exporter of excise products, legal or natural person, who executes an activity of wholesale trade with excise products or a person, on whom along with the law transmits excise obligatory, in accordance with an Excise Law is obligated to inform customs body when his activity, for which he is bounded to charging and paying of excise, starts, changes or stops. Every person, who becomes an excise obligator, should put in a report by customs body at least 15 days before starting production, storages, receiving or imports of excise products (biofuels). Excise obligators keep regular accounts of excise products by themselves. In accordance with an Excise Law every excise obligator should put in monthly settlements by competent customs house irrespective of whether he obliged to pay excises or not (meant by: customs body control over quantitative biofuel consumption).

As the current excise legislation does not separate excise obligators into legal or natural persons, as well as it does not separate biodiesel production into own and business intentions, every person, who intents to produce biodiesel, should be registered as excise obligator by regional competent customs house.

The distributor of biodiesel is actually discharged the payment of biodiesel excise (the excise payment 0 €), as **the excise level for fuels in Slovenia is one of the lowest in EU, it was also one of the reasons of a slow introduction of biofuel**. The analyze of the prices for fossil fuels and biofuels shows that till the midyear 2006 the excise discharge did not cover the difference between the biofuel price and the appropriate petroleum product. Increasing the tender for biofuel on Slovenian market and increasing the prices to petroleum products, the current excise discharge for distributor is a good stimulation for fuel introduction to market.

Thus, **the prices of biodiesel in retail trade remain high despite of the excise payment release** – the price of biodiesel in retail trade despite of the excise payment release is still not competitive to usual fossil fuel. The experts think that the reduction in retail sale price for biodiesel of 10 % in our place will easily make the biodiesel competitive to fossil fuel.

Subventions for oil-rape production and other energy plants

Provisions of agricultural policy stimulate the production of appropriate field crops for biofuel production. The oil-rape producers, in accordance with the immediate payments ordinance for balancing expenses of production, have a right to immediate payment (subvention) from the state in the amount of 332 €/ha. Besides that, the producers have a right to supplement finance stimulation in the amount of 45 €/ha. That supplement finance stimulation includes also other energy plants, such as soya, sunflower and sorghum, the production of which in our place in comparison with oil-rape is less technological accomplished.

Other stimulations (from finance view)

In the Group of Panvita enterprises, to permanent contract customers, who contractually produce also some other kinds of field crops, are assured a repromaterial payment delay for oil-rape production for the time from sowing till harvest, when the final settlement is ready.

There are no other finance stimulations, such as favourable bank loans, for the energy plants producers, in the region.

One of the barrier that a representative of consumers infomed us about is **too long return on investment period for the vehicles modification** – if the mixture of biodiesel contents in fuel is over 30 %, it is necessary to make adjustment of some definite parts of the vehicle, otherwise the technical problems occur, such as rubber packing falling into pieces, congestion of injection jet, deposits on the engine occurs, etc. As the modification of the vehicles is rather expensive, the repayment period is pretty long.

Also, the producer of biodiesel in Pomurje infomed us about high expenses of production of oil-rape into biodiesel – the biodiesel production is twice more expensive of the diesel production made out of raw petroleum (the profitability of production depends on the tax policy).

ABRUZZO (ITALY)

Before talking about economic barriers it is necessary to solve the constraints on behalf of the Italian Finance Ministry. This is the first step to launch biodiesel in Italy and therefore in Regione Abruzzo.

Nevertheless, the representatives of biodiesel producer also pointed out that at the moment there are so many administrative constraints (especially on transport issues) that oil companies are almost not buying biodiesel anymore.

2.3 SOCIAL BARRIERS

BURGOS (SPAIN)

Distribution and consumption level

The main social barrier has been detected in the last link of the chain: consumers. This barrier has been noticed by all the local actors of the biodiesel chain and it's the **social lack of information and awareness about the use and consumption of biodiesel between general public**. Not only is this general lack of knowledge the cause of the current low rates of biodiesel consumption, but also some disinformation widespread between drivers and consumers about the negative effects of the use of biodiesel in the vehicles mechanisms. This situation makes consumers be more reticent on the use of biodiesel.

All the local actors involved in the biodiesel chain agree about this general lack of information between citizens and consumers, adding that most of the people don't know what biodiesel is and how biodiesel can be used. Due to this, all the local actors assume the necessity of increase the information (quantity and quality) offered to particular drivers and potential big consumers. In this sense, some of the **potential consumers demand complete but simple, clear and understandable information**, which allows biodiesel to be identified as a guaranteed product.

The owners of the petrol stations also notice this consumers distrust, but they remark that another important barrier is the **lack of formation and information between the own employers of the petrol stations**. In this case, it would be a very advisable measure to train and inform these employers so that they can promote biodiesel use with self-confidence and answer consumers their possible doubts.

This general lack of information isn't the only social barrier analyzed. Another important barrier was detected by many local actors but mainly by producers, distributors, petrol stations and especially by the provincial association of automotive business men. This barrier **is the passiveness of the Spanish automobile manufacturers sector towards the promotion of the biofuels use in vehicles**. This passiveness, which could be due to economic or politic reasons, is demonstrated in different aspects:

- a lack of commitments to give guarantees to the consumers for the use of biodiesel in the existent car models, while in several other European countries automobile manufacturers are selling many different models with this kind of guarantees
- an absence of technical information in the different links of the automotive chain, mainly in maintenance and repair services and car dealers. The managers and employers of these businesses hardly receive technical information from manufacturers about the possibilities of biodiesel use in the different models and the information they receive is usually poor and biased. This lack of information is just the cause of several conflicts between car owners, petrol stations, repair shops, etc as in many cases mechanical failures are wrongly attributed to the use of biodiesel.

Nowadays, Spanish Association of Renewable Energy Producers (APPA) and the Spanish National Energy Agency (IDAE) are working together in a control campaign to analyze the quality of the biodiesel sold in Spanish petrol stations in order to demonstrate to the National Association of Automobile Manufacturers that the biodiesel sold is perfectly compatible with the mechanism of almost all new diesel car models. The main objective of this campaign is to change the attitude of the automobile manufacturers towards biodiesel use.

AVILA (SPAIN)

Production level

Lack of farmers' awareness and training

The Agricultural Trade Union have detected some lack of information, awareness and formation for the farmers, then they have been working on the awareness of their associates for approximately a year and half, providing information on the cultivation of raw materials for these productions, paying special attention to colza to what he answers positively because the reach has not been as expected.

The representative comments that this year's colza will start to be harvested soon and that they have had acceptance problems as a consequence of the bad image this crop projects as a result of the "Syndrome of colza oil" occurred years ago in Spain.

In addition to this, the Agricultural Trade Union is working with the City Council to promote these types of productions and they support the biodiesel plant of the cooperative ACOR (Olmedo, Valladolid), by means of being part of their shareholders, in the Avila province there isn't any biodiesel factory at this moment.

Additionally, he stated that, according to his point of view, the diversification of production is very necessary as a consequence of the current agricultural situation, of the abandonment of the beet...that's why the production of biofuels can work as a solution for the agriculture.

It enquires if the farmers clearly know what they are going to obtain out of the raw materials they produce and The Agricultural Trade Union answers that they should know that they will produce biofuel that respects the environment, but that the farmers cannot count on enough information to differentiate whether they are going to produce biodiesel or bioethanol.

The results of agricultural production of material for biodiesel refer to irrigable land or dry farming production. There exists cultivation production for agroenergetic both in dry farming and irrigable lands. They consider a bigger awareness campaign could be a successful action, beside some training courses

Lack of compromise of business firms to acquire more productive species

In relation to the increase of yield, ITACYL claims that the seed business firms still need to intensify their work to acquire varieties that are more productive, but that the problem nowadays is that they see no future in these crops, and they thus do not investigate as much as desired.

In this context, ITACYL says that several raw materials that are being tested in the fields are being investigated. The thistle, from which many things are unknown, is among these crops, but he regards the production of biodiesel out of its seed as problematic since a two-year period is needed to obtain the seeds and this displeases the farmers.

Absence of specific knowledge and machinery for new crops

ITACYL says that the jatropha is a possible crop but that it will be difficult for it to be successful since the novelty of the crop is troublesome to accept by the farmers. In relation to the bioethanol, helianthus tuberosus and sorghum are being analyzed, two successful crops when it comes to production despite the need of genetic improvement. In reference to the possible crops, the colza is a good raw material for biodiesel because of its low iodine content, but that it would be interesting to use genetically modified sunflowers

Lack of strong marketing campaigns

All the participants are agree with the necessary of making a strong marketing campaign focused on target groups as: captive fleets, public administration fleets, general public, farmers and students as future consumers, this campaign must be develop with the institutional support.

Distribution level

Information and Training for the dealers to transmit to the clients

The Petrol Station's representative enquires, in relation to the exposition, the temperature at which biodiesel can freeze, causing damages in the engine, and whether the reference in the presentation of 7/15 refers to the freezing temperature. It makes clear that the references in the presentation are the percentages of the mixture some petrol stations have in winter (7%) and in summer (15%). We must obtain another barrier from Petrol Station about biodiesel features.

It would be interesting to train the petrol retailers in regard to the biofuels and which could be the possible options to increase the use of biodiesel in the final consumer. Regarding to this question several of those present agree that it would be interesting to train the owners of the petrol stations.

Lack of strong marketing campaigns

All the participants are agree with the necessary of making a strong marketing campaign focused on target groups as: captive fleets, public administration fleets, general public, farmers and students as future consumers, this campaign must be develop with the institutional support.

Consumption level

Pre-established ideas on damages in the engine. Client's distrust. Absence of clear reports on the characteristics of biodiesel

Large Distributors representative claims that that “detergent effect” that caused the car’s break down after having had filled up the deposit, has generated much distrust among biodiesel users, though it is quite controlled now. The “detergent effect” has a current low rate of existence. Technological Institute CARTIF replies that it was related to the biodiesel procedure, the emergence of impurities and the crop from which it was originated. CARTIF as well as studying the optimal conditions of the reaction for obtaining biodiesel out of sunflowers, so to avoid the problems of oil impurities, operating, for example, in extremely critic conditions and consequently eliminating the problem of the detergent effect.

CARTIF will start studying the conditions of the biofuels, a specialization work is being done to comply with the agreed biofuels standards as an attempt to solve one of the several aspects required to obtain good biodiesel quality. Crops are within these aspects, with many possible varieties (jatropha, colza...); transformation in refined oil and its many possible processes; biodiesel production...much investigation is needed for all of this.

Additionally, it claims that the problem is the absence of biodiesel sales and that he perceives a consumer distrust, why lorry drivers do not want to consume biodiesel to the point of carriers saying that their truck loses power when travelling through the mountain passes with this combustible, to what large distributors representative answers that some of them say that their lorry cannot drive up the mountain passes properly when using that combustible. In fact the lost of power is about 4% for 100% biodiesel, and then with 15% mixtures could be invaluable.

It enquires whether, as it happens with the new diesels from which no improvement has been proved and which are sold very successfully in the petrol stations, an adequate marketing campaign would not cause an increase on biodiesel sales, especially when there are studies that prove improvements for the engines that consume biodiesel. In this context Large Distributors representative says that undoubtedly a good promotion campaign is needed. Petrol Station representatives agrees and says that a good promotion chance would be exploiting the fact that the duration of the engine increases approximately in

50.000 km; this is a fact, as well as that the engine is better lubricated with this product, that should get through to the consumers.

Necessary information aimed to students

AVILA CONSUMERS ASSOCIATION says that they have already put into practice promotion campaigns to the common public and specific campaigns in high schools and primary schools since they are the future consumers of these products; the importance of education is emphasized and consequently the need to aim promotional activities to the students, the future consumers.

Lack of strong marketing campaigns

All the participants are agree with the necessary of making a strong marketing campaign focused on target groups as: captive fleets, public administration fleets, general public, farmers and students as future consumers, this campaign must be develop with the institutional support.

HUELVA (SPAIN)

- There is still an energy dependence on foreign countries as regards raw material supply.
- Large lack of knowledge among population in general about what is this bio fuel.
- The lack of information existing among the public in general.
- Also, garages must be involved in projects to promote biodiesel, as the consumer, when s/he gets to the garage, the one whom they trust whether to use biodiesel or not is their trust worthy mechanic.
- Biodiesel is not used because it is more expensive because of the lack of knowledge people have.
- With biodiesel we do not find the same problems as with bio ethanol, as it does not compete as a feeding product. So with soya, on the one hand flour is produced and on the other oil.
- Besides, for Spain it is more convenient to consume biodiesel than bio ethanol because most of fleet of cars use biodiesel.

- For Spain it is more convenient to use biodiesel produced in Spain than importing diesel oil from abroad.
- In petrol stations you can find leaflets available explaining what biodiesel is, but the problem is no consumer bothers to read them. So we wonder where this information has to come from so that consumers pay attention for it.
- So that the product is successful there must be: product promotion, guarantee for vehicles and a quality control for biodiesel.
- All parts integrating the production chain and biodiesel consumption must be aware of the problem and get involved, including farmers and consumers, as well as distributors, producers and Public Administrations.

POMURJE (SLOVENIA)

Production level

In general we note lack of initiatives for designing a special educational programme for the oil-rape producers. There are no any educational programmes specially designed for energy plants production at Slovenian universities. Energy plants as an alternative field crop are not dealt with a lot. From time to time it appears also a seminar about energy plants or biodiesel production. There is no any special educational programme about biofuel production designed either.

Within the frame of agricultural guided companies of the Panvita Groups it was designed a manual for the oil-rape production, brought out also at their web sides. Besides that, there is also an on-line expert on the telephone, who is ready to explain any question regarding oil-rape production, as well as to examine someone's field if needed and make advices directly on the fieldwork. Moreover, that expert continuously advices to contracted producers in critical situations, in case of any trouble (for example: a plant disease). Within the frame of that programme the producers had an opportunity of the oil-rape purchasing by market prices.

The Institute of Agriculture and Forestry in Maribor has organized some seminars subjected to oil-rape production. There is also an expert to advice the producers about oil-rape production. Besides that, they continuously publish their step advices in case of any plant disease or trouble in production during the current year.

Distribution level

Not enough information about the petrol stations with biodiesel – there is no information about purchasing of biodiesel in the region.

Consumption level

Too low ecological and technical awareness – not enough of promotional activities on local level, which could influence at a higher ecological and technical public awareness about the use of biodiesel.

Doubts and risks for final consumers – use of biodiesel for the majority of consumers is rather new, that causes some kind of risks for their vehicles. There is a need for information and awareness campaigns.

Too low connection of the involved subjects into the biodiesel production chain – there is also a problem of a little communication and connection among all the involved subjects, which cooperate in the chain from the seed till biodiesel, including the local authorities.

ABRUZZO (ITALY)

The main social barrier has been detected in the last link of the chain: consumers. This barrier has been noticed by all the local actors of the biodiesel chain and it's the **social lack of information and awareness about the use and consumption of biodiesel between general public**. Not only is this general lack of knowledge the cause of the current low rates of biodiesel consumption, but also some disinformation widespread between drivers and consumers about the negative effects of the use of biodiesel in the vehicles mechanisms. This situation makes consumers be more reticent on the use of biodiesel.

All the local actors involved in the biodiesel chain agree about this general lack of information between citizens and consumers, adding that most of the people don't know what biodiesel is and how biodiesel can be used. Due to this, all the local actors

assume the necessity of increase the information (quantity and quality) offered to particular drivers and potential big consumers. In this sense, some of the **potential consumers demand complete but simple, clear and understandable information**, which allows biodiesel to be identified as a guaranteed product.

Another important barrier is the lack of **formation and information between the own employers of the petrol stations**. In this case, it would be a very advisable measure to train and inform these employers so that they can promote biodiesel use with self-confidence and answer consumers their possible doubts. In Regione Abruzzo this would be very interesting in order to train employers and get them ready to sell and promote biodiesel as soon as there is a change in the law to allow the selling of biodiesel.

This general lack of information isn't the only social barrier analyzed. Another important barrier detected is **the passiveness of the automobile manufacturers sector towards the promotion of the biofuels use in vehicles**. This passiveness, which could be due to economic or politic reasons, is demonstrated in different aspects:

- a lack of commitments to give guarantees to the consumers for the use of biodiesel in the existent car models, while in several other European countries automobile manufacturers are selling many different models with this kind of guarantees
- an absence of technical information in the different links of the automotive chain, mainly in maintenance and repair services and car dealers. The managers and employers of these businesses hardly receive technical information from manufacturers about the possibilities of biodiesel use in the different models and the information they receive is usually poor and biased. This lack of information is just the cause of several conflicts between car owners, petrol stations, repair shops, etc as in many cases mechanical failures are wrongly attributed to the use of biodiesel.

2.4 NORMATIVE BARRIERS

BURGOS (SPAIN)

Production level

As explained before it is not allowed by law to sell more than 5% biodiesel fuel in the normal distribution network and this is for sure the biggest barrier that must be overcome in order to really create a market for the biodiesel.

AVILA (SPAIN)

Production level

Necessary crops with low iodine content

Colza and modified sunflowers since they could be applied to machines and farming techniques that farmers have been using for a long time; therefore, one of the problems could lie within the need of investments for a new crop, once the machinery for other crops is already available.

ITACYL inform at this moment they are working on a PSE project that analyses the behaviour of the engines that use biodiesel. Currently the main problem has been identified as the presence of iodine; therefore crops with low iodine content are being developed to improve the behaviour of the engines. The said project will soon have its outcome and therefore it will be possible to rely on the outcome of the behaviour of the engines that consume biodiesel during the duration of the PROBIO project. In addition to this, he claims that the current premium of 45€/ha for energetic crops is not likely to increase and that in ITACYL they are in possession of a book on how to cultivate the crops for biofuel production that is arising a substantial interest among the farmers.

Distribution level

Large oil companies do not sell it

Provincial Petrol Station claims that the problem of biodiesel distribution does not lie within the petrol stations, since 96% of them are owned by the large oil companies that do not allow their associates to sell products that have not been provided by them. Since currently the oil companies do not sell biodiesel, 96% of the petrol stations are unable to commercialize it, and only the free stations (“without a flag”) are able to do it. In addition to the inability of these petrol stations to decide whether they sell the product or not, the oil companies are very reluctant to use it because they have a new market that has originated with the new additive diesels.

In this context, he claims that the only way to promote these types of biofuels is via a legislative obligation that forces the large companies to commercialize biodiesel, or that REPSOL, the company that points out the way in this sector, adopts measures for selling biodiesel since the rest of the companies would surely start selling it too.

Consumption level

Consumption almost exclusively due to environmental reasons

Concerning to the profile of the biodiesel consumer in the petrol stations, Biodiesel Petrol Stations Owners replies that there are hardly any professionals that fill up biofuels and that the consumer is normally an individual who is concerned with the environment and who considers those matters more important than the economic ones. In addition to this, other owners claims that in his petrol station no one has ever said that there is a power reduction in the car; on the contrary, some consumers have argued that their car works better.

Petrol Station owners explains that many cars of the some regional public administration drive through his petrol station and that none of them consumes biodiesel, to what ITACYL says could possible that the possibility of making the consumption of biodiesel compulsory in civil service cars is being studied.

HUELVA (SPAIN)

- Spain has an advantage concerning other countries from the EU, which is the Hydrocarbon Tax Law, so diesel oil is more expensive than biodiesel
- People in general are reluctant to consume biodiesel due to the lack of informing campaigns: the “Non biodiesel” sticker in the vehicles; garages recommend not using biodiesel; public in general think biodiesel is only used by farm vehicles and tractors.
- There are several factors why biodiesel is not profitable:
 - The oil barrel has a very high price
 - It is not profitable to produce biodiesel due to the high price of vegetable oil and so it is more expensive than diesel oil.
- However, thanks to grants given to raw material and the Special Tax Law, it is profitable to produce biodiesel as it is at a lower price than diesel oil.
- In Spain, a law has been recently approved establishing from 2009 onwards the obligation to mix diesel oil with biodiesel at a 5 %. This amount does not vary diesel oil density.
For 2010 both should be mixed at a 5.83%
- Public Administrations are interested to promote biodiesel for which there is a double strategy:
 - Valuation
 - Obligatory nature

On the one hand we can find the Valuation strategy, saying no tax is paid and the price of biodiesel decreases, so the consumer pays less. Therefore, the biodiesel industry is created.

On the other hand, when this first strategy is not good enough due to an increase in the price of oil, or otherwise, when there is an industry of this kind as well as consumption, obligatory nature is established and valuation disappear. Thus, the consumer in the end will pay the same price for biodiesel as for diesel oil.

- If Public Administrations want people in general to consume biodiesel, what they should do is to reduce the price of this bio fuel. I.e.: they can fix the price of diesel oil at 90 cents per litre against biodiesel at 80 cents per litre.
- Also, current vehicles are studied and guaranteed for the diesel oil existing in the market, so that is why there is not a guarantee on the use of biodiesel.
- IDAE and ANFAC have set up an agreement which establishes quality controls paid at 50% by APPA and 50% by IDEA. These quality controls carried out several samplings of all units in Spain selling biodiesel to show that its quality is optimum and it cannot affect vehicles. If the results achieved are positive ANFAC will stop its campaign against the promotion of biodiesel and will guarantee the vehicles that use biodiesel.

Agriculture

- It is necessary to restructure agricultural policy so that grants/subsidies are created, that is, to develop agricultural policies to grow energy cultivations.
- It is important to make farmers aware that it is feasible to grow energy cultivations.
- With views to agricultural policy in our province the energy cultivation is very interesting for the farmer.
- The Ministry of Agriculture from the Spanish Government is trying to reach agreements with farmers to foster the implementation of energy cultivations in our country and it is already a fact as there is a contract model.
- The aim is to promote energy cultivations in retreat land, not in arable land such as strawberry and orange.
- There are no connection mechanisms between farmers and biodiesel producers.
- Local Administrations cannot carry out awareness campaigns at high level; however, State and regional administrations should get involved.

- When the price of biodiesel is reduced there will be more people who will use it.
- Public Administrations are the ones who should promote this bio fuel and their fleet of official cars should use biodiesel.

First of all, so that people in general gets familiar with it and then use it.

Secondly, when vehicles are guaranteed with the use of biodiesel taxi drivers will use biodiesel.

- Pilot schemes should be put into practice within the fleet of official cars in order to promote biodiesel among consumers in general.
- To foster Organizations in charge of Quality Controls to show that biodiesel fulfils current regulations.

POMURJE (SLOVENIA)

Production level

Unsuitable state and local community part by the quicker biofuel introduction – too little attention to the quicker biofuel introduction from the state competence, which by number of its bureaucratic provisions slows down the whole process of introduction.

Incorporating biodiesel production into the regional development strategy is not intensive enough or is even neglected–there is too little attention assigned to biofuel production in the regional development programmes.

Production level

No assurance of repurchasing of biodiesel – the biodiesel producers are not assured (for ex.: from the side of authority) that national distributors will repurchase the biodiesel.

Consumption level

There are **no any specific ordinances or regulations about biofuels consumption either on regional or on local level** (on municipality level) in Pomurje region. All the ordinances or regulations are adopted and in force on national level.

ABRUZZO (ITALY)

As explained before it is not allowed by law to sell more than 5% biodiesel fuel in the normal distribution network and this is for sure the biggest barrier that must be overcome in order to really create a market for the biodiesel.

3. CONCLUSIONS

The five included regions: Burgos (Spain), Avila (Spain), Huelva (Spain), Pomurje (Slovenia) and Abruzzo (Italy) have had elaborated Analysis of barriers report, based on the detected technical, economic / market, social and normative barriers in their respective regions or provinces. The barriers were analysed on three levels of biodiesel supply chain: production, distribution and consumption level.

The table below summarizes and presents the barriers detected in regions, involved in the PROBIO project. The technical, economic, social and legislative barriers that partners detected on production, distribution and consumption level are actually all interconnected and one can have direct or indirect impact on another. That means that the same barriers can be seen from more views, as for example lack of awareness and information, lack of marketing campaigns, low connection of the involved subjects into the biodiesel production chain, These are the barriers that are similar in several included regions. Than are appearing also the differences among the included regions, as for example the climatic circumstances and legislative obligation. Mostly are the barriers quite similar between the analysed regins.

On the basis of the analysis of barrier standing in the way of smooth biodiesel supply chains, the project partners will next elaborate the conceptual strategy on actions to be carried out in order to bridge these barriers. Many of the barriers we detected will be overcome by implementing PROBIO project tasks and activities related to PROBIO project for better integration of the raw material supply and the final consumption in the biodiesel supply chain.

	TECHNICAL	ECONOMIC	SOCIAL	LEGISLATIVE
PRODUCTION	Genetic improvement, research vegetable species-varieties, competitiveness in relation to imported vegetable oils, specific machinery, climatic circumstances, insufficient subventions.	High production costs, lack of stability for farmers, value of By-Product Glycerine, many administrative constraints, intensive rise of prices of corns, no agreements between loc.authorities,distributers and consumers.	Lack of farmers' awareness and training, lack of acquire more productive species, absence of knowledge and machinery for new crops, lack of marketing compaigns.	Not allowed by law to sell more than 5% biodiesel fuel in the distribution network, unsuitable state and local community part by the quicker biofuel introduction, to little attention assigned to biofuel production in the reg.development programmes.
DISTRIBUTION	Biodiesel storage, lack of distribution network and logistics, biodiesel mixture.	No garancy from distributors, that they buy biodisel.	Passiveness of the automobile manufacturers towards the promotion of biodisel use in vehicles, information and training for the dealers to transmit to the clients, lack of marketing compaigns, not enough information about petrol stations with biodisel.	Lack of a legislative obligation that forces the large companies to commercialize biodiesel, local administrations cannot carry out awareness campaigns, no assurance of repurchasing of biodesel.
CONSUMPTION	Doubts and risk for new product, several different products in the market, distorted information from car buisness firms.	No agreements between loc.authorities, distributors and consumers, to long repayment of investment for the vechisles modification.	Social lack of information and awareness (also to students), pre-established ideas on damages in the engine, lack of marketing compaigns, low ecological and technical awareness,doubts and risks for consumers, low connection of the involved subjects.	Low ecological and technical awareness, no specific regulations about biofuels consumption on regional or on local level.