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BIODIESEL CHAINS

Promoting favourable conditions to establish biodiesel market actions

WP4. Market structures

Deliverables 14-16
Case studies: Belgium, Bulgaria, Cyprus, Greece, Poland, Romania

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Intelligent Energy Europe

Biodiesel Chains:

Promoting favourable conditions to establish biodiesel market actions

WP 4 „Market structures“ Final Report

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Content

1 Goal and scope

The goal of this work package is to determine how to create country-specific favourable conditions to increase penetration of biodiesel in the participating countries.

Expected results

The following results are expected from this work package:

A complete analysis of the existing and potential future structure for biodiesel chains in each participating country.

Recommendations to create favourable conditions for such markets to be developed.

2 Task descriptions

In order to reach the goal and scope of work package, the following steps were conducted:

Task 4.1: Policies and regulations

A review of relevant European policies and legislation was undertaken, including both existing Papers, Directives etc and those that are under preparation and likely to be initiated. Particular attention was paid to the rapidly-evolving Common Agriculture Policy.

The project partners reviewed how these European policies and laws are being transposed into national legislation. They reviewed other national legislation and regulations.

The partners conducted a critical assessment that highlights problems and recommends amendments, new initiatives in this field.

A survey of the national policies regarding tax reduction was included as it can show examples to the concerned countries in this project (France applies call for tenders and quota to biodiesel producers for defiscalisation, Germany applies full defiscalisation at market level, eligible to any producer, etc.).

A comparison of the national reaction towards the 2003/30 Directive (national objectives and plans) was also included.

Task 4.2: Raw material supply

The partners reviewed major significant players, such as vegetable oils agro-industries, farmer cooperatives and unions etc. Structure in the sector was assessed including ownership, coordination of actors, access to financial capital, human and other resources. The experience and proven ability of the sector to engage with new product markets was analysed. The analysis highlights opportunities for the sector to develop supplies of oil seeds for biodiesel production. The waste oils sector was also reviewed.

Task 4.3: Biodiesel producers

The partners reviewed potential producers including agro-industries and motor oil industries. Resource capacity was analysed – financial, human etc. – and investment and capacity building needs were identified. Organisations that can lead and enable market development have been studied.

Task 4.4 End users: Transport and heat sector

Forecasts show that especially the transport sector will change a lot within the next decade in many EU25 countries, such as the switch between gasoline and diesel and some penetration of hybrid petrol – electric cars. Trends have been taken into account.

Task 4.5: International trade

There are ongoing debates regarding import and export issues within EU25 and the import of biofuels into the EU. These issues have been monitored and analysed and possible impacts on the development of biodiesel markets in participating countries have been assessed.

Deliverable 14
Review of legislation and regulations

3 Policies and regulations

In this section, a review of relevant European regulations and their evolution is presented with a focus on biodiesel used for transport. This is followed by an evaluation of how this EU policy is being transposed into national legislation and which other national regulations and legislation elements play a role along the biodiesel chain.

3.1 European Union

On the political level of the European Union (EU), the topic of biodiesel – and biofuels in general – is a relatively young one. The early beginnings can be traced back to the 1980's, however it was not until the last decade of the 20th century that issues connected directly to biodiesel became elements of the discussion and gradually firmly established within the policy and legislation of the EU. In November 1996, the Commission presented a Green paper for a Community Strategy titled "Energy for the Future: Renewable Sources of Energy" [EC 1996], which already proposed an ambitious objective, namely to double the renewables' share within 15 years. Only one year later, in view of the United Nations (UN) Conference on climate change in December 1997 (which would bring forth the famous „Kyoto Protocol"), the EU Commission produced a corresponding White Paper for a Community Strategy and Action Plan [EC 1997] – under the same title. These two communications can be considered as the first manifest steps towards establishing a common indicative target for the replacement of conventional energy carriers by renewable ones throughout the Member States.

After this, biofuel-related papers increased rapidly, originating from different fields. In November 2000, another Green Paper was published, titled „Towards a European Strategy for the Security of Energy Supply" [EC 2000], thus naming one of the main drivers for a biofuel promotion policy. This Green Paper suggests a 20% substitution target for 2020. In June 2001, the Commission Communication "A Sustainable Europe for a Better World: A European Union Strategy" [EC 2001a] officially established the connection to the global goal of fighting climate change, in reference to the 1992 United Nations Conference in Rio de Janeiro, Brazil. Besides energy security issues and the target of reducing greenhouse gas emissions, biofuels are seen today as having a great potential to secure domestic agricultural income. In September 2001, another White Paper [EC 2001b] was produced by the Commission which also included the objective of a concrete market share – this time specifically for transport fuels: 6% by 2010. In November of the same year, two proposals for Directives were drafted by the Commission: one which was to generally promote biofuels and one which should provide a framework for their detaxation in the Member States. Both Directives, the so-called „Biofuels Directive" (2003/30) [EPC 2003a] and the „Energy Taxation Directive" (2003/96) [EPC 2006b] were adopted in 2003. The Biofuels Directive set an indicative target of substituting 5.75% of all consumed gasoline and diesel fuel with

biofuels by 2010 (with a 2% interim target for 2005). The Energy Taxation Directive provides for a possibility of Member States to partially or fully exempt biofuels from the excise tax. Detaxation must be granted under notified multi-annual programmes; it applies only to the fuel's biofuel content and may not lead to overcompensation.

With this new target, it was deemed necessary to design more concrete measures for increasing the amounts of biomass available for renewable energies including biofuels. The Biomass Action Plan adopted in December 2005 [EC 2005] represents a list of such measures which might be implemented in the EU; besides the review of existing legislation and standards, topics such as information campaigns, import issues and sustainability criteria are included.

In January 2007, the Commission issued several proposals in a so-called "energy package" regarding a Common EU Energy Policy. Addressing issues such as sustainability, security of supply and competitiveness, it also included the "Renewable Energies Road Map" [EC 2007a] which was adopted by the European Council on March 8 / 9, 2007. While the targets defined in the "Biofuels Directive"(2003/30) [EPC 2003a] are of indicative nature, this new strategy paper calls for overall mandatory shares of 20% renewable energy sources by 2020. The Road Map sets a specific binding sub-target for biofuels: in 2020, at least 10% of the total fuel consumption in every Member State will have to be covered by biofuels. Due to this strategy amendment and with respect to new thematic issues which have been playing increasingly stronger roles in the discussion of biofuels – especially their impacts on the environment – several adaptations of the legal situation are to be expected in the near future. The Directive 2003/30, for example, is currently undergoing a revision process while this report is being finalised. The resulting proposal for a new framework Directive is expected for January 23, 2008.

Besides an adaptation of these targets, sustainability criteria will be included in order to guarantee that the assumed negative impacts on the environment resulting from the increased use of biofuels are actively capped. Corresponding endeavours to develop and eventually implement full-chain sets of such criteria are already in progress, including at the Member State level in the Netherlands, the United Kingdom and Germany, for example. The need and aim to promote the topic of sustainability has lately been a main issue in many reports and documents. Several examples are Communications from the EU Commission to the EU Council and Parliament, e.g. "An Energy Policy for Europe" [EC 2007b], published on Jan. 10, 2007, reports on the review process of the EU Biofuels Directive [EPC 2003a] and a public consultation launched by the Energy and Transport Directorate-General of the European Commission [ETDG 2007] and by the European Biofuels Technology Platform [EBTP 2007]. The EU Council has also noted that a "Global Climate Change Alliance" between the EU and poor (developing) countries, as suggested by the Commission [EC 2007d]., can be an important contribution to enforcing international exchange and cooperation in different fields, among them the reduction of emissions from deforestation, a crucial point of the biofuel sustainability discussion [EC 2007e].

At the same time, the Commission is working on a proposal for a legislation framework for a "Community Strategy" to reduce CO_2 emissions from cars, with the latest trends pointing at a

value of 125 g/km. According to the previous announcement [EC 2006], an increased use of biofuels is also aspired; this measure alone shall lead to “savings” of 10 g/km. Besides mandatory emission reductions, fiscal incentives such as emission-related taxation are being considered.

Regarding quality specifications of biodiesel and blends including biodiesel, three publications must be mentioned:

- the Fuel Quality Directive (98/70/EC) [EPC 1998] which sets technical specifications for gasoline (petrol) and diesel fuel including emission standards; a revision of this Directive has been proposed by the European Commission [EC 2007c], first votes in plenary are expected in early 2008.
- the CEN Diesel Standard EN 590 [CEN 2004] which includes the mandatory limit of a maximum biodiesel content in diesel fuel of 5%; this standard is equally currently being revised with the aim to raise the limit to 10% biodiesel content as requested by the accepted mandate of the European Commission [EBB 2007].
- the CEN Biodiesel Standard EN 14214 [CEN 2003] as a mandatory reference for all Member States and especially biodiesel producers and car manufacturers.

Note: Several of the documents named here under the focus on transport fuels also deal with other energy sectors and the goal of increasing the share of biofuels there, for example in the heating, cooling and electricity sectors (e.g. the Renewable Energy Road Map [EC 2007a]). Theoretically, this could also concern biodiesel as a non-transport fuel, however, as a relatively valuable (liquid) biofuel and because less refined biomass-based energy carriers can be used in heat and power plants, this plays a subordinate role.

The trends indicate that in the near future, both content and formal changes can be expected. One of them is that mandatory targets will likely replace indicative ones, i.e. regulations will become stricter. Regarding some aspects, e.g. the reduction of CO_2 emissions, this will also mean more demanding requirements and restrictions. New topics such as the sustainability of biofuels will also become manifest in the EU biofuel policy and corresponding regulations, for example by accounting for additional quality criteria which will have to be met by producers and traders.

This development is to be seen against the following background: currently, 80% of the European Union’s total biofuel production is biodiesel [EBB 2007]. And in a global comparison, the EU is one of the areas in which biodiesel output is expected to increase drastically in the coming years [Agra Informa 2007].

Summary

The most important aspects concerning biodiesel used as a transport fuel in the current EU policy and legislation are:

- the indicative EU target of a 5.75% biofuel share of all consumed gasoline and diesel fuel by 2010 (provided by the Directive 2003/30 which is currently being revised and will most probably provide for a minimum binding target of 10% by 2020);

- the possibility of each Member State to develop its own biofuel promotion policy and corresponding measures such as tax reduction (without overcompensation), quotas and/or mandatory blending regulations;
- a maximum standard volume content of 5% biodiesel in diesel fuel. Here, endeavours exist to adjust the norm by raising the value to 10%.

Beyond this, it is clear that several changes will be made in the near future. One of the most crucial will be the establishment and realisation of a biofuels sustainability scheme defining minimum requirements concerning the complete biofuel chains.

3.2 Belgium

Transposition of EU Directives

In addition to the Directives 2003/30 and 2003/96 of the Union the following procedure was implemented in Belgium:

Arrêté Royal (published in Moniteur Belge – MB: official journal – March 8, 2005): This law set objectives of 2% by 2005, additional 0.75% per year, to reach 5.75% in 2010 (energy content).

Programme Law (MB July 12, 2005 and Dec. 30, 2005): These laws proposed tax advantages for the various liquid biofuels; they changed several times due to the evolving taxes in Belgium.

Approval of the tax reduction by the European Commission (December 26, 2005)

Arrêté Royal (MB March 20, 2006): Pure plant oil (PPO) was added to the list of products that are tax-free, like the fuels used in agriculture, for example. The starting date was April 3, 2006.

Arrêté Royal (MB June 16, 2006): This law set adapted tax rates and announced the call for tenders procedure for Belgium, together with volume for biodiesel and ethanol as well as dates for making these biofuels available on the market. An evaluation committee was established and criteria for choice were identified.

Official Journal of EC (July 4, 2006): A European call for tenders for biodiesel and ethanol was launched with the deadline August 21, 2006 for applicants.

Press release October 22, 2006: The winners/producers were known for ethanol and the first period for biodiesel. The producers for the second call were known by December 22, 2006.

Arrêté Royal (MB Dec. 7, 2006): This law gives the modalities for biofuels that are not covered by CEN standard (PPO, E85, blends > 5%) and state particularly the modalities for PPO.

Implementation on the Belgian market

In the following, the volumes and eligible blends for tax advantages valid in Belgium are listed for ethanol, biodiesel and pure plant oil.

For ethanol, three steps are planned:

- 48,000 m^3 between October 1, 2007 and December 31, 2007
- 250,000 m^3/yr from 2008 to 2012
- 187,500 m^3 from January 1, 2013 to September 30, 2013

In addition, a tax advantage for min. 7% ethanol through ETBE applies.

For biodiesel, four steps were / are planned:

- 286,000 m^3 between November 1, 2006 and September 30, 2007
- 475,00 m^3 between October 1, 2007 and December 31, 2008
- 380,000 m^3/yr between 2009 and 2012
- tax reduction if min. 3.37% biofuel fraction in 2006, 4.29% in 2007 and 5% after that

In addition, the possibility of a tax reduction for higher blends only exists for regional public transport companies.

PPO is fully exempt from taxes provided the following conditions are fulfilled:

- PPO is produced by farmers and cooperatives,
- use of their own rapeseed and
- direct commercialisation to final users.

Using this system of call for tenders (similar to the system applied in France), Belgium has ensured that investment and production will be operated in the country. It prevents imports of biodiesel because the tax advantage is only allocated to a few known production companies at precise location. However, the choice among producers was difficult and highly politically influenced. In addition the system is not flexible regarding the quantities that can be marketed and the producers might fail for any reason. The price of biodiesel might also be influence as the number of producers is limited to 4 only.

The tax regime

Regarding tax exemption the Belgian government has approved a tax advantage for biodiesel without any burden for the budget. Starting on November 1, 2006, the tax of fuels will remain about the same for diesel that will contain 3.37% biodiesel while the pure fossil diesel tax will be increased by 1.2 Eurocent per litre. The advantage in favour of biodiesel amounts to 35.2 Eurocent per litre (1.2 / 0.0337).

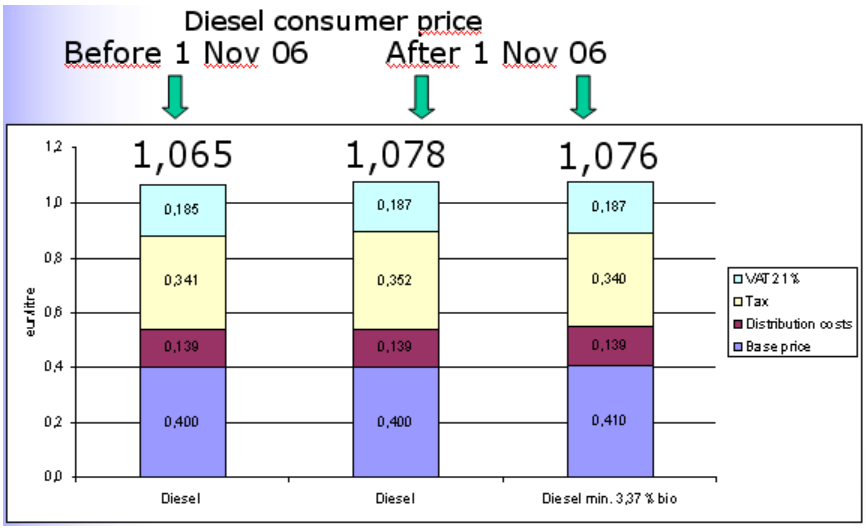

Fig. 3-1 Price of diesel for final consumers before and after November 1st, 2006 in Belgium (Source: Jossart 2006a)

Such tax system is attractive mainly because it does not reduce the State income. Increasing the tax on transportation fuels is also favouring the rational use of energy and CO_2 savings because the fuels becomes more expensive and consumers are supposed to consume less. However it is a pity that the Belgium tax regime does not allow a tax reduction for high blends. Only public transportation companies are eligible for proportional tax reduction when the biofuels content increases.

3.3 Bulgaria

The support of biodiesel production, distribution and consumption represents an important part of the Bulgarian renewable energy policy, as this is specified in the National Long-Term Program for Support of Renewable Energy Applications 2005–2015 [EEA 2005].

Currently existing biodiesel support measures in Bulgaria consist of tax relief and agricultural subsidies.

Since January 1, 2006, in Bulgaria was introduced a zero excise duty rate for pure biodiesel (B100) – according to Articles 32 and 33 of the Law on Excise Duties and Fiscal Storehouses [SG 2005]. This tax relief immediately resulted in a spectacular growth of biodiesel production capacities.

As of January 1, 2007, the new amendments in the Excise Duty and Tax Warehouse Act [SG 2006] entered into force. These changes are in accordance with the European policy for encouragement of production and utilisation of biofuels and introduce the zero excise for motor biodiesel and bioethanol motor fuel.

At present, according to the Renewable and Alternative Energy Sources and Biofuels Act [SG 2007a], producers of liquid fuels for transportation purposes are obliged to offer on the

market oil-based fuels, blended with biofuels in proportion set by the Regulation for the requirements on the quality of liquid fuels.

Other existing support measures, related to biodiesel, are the agricultural subsidies for growing oleaginous crops. Currently the agricultural subsidies for energy crops are BGN 88.501 (45.00 €).

In Bulgaria was officially adopted the European norm for biodiesel EN 14214. Some suggestions exist also for the development of a national norm, more easily achievable characteristics (e.g. iodine number) for biodiesel, produced from sunflower oil.

On January 1, 2007, Bulgaria became a Member State of the European Union and all biofuel requirements and indicative targets of Directive 2003/30/EC and other EU documents became applicable also in Bulgaria.

In order to reach the national indicative targets and in accordance with the regulations of the Renewable and Alternative Energy Sources and Biofuels Act, the government is developing the “National Long-term Program for the Consumption of Biofuel in the Transport Sector” for the period 2000-2020.

When defining the national indicative targets for consumption of biofuel in the country, the indicative objectives set in the Directive 2003/30/EC and the approved by the European Council (March 8-9, 2007) new targets for increasing the share of renewables, treating in particular biofuels, have been considered.

The objectives for biofuels defined in this document are:

an indicative target from 5,75 % for 2010 and

a compulsory minimum target from 10% for all the EU Member States for the biofuel share from the total petroleum and diesel oil consumption for EU transport sector up to 2020 to be reached in an economically effective manner.

It has to be noted here, that the texts on the zero excise duty rate specified in the Excise Duty and Tax Warehouse Act practically does not solve the problem with the biodiesel in Bulgaria. This imposes:

Urgent adoption of texts in the Act, stating that the excise should be reduced proportionally to the quantity of biodiesel, added to the fuel composition.

In order to stimulate the biofuel utilisation in Bulgaria, the proposed by the National Biofuel and Renewable Energy Sources Association actions and measures for active engagement of the governments should be approved, namely:

active awareness raising and popularisation of the biofuel utilisation, by introducing it in the State and municipal transport for own needs;

establish State register (maintained by the Ministry of Economy and Energy) for the biofuel production, thus identifying the producers;

remove the guarantee of 60 Euro per hectare, currently required by the energy crops producers in order to receive the subsidy of 45 Euro per hectare.

The National Biofuel and Renewable Energy Sources Association, with the active support of ESD-Bulgaria and key stakeholders are working to improve the normative framework and remove the still existing barriers.

3.4 Cyprus

The need for meeting the objectives of several Directives of the Commission on European Community concerning the promotion of use and production of biofuels for transportation, led Cyprus Government to issue a number of laws, orders and regulations. Since the accession of Cyprus in European Union (EU) the following legislation has been introduced.

Law N.33(I)/2003: Promotion and exhortation of the use of renewable energy sources (RES) and energy conservation

The Law was introduced in 2003 in order to meet the objectives of the Directive 2001/77/EC on the promotion of electricity produced from RES in the internal electricity market. A special fund, under a committee control, was established and its resources may be distributed according to approved (by the committee) schemes for the:

production or purchase of electricity produced by RES;

development and implementation of programs for the promotion of RES and programs for raising the awareness of general public;

grant scheme. A grant scheme for energy conservation and the utilisation of renewable energy sources is being operated by the Energy Service under Law N.33(I)/2003 since February 2004. The scheme covers a large spectrum of investments in energy conservation, co-generation and utilisation of RES, including the production of biofuels.

Law N.91(I)/2004: Consumption taxation – 9th Part on taxation of energy products and electricity

The Law was issued in 2004 and the specific reference was introduced in order to meet the objectives of the 16th Article of the Directive 2003/96/EC on the application of exemptions or reduced rate of taxation under fiscal control on taxable products as fuels containing components produced from biomass. Accordingly, the Law states that the Ministerial Council has the authority to apply exemptions on the special consumption tax on energy products and electric power.

Under publication Ministerial Order

A Ministerial Order is prepared by the Customs & VAT Department of the Ministry of Economics that introduces the abstraction of excise duty on biofuels. These quantities may be imported (from EU Member States and non EU States) or produced in Cyprus. The excise

duty abstraction will be applied on the volume proportion of biofuel in case of standard Petroleum fuel and biofuel blending.

Ministerial Order KDP 318/2004: Specifications of oil products and fuels

The Ministerial Order was issued in 2004 under the Law on the specifications of oil products and fuels (N.148(I)/2003). Biodiesel is defined as a biologically originated fuel consisted of fatty acids methyl esters (FAME) derived from vegetable or animal oils and it is possible to be used as a biofuel for motor-driven vehicles.

Law N.66(I)/2005: Promotion of the use of Biofuels or other renewable fuels for transport purposes

The Law was introduced in 2005 and adopted the provisions of the Directive 2003/30/EC on the promotion of the biofuels or other renewable fuels for transport. According to this law:

The Ministerial Council defines the indicative national goals for the introduction of biofuels to the market (as for biodiesel the national goal until the end of 2006 was 1%, a goal that was never accomplished since no biodiesel was distributed – legally – in Cyprus). The revised National Goals for the preceding years are the following:

- 2007: 1% on the energy content
- 2008 to 2010: 2.5%

The forms of biofuels that can be introduced to the market are apparently defined.

The distribution and selling of biofuels produced from genetically modified plants is forbidden.

The Minister of Commerce, Industry and Tourism monitors the impacts of the use of biofuels blended with fossil fuels in concentrations higher than 5% in technically non-adapted vehicles.

The Minister shall elaborate multi-annual programmes under the objective of promoting the use of biofuels and other renewable fuels.

Modification Bill of N.66 (I)/2005

The Energy Service of the Ministry of Commerce, Industry and Tourism prepared a bill to amend the above Law in order to apply tax exemptions (0% consumption tax) to biofuels marketed in Cyprus. The bill has been vetted by the Attorney General and has been submitted to the Council of Ministers and was approved by the Directorate General for Competition on the proposed tax exemptions.

The crucial component of this Modification Bill is the introduction of the Multi-annual programme under which the tax exemption for the Biofuels will take place. The Bill is still pending since it was rejected by the House of Representatives of the Republic Cyprus. The reason of the rejection was the absence of a provision on the prohibition of importing and distributing biofuels produced from genetically modified plants (GMO's).

Law N.174(I)/2003: Motor-driven vehicles

In order to promote the use of Flexible Fuel Vehicles in Cyprus the Registration Fee and the Annual Road Taxes were set at very low rates, 50% of the petrol and diesel driven vehicles fees, or CYP 50 (≈ 85.5 €) and CYP 10 (≈ 17.1 €), respectively.

Comments

The accession of Cyprus in the EU can be characterised as legislatively premature and therefore the relevant legislative framework is under continuous modulation that adapts to the goals of EC Directives directly but not adequately. The above mentioned laws adopt all the proposed regulations but they do not comprehend specific limits (e.g. quotas, level of tax reduction, etc.). The vagueness that is imposed does not allow the companies wishing to set their hand on the emerging biodiesel market to shape their commercial policy since the cost prediction is, until now, impossible. It is apparent that there is a significant lack of relevant experience and technical knowledge on the part of the governmental departments that intervene to the specific market framework, which leads to serious delay and inefficient actions.

The rejection of the Modification Bill of the Law N.66 (I)/2005 stalls the whole biofuel market in Cyprus since there is no possibility of implementing the necessary for the tax exemption procedure multi-annual programme. The Energy Service of the Ministry of Commerce, Industry & Tourism will try once again to present the modification bill in the House of Representatives hoping that the objections about GMO's will be deviated.

The publication of the Ministerial Order about the introduction of the excise duty exemption even though it was not enough for the initialisation of market actions (of the biofuel market) appointed the use of biofuels (including biodiesel) as legal since until its publication this use was considered illegal.

3.5 Greece

Greek law on the promotion of biofuels

Following the EU Directive 2003/30, the Greek government has launched in 2005 a new law L 3423/05 (ΦΕΚ 304/A/13.12.2005) for the introduction of biofuels. According to this, biodiesel is the main biofuel for the Greek transport sector while bioethanol is expected to be introduced to the market in 2008.

The current law imposes the obligatory use of all detaxed biodiesel in the existing refineries (in an up to 5% blend). The detaxed quantities are decided on an annual basis under a quota scheme. Law 3340/05 (Article 34) states that the detaxed biodiesel quantities are 91,000 m³ (71,851 tonnes) for 2006 and 114,000 m³ (97,695 tonnes) for 2007, while no detaxed quantities have been announced so far for bioethanol.

The detaxed biodiesel quantities are presented in the Table 3-1.

Table 3-1 Estimated biodiesel requirements. In 2005 only 420 tonnes biodiesel were produced while in 2006, 51,545 tonnes were produced and delivered to the refineries for blending.

Year	Estimated automotive diesel consumption **(thousands of tonnes)**	Biodiesel used **(%)**	Biodiesel required **(tonnes)**
2005	**2,084**	**2,00**	**46,976**
2006	**2,125**	**3,00**	**71,851**
2007	**2,167**	**4,00**	**97,695**
2008	**2,208**	**4,50**	**111,986**
2009	**2,249**	**5,00**	**126,739**
2010	**2,290**	**5,75**	**148,407**
			Source: YPAN 2004

Greek Law on the promotion of investments

As part of the national strategy to promote biofuels, any investment in the field is subsidised from the Law 3299/04 ("National Development Law") on promotion of investment. Subsidies vary from 40–55% according to region, and the type of the enterprise (in case of SME's and specific regions they can reach up to 55%) [ELKE 2004].

The "Greek Operational Programme for Competitiveness" is active until the end of 2006. Support on capital cost (up to 40%) for biodiesel plants was included in the 3rd Community Support Framework (Energy). The 4th Framework is under development and respective provisions are expected to be put forth.

3.6 Poland

In Poland, a number of regulations are determinants of the policy regarding biofuels and especially biodiesel. In this context, one main act and several other regulations are essential.

The main act is

the Act of August 25, 2006 on biocomponents and liquid biofuels. It implements the resolutions of the Directive 2003/30/EC of the European Parliament and of the Council of May 8, 2003 on the promotion of the use of biofuels and other renewable transport fuels.

The other regulations which are to be taken into account are listed in the following:

Regulation of the Government of January 12, 2004 on course of calling, work and number of members of the Commission on biocomponents used in liquid fuels and liquid biofuels

Regulation of the Minister of Agriculture and Rural Development of January 6, 2004 on definition of accredited certificating units and accredited research laboratories

Regulation of the Minister of Agriculture and Rural Development of January 6, 2004 on issuing of biocomponents quality certificates and course of stating in cases of biocomponents quality by the accredited certificating units and accredited research laboratories

Regulation of the Minister of Economy and Labour of March 10, 2004 on labelling gasoline pumps for liquid biofuel sale including esters existing as self-contained engine fuel

Regulation of the Minister of Economy, Labour and Social Policy of March 19, 2004 on quality requirements for biocomponents – bioethanol and quality examination methods for biocomponents – bioethanol

Act of January 23, 2004 about monitoring and controlling systems of liquid fuels and liquid biofuels quality (amended)

Regulation of the Minister of Finance of April 26, 2004 amending the regulation on excise duty exemptions with amendments [PMF 2004]. According to the latest (May 2007) changes in this Regulation the following products are exempted from excise duty [PLG 2007]:

- diesel fuel containing more than 2% of biocomponents – in the amount of PLN 1.048 (approx. 0.28 Euro) per litre of biocomponents added to these fuels,
- pure biodiesel – not a complete exemption from excise duty on the sale of these fuels but a reduction to PLN 0.01 (approx. 0.0027 Euro) per litre.

According to the latest law on excise duty exemptions approved by the President on May 30, 2007, subsidies equal to 45 Euro per hectare of rapeseed were received by farmers from EU funds. The law also imposes penalty for not adding biocomponents for fuels.

Regulation of the Minister of Economy of July 6, 2007 on biofuels Indicatory National Targets for 2007-2013

Biofuels policy

The first policy for biofuel in Poland is preparing by The Polish Ministry of Economy the “The Long-Term Program Of Promotion The Biofuels or Other Renewable Fuels for 2008-2014”. This document was adopted on July 24, 2007. Poland’s rates of biofuels use are set as follows in Table 3-2:

Table 3-2 National targets for biofuels use – share based on energy content

Year	Share based on energy content
2007	**2.30%**
2008	**3.45%**
2009	**4.60%**
2010	**5.75%**
2011	**6.20%**
2012	**6.65%**
2013	**7.10%**
2014	**7.55%**

Source: PME 2007b

The Long-term Program for Promotion of Biofuels or Other Renewable Fuels for 2008-2014 is focused on use of biofuels and increasing demand for biofuels. One of the premise of this document are: parking charge exemption for cars using biofuels, creation of limited areas in cities opening only for public buses using biofuels, as well as environmental tax exemptions for enterprises using cars and other vehicle, and machinery using biofuels.

3.7 Romania

In the conditions of Romania is joining to the EU in 2007, the country assumed the strategic objectives in renewable energy resources field. The most important document is the Directive 2003/30/EC [EPC 2006a] on the promotion of the use of biofuels or other renewable fuels for transport. The Directive stipulates that until 2010, the biofuel will replace diesel and gasoline up to 2% in 2005 and 5.75% by 2010.

The Directive 2003/30/EC has been already included in the national legal frame throughout the Government Decisions: HG-1844/2005 that stipulates that the biofuel will replace diesel and petrol up to 2% by 2007, date of Romania's accession to EU and 5.75% by 2010.

Mandates

A new legislation has been adopted in May 2007 (Government Decision no 456/2007, published in the Official Monitor no. 345 from May 22, 2007). It modifies Decision no. 1844/2005 to provide for the gradual introduction of mandatory targets (by volume):

- from July 1, 2007: 2% biodiesel
- from January 1, 2008: 3% biodiesel
- from July 1, 2008: 4% biodiesel
- from July 1, 2009: 4% bioethanol

Governmental Decision 456/2007 also introduces a new article 12 indicating the level of sanctions in case of failure to blend in the above-mentioned proportions: a fine between 7,500 and 15,000 Lei will apply.

Quota

At present, no quota for the production of biodiesel applies in Romania.

Direct subsidies

The Romanian State gives farmers 50 Euro per hectare in subsidy, in addition the EU 45 Euro/ha grant for growing energy crops.

Detaxation schemes in favour of biodiesel

In order to implement the Energy Taxation Directive 2003/96/EC [EPC 2006b] has been already included in the national legal frame throughout the Law 571/2003 of the Romanian Code Fiscal (Law 571/2003) which provides for unconventional biofuels, only for biodiesel, which is excepted from taxes, transposing the prevision of Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity (OJ L 283, 31.10.2003).

Within the Romanian Fiscal Code (Law 571/2003), the non conventional biofuels (biodiesel) are exempted from taxes.

A New Fiscal Code (Law 343/2006) is applying as from January 1, 2007. The Law 343/2006 in its 201 article gives a full detaxation for biodiesel. The full exemption from the excise tax applies only for the FAME content. The Ministry of Economy and Trade and the Ministry of finance are working in collaboration with Petrom, Lukoil and Rompetrol on methodology norms regarding biofuel tax exemption in the new code fiscal.

In July 2007, the excise on conventional diesel was RON 918,938 (= 260 €).

Transposing the standard EN14214 [CEN 2003] as national standard – SR EN 14214.

Supplementary

As the transport is a significant source for air pollution, we mention in this context, the legislation regarding the air quality:

For the transposition of the Directive 2003/69/EC relating to limit values for benzene and carbon monoxide in ambient air, the following legal acts were adopted: Order of the Minister of Waters and Environmental Protection No. 745/30.08.2002 (OJ 739/09.10.2002) establishing the agglomerations and the classification of the agglomerations and of the areas for the assessment of air quality in Romania and Order of the Minister of Waters and Environmental Protection No. 592/25.05.2002 (OJ 765/21.10.2002) for the approval of the Norm establishing limit values, threshold values and criteria and methods of assessment of sulphur dioxide, nitrogen dioxide and nitrogen oxides, particulate matter, (PM10 and PM2,5) lead, benzene, carbon monoxide and ozone in ambient air.

For the implementation of the provisions of Directive 94/63/EC on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations, a calendar was established for the elaboration of compli-

ance programmes for the small installations for which transitional arrangements had been requested.

Government Decision GD No. 142/6.02.2003 relating to the sulphur content limitation of liquid fuels (OJ No. 112/21.02.2003), which transposes Directive 1999/32/EC relating the reduction of sulphur content of liquid fuels, has been adopted. The Ministry of Industry and Resources is the responsible authority for establishing the follow-up and compliance system for the sulphur content from crude oil and diesel oil, used in economic units or placed on the market.

Deliverable 15
Review of sectors involved in biodiesel market chains

4 Raw material supply

4.1 Belgium

Players

In Belgium the area of arable land is 800,000 hectares. Main crops are cereals, sugar-beet, maize and potatoes. Farmers are generally not organised in cooperatives (except SCAM in Wallonia). Rapeseed is collected and stored by private companies (Walagri, SCAM, AVEVE and several (small) independent collectors, all federated by SYNAGRA). These companies buy and sell cereals and rapeseed on the world market, at times through specialised traders.

Regarding the production and refining of the oil, Cargill is the main (and almost only) player in Belgium with large capacities in harbours of Antwerp and Gent and several other locations. A new investment in a crushing plant of 300,000 tonnes is planned specifically for the supply to biodiesel plants.

Rapeseed potential

Rapeseed is cultivated on set aside land in Belgium almost since the beginning of the set aside regime. It has always been sent abroad physically of through certificates. The surface evolved according to the set aside percentage and the price and ranged between 1,000 and 9,000 hectares. The total rapeseed area is now close to 10,000 hectares in Belgium. The energy crop scheme does not increase the rapeseed area but it substitutes food crops.

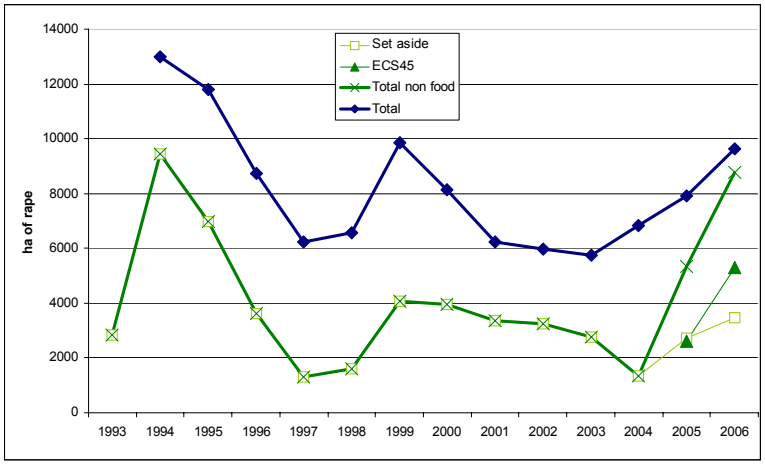

Fig. 4-1 Evolution of rapeseed area, total area and non-food area on set aside and energy crop scheme (Source: ValBiom 2007)

According to several sources the rapeseed area could double mainly depending on the price and competitiveness with other crops (wheat is now proposed on set aside). In any case the potential of rapeseed in Belgium is by far insufficient to cover the demand and import is necessary.

4.2 Bulgaria

When biodiesel production started in Bulgaria in 2001, it was first based on waste cooking oil. Yet, since the beginning of 2006, there is a rapid growth of biodiesel production and most of it is already based on sunflower or rapeseed oil. Of course, a substantial part of sunflower and rapeseed quantities continue to be used for the production of cooking oil.

According to [Hristova 2006], the theoretical potential for collection of waste cooking oil from restaurants and cafeterias amounts to about 8,000 tonnes annually.

Some statistical information about the sunflower seed and rapeseed harvests during the period 2001-2006 are presented in Table 4-1 and Table 4-2. The low average yield in 2003 most probably was due to freezing of the crops during winter.

Table 4-1 Sunflower seed harvests in Bulgaria during the period 2001–2006

Year	Harvested area **(ha)**	Average yield **(t/ha)**	Harvested quantity **(t)**
2001	**389,700**	**1.040**	**405,087**
2002	**427,838**	**1.400**	**599,551**
2003	**659,631**	**1.200**	**788,763**
2004	**592,785**	**1.820**	**1,078,832**
2005	**653,371**	**1.470**	**934,855**
2006	**753,200**	**1.590**	**1,157,000**
			Source: JICA 2006

Table 4-2 Rapeseed harvests in Bulgaria during the period 2001–2006

Year	Harvested area **(ha)**	Average yield **(t/ha)**	Harvested quantity **(t)**
2001	**16,700**	**1.130**	**19,000**
2002	**6,901**	**1.170**	**8,061**
2003	**12,687**	**0.890**	**11,291**
2004	**11,250**	**1.99**	**22,388**
2005	**10,993**	**1.98**	**21,778**
2006	**16,500**	**1.80**	**28,000**
			Source: JICA 2006

It should be noted here that sunflower is traditionally grown in Bulgaria. Concerning rapeseed, it was first cultivated in the 19th century, but only in small quantities. Larger scale cultivation started again from about 10 years ago. However, there are still some problems, due to

climatic conditions and other reasons (e.g. rapeseed needs a lot of humidity in September, there are freezing hazards during winters in Bulgaria, etc.).

According to [BMAF 2007a], the average sunflower and rapeseed prices in 2005 were:

sunflower seed: BGN 402 (205.54 €) per tonne;

seeds of rapeseed crops: BGN 405 (207.07 €) per tonne.

An interesting calculation is provided in [JICA 2006], concerning the additional needed agricultural land area needed to meet the indicative target for a share of 5.75% biofuels in the overall fuel consumption for transport purposes. Based on 2004 transport fuel consumption in Bulgaria, this percentage corresponds to an overall amount of 104,075 tonnes of oil equivalent annually (toe/yr). With the assumption of a proportional distribution of biodiesel and bioethanol percentage respectively to the 2004 consumption of diesel oil and gasoline, the 2010 indicative target for consumption of biofuels would be as follows:

biodiesel: 70,265 toe/yr (which corresponds to 79,500 t/yr);

bioethanol: 33,810 toe/yr (which corresponds to 53,000 t/yr).

With the current yields, the additional agricultural areas, needed for cultivation of the corresponding quantities of sunflower and of wheat would amount to 207,230 hectares, which is about 45% of the currently non-cultivated agricultural land [JICA 2006].

The producers of sunflower seeds and rapeseed seeds in Bulgaria are of 3 categories:

tenant farmers,

agricultural co-operatives,

farmers that work on their own land.

In the absence of specific statistics, concerning sunflower and rapeseed cultivators, it is interesting to quote some general statistics, concerning the structure of land ownership in Bulgaria. According to [BMAF 2007a], the average size of agricultural properties is quite small: 0.64 hectares. However, due to the leasing of land by tenant farmers, the percentage of farms with cultivated area more than 50 hectares is quite high – 78.5%. Most probably, in the case of sunflower and rapeseed growing, the farms with such activities and cultivated area above 50 hectares have a still higher percentage.

It is interesting also to note that agricultural activities correspond to about 24.9% of the overall employment in Bulgaria [BMAF 2007a].

In the typical case, the cultivation of sunflower and rapeseed for biodiesel production is initiated and organised by biodiesel producers. A good example in this respect is the company Ecoproecti OOD in Dimovo (North-Western Bulgaria). As described in [Georgiev 2006], this company constructed a biodiesel plant in a an area that previously had a very high rate of unemployment (more than 35%). Some additional activities included distribution to local farmers of high quality seedlings and cultivation of a company owned experimental field with the aim to achieve higher yields. The greater demand for sunflower and rapeseed resulted also in an increase of about 60% of local prices of agricultural land.

The Bulgarian Association of Farmers acts as a branch organisation of agricultural producers.

4.3 Cyprus

The major parameter that shapes the emerging biodiesel market in Cyprus is the scarcity of cultivable land and water. These significant factors impose that the biodiesel production will rely mainly on imported raw material since the primary production is nearly impossible. It was inevitable that the Cypriot farmer's organisations until now are not highly interested on energy cultivations, whereas this delay-lack of interest was also enforced by the government. The Ministry of Agriculture, Natural Resources and Environment recessed the elaboration of a law that would introduce a grant scheme for the financial support of farmers that wish to replace their current cultivation by energy plants. It was obvious that the great problems that would be confronted if the primary production was enforced turned back every relevant effort.

Nevertheless, measures to promote indigenous production of biofuels are being undertaken by means of research programmes. Specifically, a grant aid of CYP 136,000 (≈ 232.560 €) has been provided by the Research Promotion Foundation of Cyprus for the preparation of a study on the evaluation of energy crop potential in Cyprus. The ongoing project is aiming at investigating the feasibility of some crop-species as energy plants on the basis of experimental cultivations. Within the framework of the project, bioethanol and biodiesel will be produced in order to evaluate their quality and their energy content. The project is being contacted by the Cyprus Institute of Energy, the Agriculture Research Institute and the National Technical University of Athens. The project was launched in 2004 and the final results will be announced in 2007.

Taking into account the inability of primary raw material production in Cyprus, the main players of the market believe that the biodiesel quantities that will be distributed, in the near future, will probably come from three alternative sources:

imported seeds and unprocessed vegetable oils,

used vegetable oils,

imported pure biodiesel and diesel-biodiesel blends.

Imported seeds and unprocessed vegetable oils

A major oil-processing company of Cyprus (Ambrosia Oils Ltd.) has already established a biodiesel production installation which will be fed by vegetable oil that will be directly imported or derived by the processing of, also imported unprocessed oil seeds. The type of oil/oil seeds will be chosen taking into account the current prices of these products over the world oil market. The already installed system has a capacity (8,000 t/yr) adequate for the satisfaction of the national goal for 2006 (approx. 6,500 t/yr).

Used vegetable oils

Even though there is no significant research about the exploitation of used oil for biodiesel production in Cyprus there was until now several small scale trial production plants. The significant number of “used oil producing” enterprises, e.g. hotels and restaurants, present on the island vouches for the presence of an important raw material source that needs to be adequately evaluated.

Imported unblended biodiesel and diesel-biodiesel blend

The representatives of the four major petrochemical products distribution companies of Cyprus, taking into account the urgent need for immediate of biodiesel introduction to the fuel market (the national indicative goal of the preceding years was not accomplished) and the inability of domestic primary raw material production, really believe that the biodiesel distributed in Cyprus will probably come from imported quantities. The three of these companies are members of broader petrochemical groups that are able to export to Cyprus the requested quantities. There are two options about the way that these quantities will be imported, either as a diesel-biodiesel blend or as pure biodiesel.

The distribution of biodiesel implies the emergence of several technical problems that need to be confronted via the adaptation of the installations. The oil distribution companies wish to proceed to these adoptions but the delay of the legislative framework implementation does not allow them to reliably evaluate the relevant cost analysis since there is no established commercial (e.g. quality control, taxation, way of national goal imposition etc.) framework.

The motive that runs until now the biodiesel market in Cyprus is the oncoming penalties from EU due to the delay of introducing the alternative fuel to the commercial fuel chain. This factor misleads the main market actors (oil companies) that believe that all the policy and technical issues must be confronted by the government since they will be forced to distribute biodiesel without this being their own choice.

4.4 Greece

Indigenous raw material for biodiesel production comprises of sunflower oil, soybean oil and cottonseed oil. The harvested area in 2005 was 23,000 hectares, with 33,000 tonnes respective seed production, while in 2005 the harvested area of sunflower was 8,000 hectares with 16,000 tonnes respective production. The harvested area of soybean in 2005 was 2,000 hectares and the production was 4,000 tonnes [FAO 2006]. The cotton harvested area in 2005 was 375,000 hectares and the production was 1.1 million tonnes. About 52% of this (570,000 tonnes) is the seed production.

During the last two years (2006-2007) the raw materials used by the Greek biodiesel production units comprise about 70-80% imported oils (rapeseed, soy bean, etc.) and about 30% domestically produced oils (cotton-seed, sunflower, used cooking oil, etc.), a percentage that is expected to increase up to 39%, according to the projections announced by the Hellenic

Ministry of Rural Development and Food. Attempts to intensify domestic sunflower and oilseed rape crops are on the increase, with a view to domestically produced raw materials exceeding imports.

Based on records from the seed producing companies BIOS AGROSYSTEMS and SYNGENTA almost 1,500 hectares of rapeseed have been cultivated during the 2006-2007 period mostly in central and northern parts of Greece.

Table 4-3 presents the cultivated rapeseed varieties in Greece during 2006-2007.

Table 4-3 Rapeseed varieties and hybrids cultivated in Greece

Seed companies	Varieties/ Hybrids
SYNGENTA	**Fortis, Royal, N.K. Bravour, Recital**
PIONEER	**PR 46W31, PR 45D01**
TSOTSIOS	**Vectra**
PETSAS	**Aviso**
BIOS	**Californium, Exact, Executive**
UNKNOWN	**Licapo, ES Betty, Licord**

Source: CRES 2007

In addition to this, the Minister of Rural Development and Food has announced in February 2007 [MINAGRIC 2007] that during 2007:

- approximately 73,000 tonnes of indigenous oil seeds (mainly comprising of 69,000 tonnes of cotton seeds) will be used for biodiesel production.
- In addition, 11,200 ha of agricultural land will be cultivated with energy crops, under contractual schemes, for biodiesel production.

4.5 Poland

Polish Association of Rapeseed Producers (KZPR)

KZPR is a voluntary, autonomic, professional and independent organisation, which represents and defends oilseed growers' rights and interests against public authorities, oil-processing plants, and purchase, scientific, social and economic units and other subject acting in the agricultural sector. It was established in the year 2000 with nationwide range.

The principles of the KZPR policy are:

global participation of rapeseed growers in KZPR;

profitable rapeseed production in Poland;

stabilisation of the rapeseed branch for instance founding the Polish Rapeseed's Council;

self-sufficiency in vegetable protein production in Poland and EU by the increased rapeseed production and the utilisation of oil surplus in the technical usage;

participation of agricultural producers in the process of obtaining biofuel from rapeseed.

National Council of Agricultural Chambers

The legal foundation of the agricultural self-government in Poland is the Act of December 14, 1995 on Agricultural Chambers (as published in the Journal of Laws of 2002, No. 101, item 927 and No. 113, item 984), which was enacted on April 5, 1996.

As provided by the Act on the Agricultural Chambers, members of the agricultural self-government are private and legal persons who are agricultural tax payers, individual income tax payers from special branches of the agricultural production and members of the collective farms possessing land inputs in these cooperatives.

Organisational units of the agricultural self-government are agricultural chambers, which have a legal status. The Chambers act on the territories of the voivodships. Their organs are:

General Meeting – the highest constitutive body of the Chamber, taking decisions on the most important matters

Management – an executive body of the Chamber

Revisory Commission – constitutes the internal audit body, especially in the scope of financial management

Powiat Councils of the Chamber – Powiat organs of the Agricultural Chamber, which act on the territory of a Powiat, carry out tasks of opinion-giving and counselling character in aid of other organs of the chamber

A consultative and advisory role to the General Meeting is performed by task commissions appointed from the members of the Meeting. Their panel may be enlarged by persons from outside of the Meeting, but by no more than 50%.

The widest representation of the agricultural environment is currently the agricultural chambers, constituting, in virtue of law, the agricultural self-government. They perform opinion-giving and counselling role with reference to planned legal resolutions of agricultural and rural issues.

Polish Federation of Crops Producers (KFPZ)

Polish Federation of Crops Producers is a political, self-financing agricultural organisation, which represents interests of Polish crops producers. It fights economical, social and cultural rights of its members.

The members of the Federation are:

agricultural trade associations,

Commercial Law Company,

agricultural cooperatives,

groups of producers and

family farms.

The main goals of the Federation are common activities, which consolidate and stimulate the members of the organisation and other agricultural entities dealing with crops productions as well as active role in preparation of the economy policy assumptions in the fields interesting for Federation members, in particular:

initiation of the activities on assurance of the quality and profitability of crops production;

initiation and realisation of organisational and economical undertakings being in the common interest of KFPZ members, in cooperation with other institutions and organisations, by undertaking among other things model production and trade business and promotion of such activities;

development of common methods of activity in form of consultation and advices for internal need and goals of the member organisations using well-known methods in European Union taking into account the special conditions of Polish market and conservation of the polish agricultural culture.

4.6 Romania

Today in Romania, there is practically the beginning of local production for biodiesel purposes, including a rather modest quantity of exported rapeseed. However, the potential for a future biofuel raw material production is high and may come from different approaches regarding land and production availability.

Re-conversion to biofuel production of a part of the habitual production and use of raw materials

The information presented above regarding production of different agricultural raw materials as oleaginous plants, sugar and starch crops, already existing on the market for other purposes than biofuel production, are relevant as it shows the efficiency, capability and experience to manage this kind of crops. This information constitutes the starting point for further consideration on biofuel raw material production.

Rapeseed production

As mentioned above, the large majority (90%) of rapeseed production is exported, while the remaining rapeseed and rapeseed oil production is used in Romania for other purposes than biofuel (textiles and chemistry). USDA FAS informs that Romania exported 85,000 tonnes of rapeseed in EU (Germany, Denmark and Sweden) in 2001/2002. It is not known the use of the exported rapeseed in EU, but most probably it is processed for biofuel production.

The rapeseed cultivated area and production have a continuous increasing trend. Currently, we may consider that over 100,000 tonnes of rapeseed production are exported for biofuels production purposes.

Stimulated by an increasing demand for rapeseed oil for biodiesel production, farmers planted in the fall of 2005 over 175,000 ha with this crop, but extensive winterkill reduced the cropland area to just 90,000 ha. Yields on the area that survived are also expected to have been affected by the long and cold winter (especially in terms of plant density per hectare). Over 12,000 ha were planted by mid-May with spring varieties of rapeseed.

Although sunflower seed prices have constantly depreciated throughout 2005/2006 compared to the previous marketing year in Romania, national authorities expect an increase in that areas planted with this crop. Official statistics released in the first week of May 2006 by the Romanian Ministry of Agriculture, Forests and Rural Development indicates that sunflower seed plantings made up 486,000 ha.

Increase of agricultural production intensity

One of the most important sources for land and production availability will come from the increase in the production efficiency.

Today, approximately 9.3 million hectares agricultural land is owned by 4,170 individual households, which fragments the ownership on land. Currently, cereals use nearly 37% of the utilised agricultural area. The area used for maize is largest with 56% of cereals area in 2006, followed by wheat with a share of 35.5%.

The next most important crop by area utilised is sunflower, with an area of about 900,000 hectares. Arable production intensity is likely to go up, leading to higher yields per hectare and increased use of fertilisers and pesticides. The productivity increase may be about 3% per year. This trend is the response to a more stable agro-economic environment, and the gradual introduction of modern technology and machinery. The efficiency of production is much lower than in the EU countries. As example, for cereal yields the EU-15 reference is 4.77 t/ha, while in Romania the average is 3 t/ha. Regarding the oil, sugar and starch crops, the efficiency in Romania is even 50% lower than in EU countries. Considering that the production level is kept at the 1998-2002 level, the improvement of productivity means that less land is needed for the same production and an important land area will become available, including for biodiesel production purposes.

A general estimation made by the Research Institute for Soil Science and Agrochemistry shows that of the total agricultural land resources, about 3.7 million hectares represent arable land of good and very good quality. If intensively cropped, this area could be the basis (approx. 0.17 ha per capita) for ensuring the food security of the country population and to allow conversion of the remaining area of arable land (approx. 5.6 million ha) to other uses.

These other uses may be mainly grassland or forestland (those strongly degraded, one estimates that at least 1 million hectares of agricultural land have to be afforested/reafforested), but biodiesel raw resources crops may be considered here as well.

Following the above estimation we consider that, following the increase of production efficiency, up to 1,000,000 hectares may become available for other purposes (including biodiesel raw material production) by 2010.

Engaging part of the today not-used agricultural land

It is estimated that the amount of uncropped arable lands varies from year to year between 5 and 10% of the total farmland. It includes not only degraded or marginal lands, but also important areas of high quality lands whose holders do not crop due to different reasons: aged persons, decapitalisation, especially lack of agricultural equipment for tillage or for other agricultural works, or simply because of the low income that can be obtained by agricultural activities.

Through land restitution, an important share of the agricultural land (between 30 and 40%) according to different estimates was allocated to the owners that do not activate in agriculture (city dwellers and rural pensioners), who are not interested to cultivate directly the land.

As example, in 2003 in comparison to 2002, the area cultivated with cereals decreased with 496,000 hectares, which represents some 5% of the arable land.

In general it may be considered that from the 9.3 million ha of arable land, the non-cultivated land totals between 0.9 million and 1.4 million hectares.

Summing the above consideration on land and production availability for biofuels raw materials purposes, it may be considered that currently the existing potential is:

90,000 ha formerly used for sugar beet production

85,000 ha rapeseed cultivation area

1 million ha available arable land, presently uncropped

1 million tonnes of agricultural and forestry residues

There is a high reserve for this potential to increase in the near future, as the available land resulting from higher production intensity may reach another 1 million hectares by 2010. The total figure of about 2.2 million ha available land around 2010 for non-food crops is confirmed also by subtracting the arable land area agreed within the Agriculture chapter, 7 million ha, from the total arable land, 9.3 million ha.

5 Biodiesel producers

5.1 Belgium

Due to the call for tenders in Belgium, the biodiesel producers are known (name of company, location, received quota).

The first call (regarding quantities to be marketed from September 1, 2006 to September 30, 2007) lead to the following Table 5-1:

Table 5-1 Name, location, quota and capacity of each biodiesel producer

Plant, location	Quota **(t)**	Capacity **(t)**
Oleon, Gent	**63,360**	**100,000**
Neochim, Feluy	**110,000**	**200,000**
Proviron, Ostende	**42,522**	**120,000**
Flanders Biofuels, Gistel	**35,798**	**-**

Source: Jossart 2007

The plant of Flanders Biofuels in Gistel has burnt during the winter 2006-2007. We have no information about the possible renovation of the installation. Moreover, this plant has received a quota for the first period only, which ends in September 2007. We don't know if this quota will reallocated or not if the plant is unable to deliver it.

The second call (regarding quantities to be marketed after October 1, 2007) delivered these results:

Bioro in Gent: quota of 164,750 tonnes per year , capacity of 250,000 tonnes

Proviron in Gistel : 42,800 t/yr

Neochim: 108,267 t/yr

Oleon: 64,000 t/yr

In September 2007, 2 biodiesel plants produce biodiesel in Belgium: Neochim and Oleon. Proviron should begin biodiesel production by the end of 2007.

Oleon has provided 1,128 tonnes of biodiesel to the oil company Total in 2006, for the Belgian market. Neochim expects to deliver between 110,000 and 130,000 t of biodiesel on the Belgian market. Proviron expects to sell about 2/3 of its biodiesel production abroad.

Fig. 5-1 Neochim plant in Feluy (capacity 200,000 t/yr)

5.2 Bulgaria

Biodiesel production started in Bulgaria in 2001, at the plant of SAMPO AD in Brussartzi (North-Western Bulgaria), with a capacity of 3,000 tonnes per year The feedstock consisted mostly of used cooking oil, collected from restaurant chains. In addition to operating this plant, SAMPO AD is also a producer of biodiesel plant equipment.

Another Bulgarian biodiesel plant equipment producer is the company M Engineering. This producer has supplied equipment for several plants in Bulgaria, for a plant in Jalgava, Latvia (5,000 t/yr) and is currently installing a biodiesel plant in Romania. Two other producers of biodiesel are the companies Gamakol EOOD (Plovdiv) and Bioenergomach (Aksakovo).

In recent months, many new plants have started operation – e.g. the newly constructed plant in Dimovo, close to Vidin, with a capacity of 7,000 tonnes per year, belonging to the company Ecoproecti OOD, and several other new biodiesel producers (in the areas of Plovdiv, Rousse, Dobrich, etc.). It is difficult in the moment to obtain precise information about the output, the capacity and even about the exact number of biodiesel plants in our country. Some recent press publications [Hristova 2006] estimate the overall number of biodiesel plants in Bulgaria to have reached 100. According to [Andonova 2006], the biggest plants already in operation are as follows:

Green Oil OOD (in Silistra), with a capacity of 15,000 t/yr

Nora AD (in Lovech), with a capacity of 30,000 t/yr

Klas Olio OOD (in Dobrich), with a capacity of 30,000 t/yr

A second plant of Green Oil OOD is being constructed in Pleven (with a capacity of 30,000 t/yr). Some future projects concern the construction of a plant in Provadia by the company Slunchevi Luchi EAD – with a design capacity of 100,000 t/yr and of a plant in Vidin, planned by the company Eco Petroleum OOD – with a design capacity of 200,000 t/yr [Andonova 2006].

Several of the above biodiesel and equipment producers participate in the National Association for Biofuels and Renewable Energy Sources in Bulgaria. It is interesting to note that several biodiesel producing companies have previous experience in producing cooking oil (e.g. Green Oil OOD, Klas Olio OOD, Sluchevi Luchi EAD). A branch organisation representing nearly all Bulgarian producers of cooking oil is the Oilseed Oil Producers Association Bulgaria.

5.3 Cyprus

Due to the absence of a fully formatted and functional legislative framework there is no biodiesel commercial distribution in Cyprus. The major vegetable oil processing company Ambrosia Oils Ltd. (mentioned above) has already installed a biodiesel production system, with a capacity of 8,000 tonnes per year, which is under trial function. The produced biodiesel quantities are stored. The raw material is mainly unprocessed soybean oil. The small scale producing installations are focused on the processing of used vegetable oils.

Apart of Ambrosia Oils Ltd. three more biodiesel production companies had applied during 2007 to the producers/importers record (in which all the producers/importers have to be recorded in order to achieve the excise duty exemption). These are:

Horizon Biodiesel Ltd. (Based in Paphos),

Strat Bioenergy and

Environmental Energy Ltd. (Based in Lemesos).

The only available data concerns the potential capacity of Horizon Biodiesel Ltd. which will be (after the construction of the plant) approximately 3,000 t/yr. The raw material will be imported vegetable oils (of various types) and used (fried) vegetable oils.

These quantities will be distributed through the major Cypriot petrochemical distribution companies the sale managers of which believe that the vast majority of the biodiesel quantities distributed in Cyprus will come from imported biodiesel or diesel/biodiesel blends.

5.4 Greece

The first domestic biodiesel production plant, operated by Hellenic Biopetroleum Industrial and Commercial S.A. at Kilkis in northern Greece with an annual production capacity of 40,000 tonnes, started operating in December 2005. A second biodiesel production plant,

operated by VERT OIL S.A. in Thessaloniki with an annual production capacity of 25,000 tonnes entered production on July 2006; a third plant, operated by Pavlos N. Pettas Industrial and Commercial S.A., with an annual production capacity of 50,000 tonnes, and same start production date. A fourth plant, with an annual production capacity of 200,000 tonnes, by Agroinvest S.A. at Fthiotida, central Greece started production on November 2006 and a fifth one with an annual production capacity of 80,000 tonnes, by Elinoil S.A. at Volos started operation in December 2006.

Table 5-2 Quota distributions per biodiesel producing company for 2006 & 2007

Company	Quota 2006 (t)	Quota 2006 (t)	Quota 2007 (t)
P.N Pettas S.A, Patras		**20,280**	**26,195**
Vert Oil S.A, Thessaloniki		**6,760**	**7,605**
Biodiesel Ltd, Thessaloniki		**1,268**	**2,958**
ELVI-Hellinika Viopetrelaia S.A, Kilkis	**2,113**	**34,645**	**26,195**
Agroinvest S.A, Fthiotida		**4,225**	**9,718**
Ekkokistiria-Klostiria B. Ellados S.A, Xanthi		**254**	**2.535**
Milloi Soya S.A, Attica (importer)		**3,380**	**0**
Bioenergia Ltd, Xanthi, Xanthi		**254**	**0**
Staff Colour S.A, Larisa		**507**	**4,225**
Mil Oil Hellas S.A, Kilkis		**254**	**676**
ELIN Biokafsima S.A, Volos		**4,225**	**6,760**
B.K.Biodiesel Ltd, Thessaloniki		**338**	
Afoi S.ATrouloi, Heraclion- Crete		**85**	
Bioenergia – Biokafsima S.A, Attica (importer)		**423**	
ETB Biokafsima S.A (importer)			**3,380**
Biodiesel S.A (importer)			**1,690**
DP Lubricanti SRL (importer)			**3,380**
Bioenergia Papantoniou S.A, Halkidiki			**1,014**
Total	**2,113**	**76,895**	**96,330**
Total Production	**420**	**51,545**	

Source: YPAN 2006

According to currently available data from the Ministry of Development, a further eight biodiesel production units are at the initial stages of design and construction: four with a capacity of 5,000 tonnes, two with a capacity of 11,000 tonnes, one with a capacity of 22,000 tonnes and one with a capacity of 100,000 tonnes, with estimated production start dates in the end of 2007.

Automotive biodiesel distributed in Greece has to comply with the specifications of the ELOT EN 14214 standard.

5.5 Poland

According to the Polish law the companies which expressed their interest to produce or store biocomponents must register in the Ministry of Agriculture and Rural Development.

By May 15, 2007, 55 registered undertakings had declared annual ester production capacity totalling 627,000 tonnes per year. The prediction is that in 2008 Poland may produce about 1 million tonnes of fatty acid esters, provided that all currently drawn plans will be finalised.

Key existing and expected actors on the production segment of biodiesel market are:

Trzebinia Refinery – presently main ester producer in Poland. The production capacity is 100,000 tonnes of rapeseed oil methyl esters, and it is planned to be doubled in the nearest future;

Brasco – the company has already chosen the technology for ester production in Polmos Wrocław factory and plans to start production of 150,000 tonnes of ester in mid 2007. The company is also searching for the localisation of the second refinery with the equal production capacity;

Solvent Dwory – has started the production of 36,000 tonnes of esters mid 2006;

Scotan Oleochemia – the company plans to build 2 ester production plants with total production capacity of 250,000 tonnes of esters. One installation will be built on the south of Poland, and one on the North of the country. The production will start in 2007. 50,000 tonnes of esters are planned to be exported. The remaining part will be mixed in 20:80 proportion (20% of biocomponent).

Elstar Oil – the company is building an installation with the production capacity of 50,000 tonnes of esters. Altogether there are plans for three such installations.

J&S Energy – produces biofuels using esters from Trzebinia Refinery. In the second half of 2007, the company is planning to start production of 300,000 tonnes of esters in two factories (near Szczecin and in Brzeg). Production technology is presently being discussed.

Grupa Lotos – announces launching production of 100,000 tonnes of esters in the Czechowice Refinery;

ZPT Olvit – plans to produce 100,000 tonnes of esters;

Polskie Młyny – plans to produce 150,000 tonnes of esters;

Nitric acid production plant in Puławy – intends to produce 100,000 tonnes of esters, however reaching that capacity would have to be spread in time due to present lack of raw material in the factory area.

Apart from big companies' declarations there are also many plans regarding production at the level of several thousands tonnes of esters – partly for own needs and for the purpose of retail sales at fuel stations.

Summarising most reliable announcements and declarations, even 1.2 million tonnes of esters could be expected on the Polish market. That number might be overestimated though.

Some sources predict that the market absorptivity will reach not more than 600,000 tonnes of esters, provided that fuel with 20% ester content will be introduced on the market.

5.6 Romania

The availability of biofuels in Romania is characterised by the incipient market situation.

According to Ministry of Agriculture and Rural Development (Note no. 277339/11.04.2007) in Romania there are twelve private investors fiscal registered for producing and commerce of large quantities of biodiesel, from which the following four are fiscal registered:

1. SC AUTOELITE SRL, Baia Mare, str. Baii, nr.3, jud Maramures;
2. SC BLITZ TRANSPORT SRL, Comarnic, str. Podul-Lung, nr. FN, judetul Prahova;
3. SC ULEROM SA, Vaslui, str. Podul Inalt, nr. 2, judetul Vaslui;
4. SC PRIO BIOCOMBUSTIBIL SRL, str. Dr. Raureanu, nr.1, sector 5, Bucuresti.

The following eight have done the applications for fiscal registration:

1. SC V & G OIL 2002 SRL, Odobesti, Sos. Vrancei, km 6, judetul Vrancea;
2. SC VIROMET SA, Victoria, Aleea Uzinei, nr. 8, judetul Brasov;
3. SC NAZAC TRADE SRL Galati, str. Constructorilor, nr. 8, judetul Galati;
4. SC BIO DIESEL SRL, comuna Murgasi, sat Picaturile, judetul Dolj;
5. SC ANYKPROD SRL, Gradinari, sat Petculesti, nr. 159, judetul Olt;
6. SC LETSOL IMPORT EXPORT SRL, Slatioara, sat Salcia, nr 11, judetul Olt;
7. SC CHIMOFARM SRL, Roman, str. Nordului, nr.3, jud. Neamt;
8. SC PROFILAND SRL, Galati, Sos. Smardan, nr. 1 A, judetul Galati.

According to the Ministry of Economy and Finance [Romania 2007 Report under Directive 2003/30/EC], in Romania the private investors are developing projects to produce large quantities of biodiesel on the basis of the Romanian potential to supply the necessary quantity of raw material of about 500,000 to 550,000 tonnes per year for the production of similar level of biofuel of 500,000 to 550,000 t/yr.

Romania should ensure the introduction on the market for transport purposes of biofuels of 5.75% till 2010 calculated on the basis of energy content of all petrol and diesel used in transport, according to the provision of the Directive 2003/30/EC, that leads to the overall needed quantity of biofuels of about 300,000 t/yr for 2010.

Considering the operative biodiesel capacities in 2007, and the biodiesel producers who put in operation new production capacities and including the interested ones for building new production capacities in the next years, it can be appreciated that Romania could rise capac-

ity production to 400,000 to 500,000 tonnes per year of biodiesel for local market and export on the EU market.

5.6.1 Biodiesel producers

The biodiesel market presents a variety of actors, with both large production units and a number of very small projects.

In 2005, Martifer pioneered in announcing plans to invest in biodiesel production plants and raw materials in Romania, through its division Prio (formerly Biomart). The company announced plans to invest 47 million Euro in building a biodiesel plant at Lehliu Gara, in the Calarasi County. The production should start end 2007 with a 100,000 tonnes/year capacity. An additional 16 million Euro should be invested in a refinery. At a later stage, investments should also be made in crushing capacities.

Prio aims at providing some 30% of the biodiesel demand in Romania. Martifer also announced plans to acquire some 50,000 ha of land from Agromart – a rapeseed and flaxseed supplier – to guarantee biodiesel raw materials supply for this plant.

Since 2007, the Romanian edible oil producer ULEROM (part of the domestic food and agriculture holding company RACOVA) is operating a 60,000 tonnes/year biodiesel production plant, located alongside the company's edible oil plant in Vaslui, northeast Romania. The company is already planning to expand capacity to 120,000 tonnes/year, provided that sufficient demand for biodiesel on the local and international market arises.

Other producing companies include the crushing company Ultex Tandarei (60,000 t/yr capacity), and Autoelite in Baia Mare (20,000 t/yr).

Biodiesel projects that are currently being developed include the Constanta-based Argus company, Expur SA in Slobozia (Ialomita county) with 100,000 t/yr capacity and Procera Biofuels in Fundulea (Calarasi county) with a 35,000 t/y capacity. Spanish investors are said to plan spending some 18 million Euro in the north eastern county of Iasi. The Romanian edible oil producer Prutul intends to invest 25 million Euro over the next three years to modernise production facilities and build a new oil and possibly biodiesel plant.

5.6.2 Oil producers extending production with biodiesel capacities

The crushing company Prutul produced some 25,000 tonnes of edible oil in 2006 and is planning to reach a 12% market share. Other major edible oil producers include Bunge Romania, Argus, Cargill Oils, Ulvex and Ulerom.

Romania holds a very strong position as a producer of edible oils in Europe. With investments estimated at 20 million Euro in 2005, the industry has been evolving rapidly in the past couple of years towards high concentration, given the presence of large players, both domestic and international (Bunge, Cargill, Argus, Agricover, Ardealul currently account for 85% of the oil market). The value of the domestic market is estimated at over 300 million

Euro (which does not include the value of the 20,000 tonnes of oil obtained in rural crushing plants for household self-consumption).

5.6.3 Technology providers

Romania seems to rely mainly on EU technology providers, at least for the most recent biodiesel projects (Desmet Ballestra notably). However, the US-based Greenline Industries supplied in 2007 the equipment for the ULEROM project and seems to be particularly well equipped for the Romanian market since the design allows a rapid deployment of small- to medium-sized plants.

5.6.4 New projects

Starting planning in 2005, Man Ferrostaal company (division of the German truck manufacturer MAN) announced its plans to establish a farm centre and a biodiesel factory at Atel and Loamnes, Sibiu. The Atel project estimates that it would need approximately 120,000 ha of rapeseed per year and it was firstly planed to start building of the biodiesel production capacity by the end of 2007. Presently the construction is delayed based on extended negociations of the biodiesel refinery project.

6 End users

6.1 Belgium

Biodiesel in Belgium will be used exclusively in the transport sector. Light fuel oil for heating has one of the lowest tax rates in Belgium compared to other European countries. Biodiesel is therefore not competitive at the current oil price.

Objective

The objectives for Belgium are outlined in the table below. If we estimate the consumption of gasoline and diesel for the year 2010 (evolution of - 4,4%/yr for gasoline and + 4,7%/yr for diesel between 1995 to 2005, convert this consumption into toe and multiply by the objective for Belgium, we can estimate that about 542,000 toe biofuels are necessary to meet the objective.

Table 6-1 Evolution of diesel and gasoline consumption and calculated target for Belgium

Year	Gasoline (t)	Diesel fuel (t)	Total (toe)	Objective (%)	Objective (toe)
1994	**2,814**	**3,908**	**6,816,592**		
1995	**5,082**	**3,930**	**6,829,565**		
1996	**4,908**	**4,144**	**6,950,974**		
1997	**4,538**	**4,415**	**7,019,707**		
1998	**4,494**	**4,629**	**7,213,160**		
1999	**4,279**	**4,838**	**7,305,362**		
2000	**4,008**	**5,100**	**7,421,137**		
2001	**3,900**	**5,331**	**7,595,451**		
2002	**3,898**	**5,761**	**8,031,732**		
2003	**3,861**	**6,182**	**8,439,662**		
2004	**3,611**	**6,303**	**8,422,148**		
2005	**3,238**	**6,236**	**8,146,219**	**2.00**	**162,924**
projection 2006	**3,096**	**6,531**	**8,366,294**	**2.75**	**230,073**
projection 2007	**2,958**	**6,839**	**8,604,037**	**3.50**	**301,141**
projection 2008	**2,828**	**7,162**	**8,859,965**	**4.25**	**376,549**
projection 2009	**2,704**	**7,501**	**9,134,629**	**5.00**	**456,731**
projection 2010	**2,584**	**7,855**	**9,428,623**	**5.75**	**542,146**

Source: Jossart 2006b

This projection of fuels consumption shows that the biodiesel volume of the call for tenders (334,400 t/yr) is equivalent to 4% of the market in 2010. Together with the ethanol volume (198,500 t/yr) the call for tenders reaches 4.4% (energy) of the fuel market. It means that this is not sufficient to reach the 5.75% target for Belgium.

Other issues

In addition it is important to note that the Belgian system does not foresee any obligation. Biodiesel producers have to market their production without any obligation on the side of the oil companies. For biodiesel however the problem is less crucial than for ethanol for which the volume represents 12% of the 2010 market, almost impossible to reach.

The communication around biodiesel development is another key aspect to look at. In a first experience a B3 blend was distributed in a public pump and announced as biodiesel for the consumers. After a few days the oil company noticed that fewer clients were visiting this pump because they were afraid of this new kind of fuel. It is likely that the communication strategy of fuel distributors will be adapted in the future or that the biodiesel blends will be completely anonymous.

Fig. 6-1 First biodiesel pump in Belgium in December 2006 (in reality a B3 blend)

As mentioned before, the tax exemption for high blends is valid only for public transportation companies. In Belgium three companies are focused: TEC, De Lijn, STIB. It is not known yet if they will step in and use biodiesel but it would be extremely welcome for the biodiesel sector as the communication around these experiences would certainly be valuable.

Finally Belgium would have to evaluate already the strategy beyond 2010. An objective of 10% by 2020 might be feasible, at least regarding the installed capacity.

6.2 Bulgaria

End users of biodiesel in Bulgaria are transport companies, private cars and some heating systems. As mentioned, official statistics about biodiesel production and consumption don't exist yet, therefore, just some examples of various types of end users will be provided here.

For example, one of the clients of the first biodiesel producer in Bulgaria, Sampo AD, is the transport company Trayana Trans, which uses biodiesel as a fuel for its fleet of trucks.

Another example is the Trade Storehouse in Gabrovo, which has its own biodiesel installation and the produced fuel is used both for transport and for heating purposes.

Several filling stations in Bulgaria provide biodiesel, e.g. the 8 filling stations of the company Tempo Petrol EOOD.

6.3 Cyprus

The energy system of Cyprus is an isolated energy system without indigenous sources of energy apart from renewable potential and is therefore almost entirely dependent on imported fuels. Imported crude oil and final oil products cover more than 97% of the country's primary energy supply needs. Imported coal which is used in the cement industry accounts for another 1%. Energy consumption has increased by 7% per year in recent years.

Total primary energy consumption

The Cyprus energy sector is heavily dependent on conventional fuels, and in particular oil. Almost 90% of the energy production is fossil fuel dependent, a phenomenon that during the last years had a number of negative implications on the local social and economic environment. In this sense, the promotion and adoption of new technologies which substitute and reduce the oil dependency will be widely welcome by both public and private sector. The energy supply is completed by a small contribution of RES (4% – mainly from solar energy used for water heating and biomass used for domestic heating in individual woodstoves) and solids (2%) for industrial applications. In Cyprus, renewable energy sources constitute the only indigenous source of energy and may contribute significantly to the energy autonomy of the island.

Present status and prospects of the transport sector

In the following figure the net domestic consumption per sector is presented. The largest consumer is the transport sector (52%, thus higher than the EU average which is 32%), while 27% of the energy is consumed in industry, 13% in the residential sector and the rest 8% in the tertiary sector. Road transport is the biggest and fastest growing energy consumer, corresponding to about 67% of the total transport energy consumption. The use of diesel (42%) dominates over kerosene (33%) and gasoline (25%).

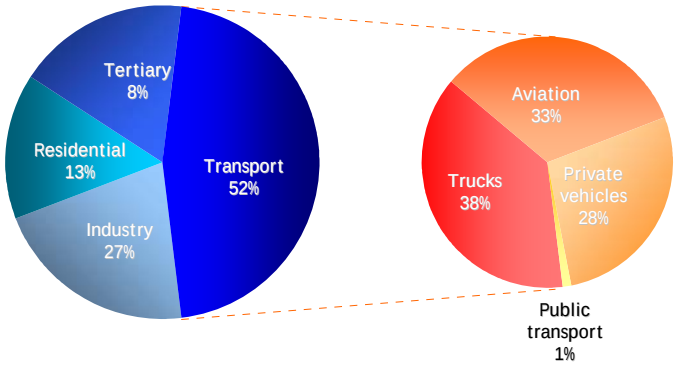

Fig. 6-2 Domestic primary energy consumption per sector (Source: SSRC 2003)

Taking into account the overall European Union trends of the total primary energy supply and final energy demand by sector (presented in the following diagrams) it is assumed that the oil demand and the respective proportion of RES in Cyprus will be increased in the following years. Additionally, the energy demand for the transportation sector will also be increased. This trend is also confirmed via specific projections on the Cyprus future fuel demands. The past and the future oil product demands for the transportation sector are presented in the following chart.

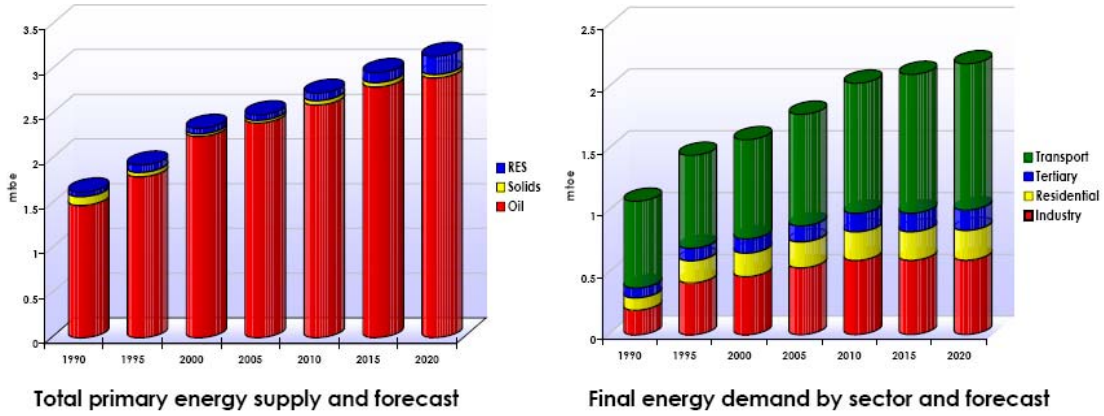

Fig. 6-3 Total primary energy supply and final energy demand by sector from 1990 to 2020 (Source: EC 2003)

An interesting phenomenon is taking contemporarily place in Cyprus energy sector which can be mentioned in the following figure (common annual consumption diesel-gasoline diagram). The percentage of diesel in the transportation fuel market was during past years bigger than that of gasoline but nowadays the trend is totally reversed. The provisions show that the total fuel consumption will be increased and the market shares of the two major fuels will be nearly equal. This trend obviously reduces respectively the potential market share of biodiesel.

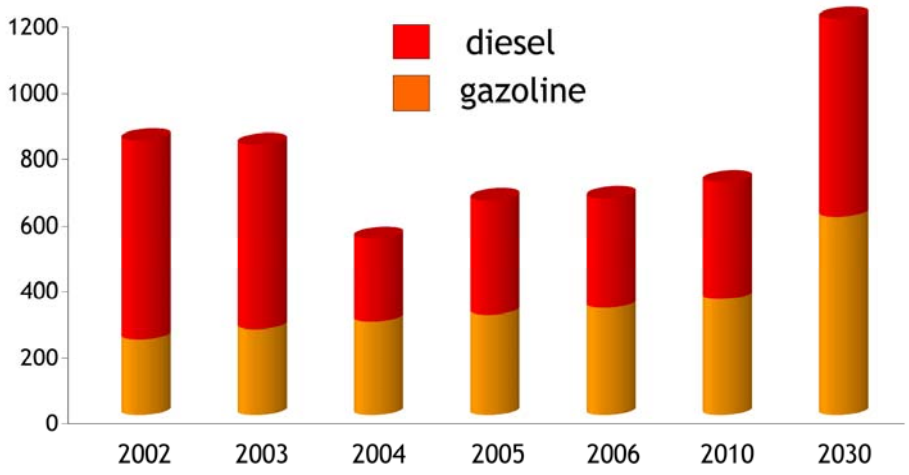

Fig. 6-4 Liquid fuels distribution and relative provisions (Source: EC 2003), revised using data from Statistical Service of the Republic of Cyprus

After the dissemination of information concerning the biodiesel market properties that took place during the Biodiesel Chains Cyprus National Event (18, January 2006) two of the most significant private public transportation companies (Travel Express Ltd. & Nicosia Buses Ltd.) showed great interest.

Heat sector

According to the official statistical data in Cyprus, the heating technologies used in the residential sector are presented in Table 6-2.

Table 6-2 Heating technologies used in the residential sector in tonnes / year

	1992	2001	
Central heating (kerosene)	**22,163**	**60,453**	**27%**
Storage heaters (E.A.C.*)	**4,002**	**12,133**	**5%**
Fixed room units (hot air)	**3,564**	**20,981**	**9%**
Fireplace	**16,158**	**10,700**	**5%**
Electric stoves	**8,807**	**18,779**	**8%**
Gas/diesel stoves	**124,545**	**92,861**	**42%**
No heating	**3,927**	**4,084**	**2%**
Other type/not stated	**577**	**2,402**	**1%**
Heating (tonnes per year)	**183,743**	**222,393**	**100%**
*** Electricity Authority of Cyprus**			**Source: EC 2004**

As it can be seen by the above table about 60% of the space heating needs are covered by diesel. Electricity (22%), liquefied petroleum gas (LPG) (9%) and biomass (5%) also contribute to space heating. Most of the households are equipped with central hot water systems (diesel boilers). Split type air-conditioning units operating in heating mode are also used as heater in wintertime. LPG heaters are used for heating in many households especially in rural areas. Finally only few households still utilise kerosene.

6.4 Greece

Biodiesel is used only in the transport sector. Initially, biodiesel is intended only for blending with automotive diesel in a proportion not exceeding 5% by volume. Distribution of pure biodiesel on the retail market will follow, as will the blending of a higher proportion of biodiesel in automotive diesel intended for vehicle fleets (e.g. public transport vehicles).

The distribution of biodiesel in Greece started in December 2005 when the first batches were distributed to refineries by Hellenic Biopetroleum S.A. The blend of 2% biodiesel by volume in automotive diesel has been distributed to all final consumers since February 2006 and continues to be distributed smoothly. This percentage was raised to 3.5% by volume by about the end of 2006, and is expected to reach 5% by the end of 2007.

6.5 Poland

Biodiesel is still not commonly used in Poland. It is mainly used by transport sector. The main organisations which represent end users are presented in the following.

Chamber of Urban Transport (IGKM)

Chamber of Urban Transport was founded in March 1991 and continues the tradition of co-operation between urban transport companies, which primarily was realised by the other organisations.

The Chamber's members are mainly operators and organisers of passenger transport in cities, irrespective of their organisational forms (budgetary units, limited liability companies and joint stock companies). The membership is also open to fleet manufacturers, repair-works and research institutes as well as to other suppliers to urban transport.

The Chamber includes in general about 220 members. IGKM is a voluntary organisation carrying its activity on the basis of the Act of 30/05/1989 on commercial chambers. It is financed from membership fees as well as from its own economic activity.

The main objectives of IGKM's activities are the following:

initiating projects of legal regulation in the domain of urban transport and expressing opinions on them;

spreading the latest achievements in the domain of urban transport with regard to organisational, economic and technological problems;

organising co-operation between IGKM's members and exchange of opinions in all the domains being of interest to the members;

creating conditions for equal rights competition between municipality, private and State operators;

creating conditions for free but honest competition between fleet manufacturers and for other suppliers of services to urban transport;

maintaining a database of urban transport in Poland and

international co-operation.

The Chamber is a member of International Union (Association) of urban and regional Public Transport (UITP) based in Brussels and co-operates with similar IGKM domestic organisations in France, Germany, Belgium, Switzerland, etc.

Polish Automotive Industry Association (PZPM)

Polish Automotive Industry Association is the biggest Polish organisation of automotive industry employers. PZPM associates 31 companies: car and motorcycle producers and their representatives in Poland. It represents interests of associated companies vis-à-vis public authorities, regulatory bodies and other non-governmental organisations. Subscribing to

common opinion that the automotive industry is “the engine of national economy”, PZPM initiates legislative procedures and gives its opinion on legal acts and regulations due to develop, improve and promote national automotive sector. As a member of ACEA (the European Automobile Manufacturers Association), PZPM is represented to the EU Institutions in Brussels and Strasbourg.

In the Polish Automotive Industry Association, a major role is played by the Management Board which is directly creating organisation policy and undertaking strategic decisions on key issues. The Board is comprised only of representatives in the rank of president or director general of member companies.

In order to provide for the best representation of different group interests of member companies, 4 sections were established by PZPM. Those sections are:

passenger vehicles section,

trucks and busses section,

manufacturers section and

motorcycle section.

At present, apart from the sections, a number of workgroups are operating. The major ones are:

Tax issues workgroup,

CEPiK workgroup,

Digital Tachographs workgroup,

Insurance workgroup,

Homologation workgroup,

PR workgroup,

Motorcycle Sales Statistics workgroup.

Therefore, representatives of member companies have direct influence on the decision-making process, whilst maintaining the imperative value of democracy and equality of all companies in PZPM.

Direct involvement of associated members in the activities of particular work groups and sections has been advantageous, as more company heads became involved in the conceptual work, thus working out common, unanimous positions on such key issues as the ecological tax, value-added tax (VAT) or the common PR campaign.

The Polish Chamber of Automotive Industry (PIM)

The Polish Chamber of Automotive Industry is a nationwide business sector self-government institution with members from all entities involved in the Polish automotive industry. The chamber was founded in April 1994 and operates on the basis of its charter and the Act on

Chambers of Commerce of 1989. Since 1996 the chamber is a member of the Polish Chamber of Commerce and since 2002 is also a CECRA member.

The members of PIM are:

parts and components producers,

workshop equipment and tool producers and distributors,

car dealers,

authorised service stations,

unauthorised repair shops,

unions and associations and

publishers.

The main goals and assignments of the Polish Chamber of Automotive Industry are:

1. Representing and supporting the interests of automotive industry entities associated with the chamber;
2. Inspiring the creation of legal acts associated with entrepreneurship, motorisation;
3. Improvement of traffic conditions and automotive infrastructure as well as presenting opinions on these acts;
4. Co-operation with local and central government entities as well as business and community organisations in creating better conditions for the development of entities functioning in the automotive sector;
5. Collecting, providing and publishing information associated with co-operation, organisational structures and financing;
6. Promoting companies associated with the chamber as well as their goods and services;
7. Organising business co-operation with domestic and foreign partners;
8. Co-operation with chambers of commerce in other countries as well as international organisations operating in the automotive sector;
9. Promotion of modern management methods and use of the most modern equipment;
10. Organising conferences, symposiums, training seminars and executing publishing activities;
11. Co-operation in preparing trade fairs, equipment presentations and economic missions;
12. Organising vocational training courses in the automotive sector.

6.6 Romania

Transport Sector

The transport sector in Romania is a significant consumer of final energy. The yearly total consumption of fuel in 2005 was of 4.173 million tonnes from which 2.72 million t diesel and 1.45 million t gasoline, according to the Ministry of Economy and Finance (Romania 2006 Report on quality of marketed fuels for transportation under Directive 2003/17/EC).

The numbers of motor vehicles registered at end 2006 are given in Table 6-3.

Table 6-3 Number of registered motor vehicles at end 2006

Buses (91% diesel powered)	**22,663**
Microbuses (84% diesel powered)	**17,755**
Cars (33,4% diesel cars)	**3,603,437**
Merchandise vehicles (87,7% diesel)	**545,300**
Total (without motorcycles)	**4,189,155**

Source: Romanian Ministry of Transport

The yearly total consumption of fuel in 2006 was 4.557 million tonnes, from which 3.1 million t diesel and 1.45 million t gasoline, according to the Ministry of Economy and Finance (Romania 2007 Report under Directive 2003/30/EC).

Presently, the cost of fuel, at the fuel station pump, is:

- about 1.06 Euro per litre of gasoline
- about 0.97 Euro per litre of diesel fuel

The diesel market is expected to increase sharply by 2020, and the number of diesel cars to be 3 times more than in 2005.

End users

Since the announcement of the biofuels mandate, major domestic fuel suppliers such as Rompetrol and Lukoil signalled their willingness to invest in captive biofuel facilities

The oil company Rompetrol is building a 60,000 tonnes per year biodiesel unit in Navodari, with an expected start in 2008. Rompetrol Downstream has already introduced in its stations and warehouses network a B2 blend branded ‘Efix Diesel’, which will be distributed in more than 350 petrol stations. The firm has signed a 20,000 tonnes contract for biodiesel supply with the Portuguese group Prio/Biomart, part of Martifer.

The local branch of the Russian oil company Lukoil will invest 15 million dollars in a biodiesel production line at its Petrotel refinery and should start biodiesel production in the first half of 2008.

Ulerom has negotiated distribution contracts with local oil companies Petrom and Rompetrol.

Deliverable 16
Analysis of international trade issues

7 International trade

7.1 Belgium

Import of raw material

The comparison with the internal supply of rapeseed and the biodiesel industry demand for vegetable oil is extremely clear. As mentioned above 10,000 hectares of rapeseed are cultivated in Belgium. This corresponds to roughly 35,000 tonnes of rapeseed and 14,000 tonnes of rapeseed oil.

To reach the quantity of the call for biodiesel, roughly 380,000 tonnes of oil are needed, meaning that Belgium will be able to provide less than 5% of the demand. It is foreseen that large quantities of rapeseed, rapeseed oil, soybean oil and to a certain extent palm oil will be imported in Belgium. Certification of these imports will certainly be an issue on the coming years.

Export of biodiesel

The capacity of the biodiesel industries in Belgium will exceed the need for the Belgian market. It is estimated that a capacity exceeding 500,000 tonnes of biodiesel will be operational by the beginning of 2008. Therefore there is a clear potential for exporting biodiesel abroad.

7.2 Bulgaria

Some international trade activities related to biodiesel are as follows:

Bulgaria exports sunflower seeds and (in some years) even rapeseed harvest;

Bulgaria imports from Romania methanol, used for biodiesel production.

According to statistical information, published on the web site of the Bulgarian Ministry of Agriculture and Forestry [BMAF 2007b], the export of sunflower seeds during the last 3 years was as follows:

2004: 252 759 t/yr

2005: 489 350 t/yr

2006: 488 875 t/yr

As far as we know, there aren't yet any cases of export or import of biodiesel or of any type of oil, intended for biodiesel production. But some initial studies were made for possible import of palm oil from Malaysia.

7.3 Cyprus

Until now there is no import to or export from Cyprus of raw material or end products. The quantities of unprocessed oils that are imported by the major vegetable processing company are not imported exclusively for biodiesel production and thus they cannot be considered as imported raw material for biodiesel production.

The issue of importing pure biodiesel or diesel-biodiesel blend is under discussion by the petrochemical oil distribution companies but there is no specific data or future projections since the commercial framework is under development and the representatives of the companies are unable to discuss these issues publicly.

7.4 Greece

Biodiesel is quite new to the Greek fuel market and there are no official records for traded quantities of oil or biodiesel at the moment. There are however biodiesel importing companies that got quota for biodiesel imports in 2007.

7.5 Poland

In 2005, approximately 17,100 tonnes of biodiesel were placed on the fuel market. Diesel consumption decreased by nearly 770,000 tonnes compared with the previous year. The amounts of biofuels used in fuels between 2000 and 2005 and the preliminary data for 2006 are shown in Table 7-1.

Table 7-1 Amounts of biofuel used in fuels between 2000 and 2005 and preliminary data for 2006

Year	Gasoline **(thousands of tonnes)**	Diesel fuel **(thousands of tonnes)**	Bioethanol **(thousands of tonnes)**	Esters **(thousands of tonnes)**	Share based on energy content
2000	**4,841**	**2,343**	**40.6**	**0**	**0.35%**
2001	**4,484**	**2,562**	**52.4**	**0**	**0.46%**
2002	**4,109**	**2,940**	**65.3**	**0**	**0.57%**
2003	**3,941**	**3,606**	**60.1**	**0**	**0.49%**
2004	**4,011**	**4,303**	**38.3**	**0**	**0.29%**
2005	**3,915**	**5,075**	**42.8**	**17.1**	**0.47%**
2006*	**4,048**	**6,042**	**84.3**	**44.9**	**0.92%**

*** estimated values** **Source: PME 2007a**

Around 76% of the national production was exported. Germany is the main direction of export of the esters used for biodiesel production.

The level of production and export in the first and second quarter of the year 2007 is presented in Table 7-2.

Table 7-2 Level of ester production and export in the first and second quarter 2007

	1st quarter 2007	2nd quarter 2007
Production of pure oil and esters	**45,194 t**	**43,047 t**
Sale of pure oil and esters	**35,442 t**	**41,257 t**
- export	**33,301 t**	**38,659 t**
- internal market	**2,141 t**	**2,598 t**

Source: ERO 2007

7.6 Romania

In Romania there is no international trade of biodiesel at present while the production capacities are at the primary stage of development being estimated that first industrial capacities to start production of biodiesel by the end of 2007.

The agriculture for rapeseed production participates actively over the last years at the international trade at European scale, of raw material for biodiesel production. Hence, the large majority (90%) of rapeseed production is exported, while the remaining rapeseed and rapeseed oil production is used in Romania for other purposes than biofuel (textiles and chemistry). USDA FAS informs that Romania exported 85,000 tonnes of rapeseed to other EU countries (Germany, Denmark and Sweden) in 2001/2002 to be processed for biodiesel production. The rapeseed cultivated area and production have a continuous increasing trend. Currently, we may consider that over 100,000 tonnes of rapeseed production are exported for biodiesel production.

The Romanian producers of biodiesel, following the start of production from the end of 2007 foreseen for exporting in Europe an important share of the biodiesel production, but the main part of production to be distributed on local market.

The further accession of Romania on the European biodiesel market will support to boost interest for alternative motor fuels and will increase the „acceptability" of biodiesel as a common trading commodity, a most important step for strengthening the biodiesel supply chain and market structures for biodiesel products and technologies in Europe as a whole.

Considering Romania's important potential for biodiesel production, it is important to avoid that overproduction situation arise in the medium term. It is therefore essential to ensure a genuine market for Romanian biodiesel both internally as well as in the EU. With regard to market opportunities in Romania, it seems essential to devise a wide-ranging information campaign targeting the public on the main advantages of biodiesel. Another option would be the promotion of high blends towards public transportation companies and captive-fleets managers. On the export side, Romania could already secure market opportunities with EU countries lacking biodiesel (e.g. Slovenia, Malta, Cyprus).

Considering the potential of operative biodiesel capacities in 2008, and the biodiesel producers who put in operation new production capacities and including the interested ones for building new production capacities in the next years, it can be appreciated that Romania could rise capacity production to 400,000 to 500,000 tonnes per year of biodiesel for using on local market of around 300,000 tonnes per year and export the rest on the EU market.

Marketing of glycerine

With regard to glycerine, Romania should probably ensure additional outlets for biodiesel glycerine by investing in pharmaceutical grade refining capacities, which is still missing so far.

Marketing of by-products

As an EU Member State benefiting from the advantages of the internal market, Romania would certainly benefit from exporting the meals resulting from biodiesel production to cover EU deficit in vegetable proteins.

8 Summary and conclusions

In order to reach the goal of determining “how to create country-specific favourable conditions to increase penetration of biodiesel in the participating countries”, the current situation and trends in each of the countries under investigation were evaluated with focus on the following aspects: (1) policies and regulations, (2) raw material supply, (3) biodiesel producers, (4) biodiesel end users and (5) international trade.

As shown by the results of this work package, the regarded countries (Belgium, Bulgaria, Cyprus, Greece, Poland and Romania) are currently at very different stages of biodiesel use and it can be said that they represent individual cases, with especially the driving forces for biofuel production and consumption differing from case to case. In Cyprus, for example, the producers and consumers are eager to adopt biodiesel, while very few domestic raw materials are available there and it has yet to be seen from where the necessary materials or also finished biodiesel may be imported in the future. Furthermore, the legal framework regarding biofuels lacks precise definitions of obligations, advantages and limits; with this, it rather inhibits any production and consumption of biodiesel in Cyprus. In other cases, for example in Poland, large amounts of oil seeds are produced and the greatest share of these is exported in order to serve the biodiesel markets in other countries, while the remaining fraction is used as non-energy biomaterials in the producing country.

All of these differences and the specific challenges resulting from them can be traced back to several parameters. Biogeographic conditions are directly determining, but society and economic structures which have evolved over time, such as organised cooperatives and unions of agricultural or processing businesses, also play a role. The interweavement with the international market for biodiesel raw materials, biodiesel itself and energy carriers in general varies greatly for each country-setting. From this, it logically follows that the current biofuel policies of the regarded countries differ in many points and that their future development will also have to be designed along individual lines.

Due to these country-specific conditions, a strategy for the promotion of biodiesel use according the EU aims (see WP5) can only be developed specifically for one precise region or a situation defined by a certain set of framework conditions. In this context, however, the experiences gained in other countries (see also WP3) could provide exceedingly valuable clues to how successful certain (promotion) measures might really be.

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10 Annex

10.1 Currency exchange rates

Country	National currency	Exchange rate: (national curr. : Euro)	Date of calculation	Source (e.g. URL)
BG	**Lev (BGN)**	**1 BGN : 0.51129 Euro**	**Fixed rate, 01.01.2007**	**In respect of Art.29, Law of Bulgarian National Bank**
CYP	**CYP**	**1 CYP : 1.71 Euro**	**January 1st, 2008 (date of acces-sion to EU)**	**http://www.euro.cy**
PL	**Polish zloty (PLN)**	**1 PLN : 0,2654 Euro**	**October 1st, 2007**	**National Bank of Poland, http://www.nbp.pl**
RO	**Leu (RON)**	**1 ROL : 0,298 Euro**	**October 9th, 2007**	**National Bank of Romania, http://www.bnr.ro**

10.2 Alphabetical list of abbreviations

AD - Public Limited Company (Bulgaria)

BGSG - The Bulgarian State Gazette

BMAF - Bulgarian Ministry of Agriculture and Forestry

CEN - European Centre of Normalisation

CRES - Center for Renewable Energy Sources

EEA - Energy Efficiency Agency

EC - European Commission

EN - European Norm

EU - European Union

ETBE - Ethyl tertiary butyl ether

GMO - Genetically modified organism

HG - Romanian Government Decision

IFEU - Institut für Energie- und Umweltforschung Heidelberg GmbH (Institute for Energy and Environmental Research Heidelberg, Germany)

JICA - Japan International Cooperation Agency

KAPE - The Polish National Energy Conservation Agency

KDP - Ministerial Order (Cyprus)

KZPR - Polish Federation of Crops Producers

MB - Moniteur Belge

OOD - Limited Company (Bulgaria)

OJ L - Official Journal of the European Union

PLG - The Polish Law Gazette

PMOE - The Polish Ministry of Economy

PPO - Pure plant oil

toe - Tonnes of oil equivalent

RES - Renewable energy sources

SME - Small and medium enterprises

USDA FAS - United States Department of Agriculture – Foreign Agricultural Service

VAT - Value-added tax