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Biofuels Progress Report

**Report on the progress made in the use of biofuels and other renewable fuels in the
Member States of the European Union**

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1. INTRODUCTION – THE POTENTIAL BENEFITS OF BIOFUELS

Biofuels are transport fuels made from organic material. The most common biofuels today are biodiesel (made from vegetable oils) and bioethanol (made from sugar and starch crops). Research is under way to commercialise “second-generation” production techniques that can make biofuels from woody material, grasses and some additional types of waste.

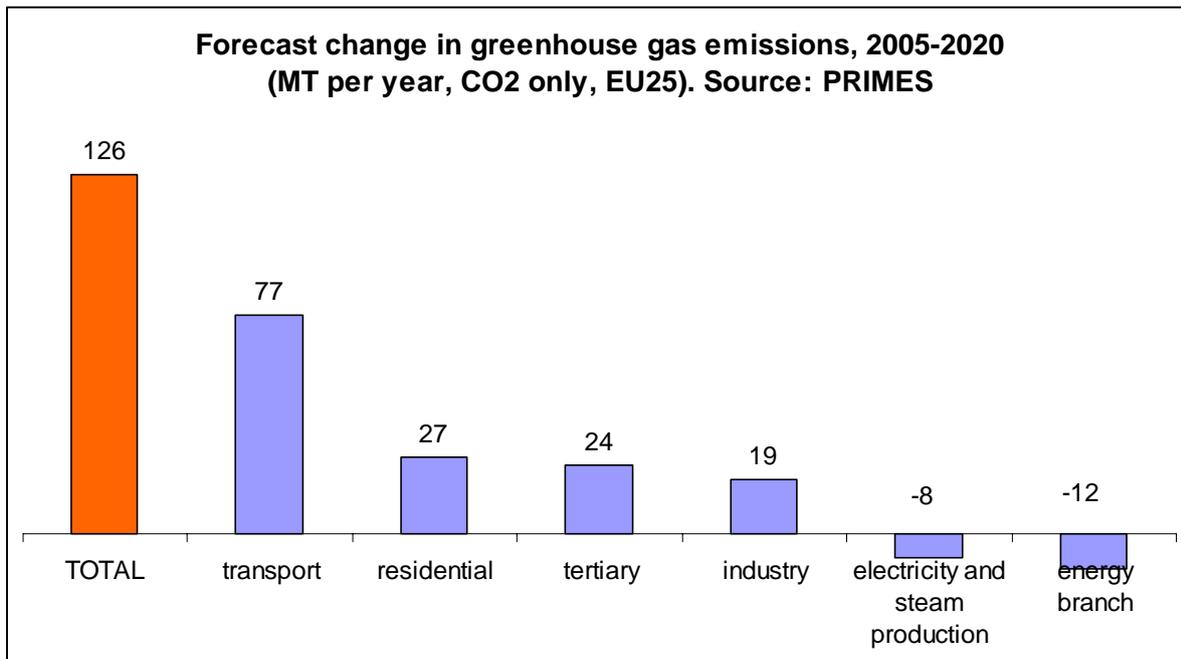
Biofuels have a unique role to play in European energy policy. They are today the only direct substitute for oil in transport that is available on a significant scale. Other technologies, such as hydrogen, have enormous potential. However, they are far away from large-scale viability and will require major changes to vehicle fleets and the fuel distribution system. Biofuels can be used today, in ordinary vehicle engines (unmodified for low blends, or with cheap modifications to accept high blends).

Changing the fuel mix in transport is important because the European Union's transport system is almost entirely dependent on oil. Most of this oil is imported, much of it from politically unstable parts of the world¹. Oil is the energy source that represents the most severe security of supply challenge for Europe.

Biofuels have a second great advantage: the fact that their production and use leads to greenhouse gas savings. They are not the cheapest way to get greenhouse gas savings. But they are one of the few measures – alongside improvements in vehicle efficiency – offering the practical prospect of large-scale savings in the transport sector in the medium term. As the chart shows, there is a particular need for greenhouse gas savings in transport because its annual emissions are expected to grow by 77 million tonnes between 2005 and 2020 – three times as much as any other sector.

Thus, biofuel promotion offers benefits both for security of supply and for climate change policy. However, it is important to note that it is possible to produce biofuels in ways that do not deliver greenhouse gas savings or that cause significant environmental damage – for example, through the use of land converted from high-diversity natural environments. To be effective, biofuel policy needs to ensure that this is avoided.

¹ In 2000, Europe's oil imports stood at 9 million barrels per day (mbpd): 2 from Africa, 3 from the Middle East and 4 from Russia and the CIS. By 2030, imports are expected to grow to 14 mbpd – with the Middle East accounting for 80% of the increase, and Russia/CIS for the other 20%. (International Energy Agency (2004): World Energy Outlook, 2004.) Data relate to OECD Europe.



2. DEVELOPMENT OF EU BIOFUEL POLICY; THE REQUIREMENTS OF THE BIOFUELS DIRECTIVE

Biofuels have been around for a long time. In fact, the model T Ford was originally designed to run on bioethanol. But oil-based fuels established a dominant position in road transport by the 1930s. This remained the case across the world until, with an active policy of government support, bioethanol took off in Brazil in the 1970s. There it has now reached 11% of the road transport fuel market².

In Europe, a few countries began to take an interest in biofuels during the 1990s. The EU began to pay serious attention to the subject in 2001, when the Commission brought forward the legislative proposals that were adopted in 2003 in the form of the biofuels directive³ and Article 16 of the energy taxation directive⁴.

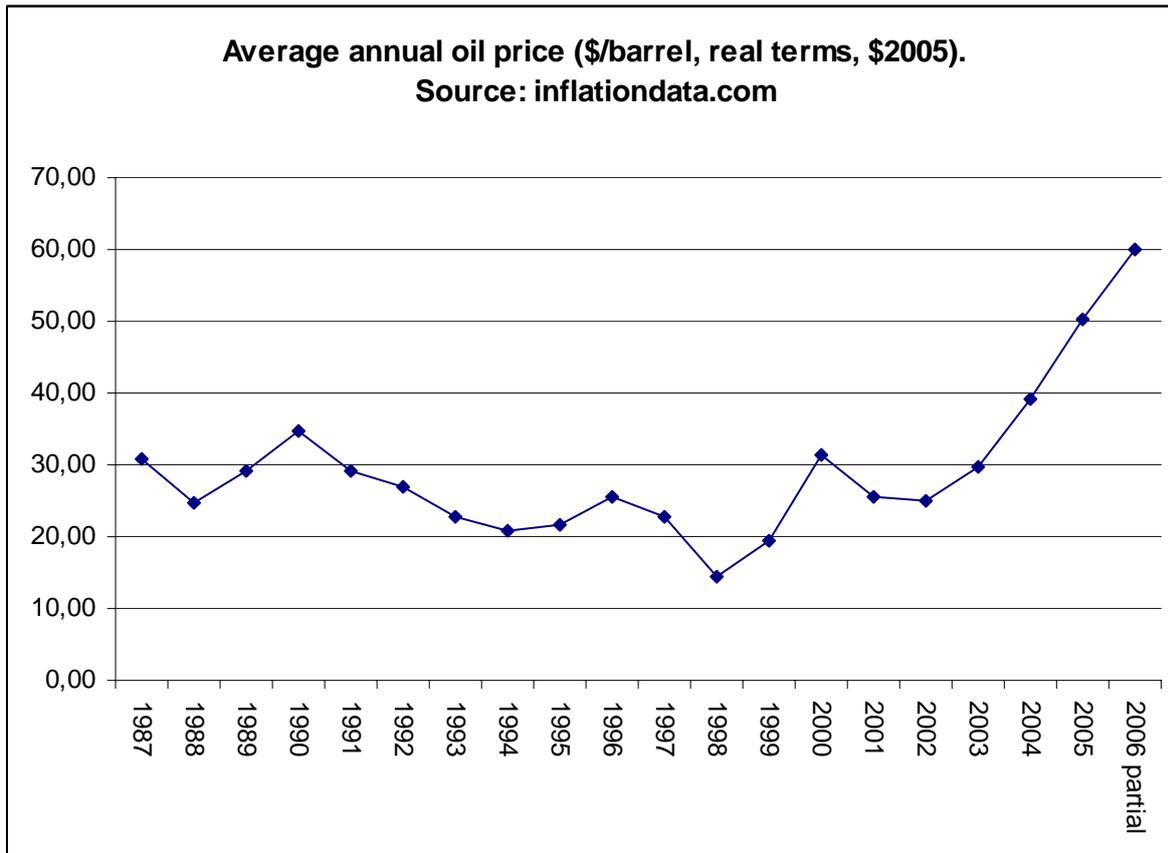
The debate on these proposals took place under conditions that were rather different from today's.

At that time biofuels were a marginal fuel. Their EU market share in 2001 was only 0.3%. Only 5 of the then Member States had significant direct experience with the use of biofuels: for most of the rest they were an unknown quantity. Meanwhile, as the chart shows, real oil prices had fluctuated around the \$20-\$30/barrel band for more than 15 years.

² 2005, by energy content.

³ Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport (OJ L 123, 17.5.2003, p. 42).

⁴ Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity (OJ L 283, 31.10.2003, p. 51).



In the light of this, it is perhaps not surprising that the Union decided to proceed in a cautious manner, step by step. The biofuels directive expressed the clear intention of “*promoting the use of biofuels... in each Member State, with a view to contributing to objectives such as meeting climate change commitments, environmentally friendly security of supply and promoting renewable energy sources*”⁵. However, while the Union’s other renewable energy targets (for renewable energy’s overall share and for electricity generation) are for 2010 alone, the biofuels directive includes not only a target for 2010 (5.75% share of the market for petrol and diesel in transport) but also an interim target for 2005 (2%). Member States were required to set indicative targets for 2005, taking this reference value into account.

These national indicative targets, once adopted, are not mandatory. While they constitute a moral commitment on behalf of Member States, there is no legal obligation for them to achieve the levels of biofuel use they have chosen to target. The step by step approach to European biofuel policy is reflected in the fact that, unlike the directive on renewable energy in electricity⁶, the biofuels directive did not at this initial stage contain any requirement for Member States to “take appropriate steps” to achieve their 2005 targets.

⁵ As well as biofuels, the directive applies to "other renewable fuels". At present, national targets for the use of renewable energy in land transport are addressed entirely through the use of biofuels. It is assumed that this will remain the case in future. For simplicity, the terms "biofuel" and "biofuels directive" are used in this report; they should be understood as referring to other renewable fuels where appropriate.

⁶ Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market (OJ L 283, 27.10.2001, p. 33).

Instead, and crucially, the directive contains a “review clause” (Article 4.2). By the end of 2006, the Commission is required to report on progress in the use of biofuels. “*On the basis of this report*”, the directive continues, “*the Commission shall submit, where appropriate, proposals to the European Parliament and to the Council on the adaptation of the system of targets... If this report concludes that the indicative targets are not likely to be achieved for reasons that are unjustified and/or do not relate to new scientific evidence, these proposals shall address national targets, including possible mandatory targets, in the appropriate form*”.

Thus, when adopting the directive, the EU recognised that a strong system of targets, perhaps even mandatory ones, might be necessary to ensure that the 2010 objective is attained. But it preferred to defer a decision on whether such a strong system is needed until the EU institutions could consider a report - this report – on whether, without such a system, the interim 2% objective had nevertheless been achieved.

Because the function of this report is to report on progress up to 2006, it does not cover the states that acceded to the Union in 2007 (Romania and Bulgaria). These states are due to make their first national reports under the biofuels directive by 1 July 2007. They have good potential to produce bioenergy⁷; their accession will facilitate the development and implementation of Community biofuel policy.

While the report focusses on progress towards the objectives in the biofuels directive, it is important to note that these objectives are supported by measures under the Common Agricultural Policy, especially following its reform in 2003. By breaking the link between payments made to farmers and the particular crops they produce, the reform allowed them to take advantage of new market opportunities such as those offered by biofuels. In addition, while farmers cannot cultivate food crops on set-aside land, they can use this land for non-food crops including biofuels; an energy crop credit is available for biofuels, and will be extended to all Member States in 2007; the forest action plan⁸ sets out measures in favour of wood energy; and the new rural development policy includes measures to support renewable energies. Finally, the "cross-compliance" system makes payments to farmers conditional on respect for Community environmental legislation and on keeping agricultural land in good environmental condition. It ensures that crops used for biofuels as well as for food meet standards of environmental sustainability.

3. ASSESSMENT OF PROGRESS

Since 2003, the price of oil has doubled. The EU has had several reminders of the disruptible nature of its energy supplies – for example, the effects of Hurricane Katrina on oil supplies in August/September 2005 and the temporary shortfall in gas supply via Ukraine in January 2006. Meanwhile, biofuels have proved themselves a credible alternative to oil. In most Member States, the diesel that motorists buy already includes biodiesel in low blends; major oil companies have announced biofuel investment programmes worth hundreds of millions of euros; and vehicle manufacturers have begun marketing cars capable of running on high bioethanol blends.

⁷ For example, they each have 0.7 hectares of agricultural land per capita, compared to 0.4 in the EU-25.

⁸ COM(2006) 302 on an EU forest action plan

As the table in Annex 1 shows, by 2005 biofuels were in use in all but 4 of the 21 Member States for which data are available. Their market share reached an estimated 1%⁹. This figure represents a good rate of progress – a doubling in two years. Nevertheless, it is less than the 2% reference value, and less than the 1.4% share that would have been achieved if all Member States had met their targets. Moreover, progress was very uneven. Only Germany (3.8%) and Sweden (2.2%) reached the reference value. While biodiesel achieved a share of about 1.6% of the diesel market, ethanol achieved a share of only 0.4% of the petrol market.

Between Member States, this unevenness is diminishing. Since the beginning of 2005, 13 Member States¹⁰ have received state aid approval for new biofuel tax exemptions. At least 8 Member States have brought biofuel obligations into force or announced plans to do so.

As Annex 2 shows, 19 Member States have already set targets for 2010. If they all achieve the shares they have targeted, biofuels' share in these Member States will reach 5.45% - a shortfall of 0.3% compared to the objective. The experience of 2005 suggests that in practice the shortfall will be rather greater. In 2005, among 21 Member States for which data are available, only two achieved the targets they had set. The average Member State achieved only 52% of its target. Even if the shortfall is only half as much as this in 2010, the Union would only achieve a biofuels share of 4.2% in 2010. The Commission considers that this is a reasonable estimate of the likely outcome on existing policies and measures. (Estimates used in recent modelling exercises are lower: the business-as-usual scenario of the PRIMES model depicts a share of 3.9% in 2010, while the Green-X model depicts a share of only 2.4%¹¹). This judgement is also in broad accord with the view expressed in the public consultation exercise on the review of the biofuels directive: the vast majority of respondents said that they did not expect the 5.75% share to be achieved¹². The Commission's conclusion is therefore that **the biofuels directive's target for 2010 is not likely to be achieved.**

To understand what measures are needed to get biofuels moving, it is useful to look at the two Member States that have made most progress – Germany and Sweden. While Germany's success has rested mainly on biodiesel, Sweden has concentrated on bioethanol¹³. In other respects, however, their policies have several common factors. Both countries have been active in the field for several years. Both promote both high-blend or pure biofuels (giving the policy visibility) and low blends compatible with existing distribution arrangements and engines (maximising the policy's reach). Both have given biofuels tax exemptions, without limiting the quantity eligible to benefit. Both have combined domestic production with imports (from Brazil in the case of Sweden, from other Member States in the case of Germany). Both are investing in biofuel RTD and have treated first-generation biofuels as a bridge to second-generation.

⁹ Biodiesel accounted for about 80% of this, bioethanol 20% (about 15% in the form of the additive ETBE).

¹⁰ Austria, Belgium, Czech Republic, Denmark, Estonia, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Sweden and UK

¹¹ For information on these models see the impact assessment for the renewable energy roadmap, SEC(2006) 1719.

¹² A summary of responses can be consulted on http://ec.europa.eu/energy/res/legislation/biofuels_consultation_en.htm.

¹³ Sweden is also the European leader for biogas use in transport.

Tax exemptions are a longstanding form of support for biofuels. In 2005 and 2006, several Member States announced the introduction of a new form of support: biofuel obligations¹⁴. These are legal instruments requiring fuel suppliers to include a given percentage of biofuels in the total amount of fuel they place on the market¹⁵. Some Member States are using obligations as a complement to tax exemptions, others as an alternative.

There is good reason to believe that in the long run, biofuel obligations will bring down the cost of promoting biofuels – in part because they ensure large scale deployment - and will prove the most effective approach. The Commission encourages their use.

France and Austria are the only Member States to have operated a biofuel obligation for more than a few months. The French obligation, introduced in January 2005, laid down a biofuel share of 2%. However, fuel suppliers often chose to make an extra tax payment instead – an option provided for by the law; the 2% share was not achieved. The Austrian obligation was introduced in October 2005. It laid down a biofuel share of 2.5%. The obligation had an immediate effect. The share of biofuels rose to 3.2% in the last quarter of 2005, compared to less than 0.2% during the first three quarters. Both obligations are due to rise to higher levels in future years.

No data are available on the cost impacts.

The Commission will follow progress on biofuel obligations closely.

4. SENDING A SIGNAL OF THE UNION'S DETERMINATION TO REDUCE DEPENDENCE ON OIL USE IN TRANSPORT

In the light of sustained high oil prices and the evidence that biofuels provide a credible alternative fuel for transport, it is an appropriate moment to review the legal framework of the Union's biofuels policy. **There is a pressing need for the Union to send a clear signal of its determination to reduce its dependence on oil use in transport.** Biofuels are the only practical means of doing this today, and need to complement the importance of energy efficiency and modal shift in transport. A commitment to the promotion of biofuels is a means of insuring against high oil prices and reduces the consequences of supply disruptions. It is also a way to reduce the likelihood of oil prices staying as high as they are today – by showing actors in the oil market that oil-consuming countries have the will to develop a real alternative.

Legislative action in favour of biofuels will give support to national, regional and local authorities working towards the objective of reducing dependence on oil use in transport; give confidence to companies, investors and scientists who are working on more efficient ways to do this; and give pause to those who believe that European consumers will always remain hostage to oil prices, whatever the price.

¹⁴ France and Austria's obligations came into force in 2005, Slovenia's in 2006. The Czech Republic, Germany and the Netherlands have announced the introduction of obligations in 2007, the UK in 2008.

¹⁵ Biofuel mandates, under which each litre of fuel sold must contain a given percentage of biofuel, are not compatible with the EU fuel quality directive (directive 2003/17/EC amending directive 98/70/EC relating to the quality of petrol and diesel fuels - OJ L 76, 22.3.2003, p. 10).

A signal in the form of legally binding targets is stronger than a purely voluntary commitment.

A signal in the form of the adoption of a new legislative framework by the EU as a whole, with its annual market for more than 300 million tons of oil in transport, is more likely to be heard, believed and acted on than signals sent only by Member States working individually.

A collective effort by 27 Member States to develop biofuel technologies and markets is more likely to succeed, and to bring costs down, than efforts only by Member States working individually.

The Commission took the first steps towards sending such a signal in the biomass action plan of December 2005, the biofuels strategy of February 2006 and the energy Green Paper of March 2006. In their responses to these papers, the Council and European Parliament generally endorsed the proposed approach.

With a view to sending a clear signal of the Union's determination to reduce its dependence on oil use in transport, the next step should be to set minimum targets for the future share of biofuels. As set out in the renewable energy roadmap¹⁶, an appropriate level for these would be 10% in 2020.

5. THE NEED FOR EFFICIENCY IN BIOFUEL POLICY

As biofuel consumption increases, **there is a need to ensure that biofuel policy operates with a high level of efficiency**. This means:

- creating a framework which gives investors the confidence they require to invest in better, capital-intensive forms of biofuel production, and informs vehicle manufacturers of the fuels for which vehicles should be designed (it is therefore necessary to set minimum biofuel targets for 2015 and 2020);
- keeping the administrative burden on all parties to a minimum;
- encouraging the production of biofuels in ways that contribute the most to the directive's objectives of greenhouse gas savings and environmentally friendly security of supply.

The Commission is aware that before taking the next step in the promotion of biofuels, Member States and members of the European Parliament will wish to be certain that the promotion of biofuels is indeed a desirable objective. Does biofuel use really lead to a reduction in greenhouse gas emissions? Will biofuels ever be commercially viable? Is biofuel promotion compatible with protection of the environment, including biodiversity, soil conservation, water quality and air quality?

The biofuels directive's review clause requires this progress report to address these issues. Responses to the public consultation exercise on the review of the directive underline the need to do so. These are the questions that are addressed in the next section of this report. Fuller

¹⁶ COM(2006) 848.

information, addressing all the technical issues defined in Article 4(2) of the biofuels directive, is in the accompanying staff working paper.

6. THE ECONOMIC AND ENVIRONMENTAL IMPACT OF BIOFUEL PROMOTION

Inaccurate information has circulated about the economic and environmental impact of biofuels.

For example, during the 1990s, there was a tendency to evaluate the greenhouse gas impact of biofuel production purely in terms of carbon dioxide emissions. Nitrous oxide emissions caused by fertiliser use and by the cultivation of land were not taken into account. The global warming potential of nitrous oxide, weight for weight, is about 300 times that of carbon dioxide. The omission of these emissions tended, therefore, to lead to an exaggeration of the greenhouse gas benefits of biofuels.

A more recent example is the widely disseminated claim that Europe's consumption of biodiesel has caused deforestation and destruction of natural habitats in Indonesia and Malaysia to clear the way for the production of palm oil. In fact, insignificant amounts of palm oil have been used in biodiesel production – an estimated 30 000 tons in 2005¹⁷. By contrast, global palm oil production grew by nearly 10 million tons between 2001/02 and 2005/06. This increase has been driven by the food market, not the biofuel market.

While it does not look as if past biofuel expansion has contributed to deforestation in these two regions, it is clearly essential to design biofuel promotion policies so that they continue to contribute to sustainability in future, in particular if biofuel use is to increase by an order of magnitude beyond today's levels.

For the purposes of this report, the Commission therefore sought to draw up a balanced account of the economic and environmental impacts of biofuel use. It is set out in detail in the accompanying staff working paper. Drawing on this paper, the following conclusions on the economic and environmental impact of biofuel promotion can be drawn:

Costs

- The extra cost of using biofuels depends on the cost of oil, the share of imports and the competitiveness of agricultural markets. With an oil price of \$48/barrel, as in the Commission's baseline, the extra direct cost of reaching a 14% market share for biofuels (compared to the cost of conventional fuels) is estimated at €1.5-€7.2 bn in 2020. With an oil price of \$70/barrel this would fall to €5.2-€1.4 bn. However, even using the most modern technologies, the cost of EU-produced biofuels will make it difficult for them to compete with fossil fuels, at least in the short to medium term. According to the EU Strategy for Biofuel COM(2006) 34, with the technologies currently available, EU-produced biodiesel breaks even at oil prices around €60 per barrel, while bioethanol becomes competitive with oil prices of about €90 per barrel. According to the Staff Working document adopted together with this Communication, which is based on the JRC Well to Wheel analysis, the break even points for biodiesel and for bioethanol are €69-76 and €63-85, respectively.

¹⁷ Stéphane Delodder (Rabobank), Increased demand for EU rapeseed, presentation to Agra Informa conference, Brussels 24-25th October 2006.

- Second-generation biofuels are not yet commercially available (they are expected to be commercialised between 2010 and 2015) and are likely to be more expensive than first-generation. Their costs are expected to fall by 2020. In that year, both first-generation and second-generation biofuels can be expected to be in the market.

Security of supply

- Biofuels contribute to short-term security of energy supply by reducing the need to keep oil stocks to protect against disruptions. The value of this can be estimated at about €1 bn per year (under the hypothesis of a 14% biofuel share).
- The best way to promote long-term security of supply is to diversify energy sources. In transport, energy diversity is rather low. Biofuels add to energy diversity by increasing the diversity of fuel types and of regions of origin of fuels. It is not obvious how to place a monetary value on this benefit.
- Biofuels can be made from many raw materials. To achieve the greatest security of supply benefit, it is desirable to keep the range of raw materials wide. A product mix that includes domestically produced biofuels as well as imports from a variety of regions will contribute more than one that relies entirely on the lowest cost producers (Brazil for sugar cane, Malaysia and Indonesia for palm oil). It is also desirable to bring second-generation biofuels onto the market, so that an even wider range of feedstocks can be used.

Other economic impacts

- Achieving a 14% share of biofuel by 2020, if primarily through domestic production, would lead to employment in the EU being up to 144 000 higher, and EU GDP being up to 0.23% higher than they would otherwise have been¹⁸.
- European demand for biofuel imports can contribute to improving trade relations with the EU's trading partners, and provide new opportunities for developing countries which have the potential to produce and export biofuels at competitive prices.
- Trade policy measures to facilitate access to a growing EU biofuels market could contribute to finding a successful conclusion to on-going free trade negotiations.

The EU maintains significant import protection on some types of biofuels, notably ethanol which has a tariff protection level of around 45% ad valorem. Import duties on other biofuels - biodiesel and vegetable oils - are much lower (between 0 and 5%). It is at this stage unclear whether any worldwide liberalisation will take place in

¹⁸ Employment increases of 190 000 in agriculture, 46 000 in biofuel production and distribution and 14 000 in the food industry would be offset by reductions of 35 000 in services, 21 000 in the conventional fuel sector, 16 000 in transport, 14 000 in the energy sector and 22 000 in other industrial sectors. These estimates depend on assumptions about technology exports and the functioning of the oil market. If, instead, the volume of EU biofuel technology exports is independent of the volume of EU biofuel consumption, the employment figures would fall to 77 000 and 111 000 respectively. If the price of oil is unaffected by changes in demand for oil, they would fall to 13 000 and minus 32 000 respectively. (The figures quoted assume that reduced demand for oil would lead to its price falling by 1.5% and 3% respectively.)

the near future that would reduce this protection, due to the uncertainties surrounding the World Trade Organisation Doha Round. Free Trade Area negotiations are ongoing in parallel, inter alia with Mercosur, where the question of increased access to our markets for certain competitive ethanol producers is under negotiation. ACP (Africa, Caribbean and Pacific) and least developed countries as well as countries benefiting from the EU's "GSP+"¹⁹ schemes have unlimited duty-free access to the European market already. If it would appear that supply of sustainable biofuels to the EU is constrained, the EU should be ready to examine whether further market access would be an option to help the development of the market²⁰.

- The development of second-generation biofuels, through RTD and other measures, would help boost innovation and maintain Europe's competitive position in the renewable energy sector.

Greenhouse gas emissions

- First-generation biofuels, produced in Europe using the most economically attractive production method, result, on a well-to-wheel basis²¹, in greenhouse gas emissions 35-50% lower than the conventional fuels they replace. Other production methods lead to larger or smaller greenhouse gas savings. One production pathway (the production of ethanol in coal-fired plant, with by-products used for animal feed) is estimated to lead to higher greenhouse gas emissions than the conventional fuel it replaces.
- The production of ethanol from sugar cane in Brazil leads to greenhouse gas savings of about 90%. The production of biodiesel from palm oil and soya leads to greenhouse gas savings of about 50% and 30% respectively.
- Second-generation biofuel production processes, when ready to enter the market, should bring savings of the order of 90%.
- The draining of wetlands to produce any type of biofuel would produce a loss of stored carbon that would take hundreds of years to make up through the biofuels' annual greenhouse gas savings.
- If biofuels achieve a 14% market share, greenhouse gas savings of 101-103 MT CO_{2eq} per year can be expected compared to the amount saved by biofuels today.

Other environmental impacts

- If the growing of feedstock for biofuels takes place on land that is appropriate for the purpose, the environmental impact (other than greenhouse gas) of a 14% biofuel share will be manageable.

¹⁹ GSP: Generalised system of preferences

²⁰ In any event, the key EU trade policy challenge is to find ways to promote those international exports of biofuels that unambiguously contribute to greenhouse gas reduction and avoid rain forest destruction. In this respect, complementing the incentive/support system described in point 4) of section 7, certification schemes elaborated together with exporting trading partners or producers could be a way forward. But this requires further study and discussion.

²¹ Well-to-wheel calculations for transport fuels resemble lifecycle analysis but exclude emissions from the construction of manufacturing plant and equipment. In practice these are negligible.

- If increased biofuel use leads to feedstock being grown on land that is inappropriate – such as rain forest and other habitats of high nature value – it will cause substantial environmental damage. There is no need to use this land to achieve a 14% biofuel share.
- The high fuel quality and vehicle emission standards in force in the EU mean that changes in the volume of biofuel use will not have a significant impact on pollutant emissions.
- The EU fuel quality directive needs to be revised to set a step by step approach towards the use, by 2020, of significantly higher biofuel blends in ordinary vehicle engines.

7. THE WAY FORWARD

The conclusions of this review of the evidence are as follows:

- 1) In relation to the test defined in Article 4(2) of the biofuels directive, the reasons that the biofuels directive's target for 2010 is not likely to be achieved cannot be described as “justified” or as “related to new scientific evidence”.
- 2) Council and Parliament can be confident that increased biofuel use will bring substantial security of supply and greenhouse gas benefits. Increased biofuel use is the only means at present available to reduce the transport sector's near-complete dependence on oil , and one of the few ways to make a significant impact on transport's greenhouse gas emissions.
- 3) To send a clear signal of its plans to reduce its dependence on oil use in transport, the Union needs to take a new step forward in its policies for biofuel promotion.
- 4) The greenhouse gas benefits of biofuel policy can be further increased, and environmental risks minimised, through a simple system of incentives/support that, for instance, discourages the conversion of land with high biodiversity value for the purpose of cultivating biofuel feedstocks; discourages the use of bad systems for biofuel production; and encourages the use of second-generation production processes. The system should be designed to avoid any discrimination between domestic production and imports and should not act as a barrier to trade. Its impacts should be assessed and its operation should be monitored with a view to making it more sophisticated in future.
- 5) This system should be designed in a way that does not reduce security of supply benefits. These flow from diversity of energy sources, biomass types and import regions. Therefore, the system should not favour one biofuel type or crop rather than another. Instead, it should encourage environmentally benign biofuel production practice across all biofuel types and crops, including in third countries.

To move from the current biofuel share of 1% to a share of 10%, the following steps will be needed:

- Staged modifications of the fuel quality directive and the diesel standard²², taking account of technological development while respecting air quality objectives, permitting the routine use of biofuel blends of a significantly higher level than at present.
- The inclusion in new vehicles of the (cheap²³) adaptations they need to cope with these higher blends.
- The putting on sale by the oil industry of a low vapour pressure petrol basestock – or a modification of the fuel quality directive to take into account the vapour pressure changes caused by the inclusion of low blends of ethanol in petrol.
- Availability of second-generation biofuels (if the EU car fleet continues to shift from petrol to diesel, the commercialisation of BTL will be particularly important).
- The introduction of wood farming, and further development of rape seed cultivation, in the EU and its neighbours to the east.
- Measures to guarantee the environmental credentials of biofuels, including discouraging the use of biofuels that create more greenhouse gas emissions than they save or lead to major biodiversity loss; regular monitoring and reporting, by the Commission, of the well-to-wheel environmental impact of biofuels' production and use.
- The continuing implementation of the balanced approach to international trade in biofuels, so that both exporting countries and domestic producers can invest with confidence in the opportunities created by the growing European market.

As shown in the impact assessment for the renewable energy roadmap, a 10% biofuel share in 2020 can be achieved with limited reliance on second-generation biofuels. Development of second-generation biofuels will, however, improve the greenhouse gas and security of supply impact of achieving this share; and it will make it easier to achieve shares that are even higher. As well as support from Community and national RTD programmes, the development of second-generation biofuels also needs market-based incentives and the establishment of a medium term framework for biofuel promotion.

The amendment of the biofuel directive will not in itself make these things happen. They will require sustained effort on the part of industry, agriculture and Member States as well as the EU. But without the framework that amendment of the directive would create, there is little or no probability of these steps taking place.

²² Standard EN590.

²³ For example, cars capable of coping with ethanol blends of up to 85% are sold in Sweden at comparable prices to ordinary cars. Cars capable of coping with ethanol blends between 0 and 100% are sold in Brazil at similar or identical prices to ordinary cars, and accounted for about 80% of the new cars sold there in 2006.

8. PROPOSAL FOR REVISION OF THE BIOFUELS DIRECTIVE

The EU needs to revise the biofuels directive to:

- send a signal of its determination to reduce its dependence on oil use in transport and move to a low carbon economy;
- set minimum standards for the share of biofuels in 2020 (10%) ;
- ensure that the use of poor-performing biofuels is discouraged while the use of biofuels with good environmental and security of supply performance is encouraged.

The Commission will bring forward a proposal to do this during 2007.

Annex 1: Progress in the use of biofuels in the Member States, 2003-2005

Member State	Biofuel share 2003 (%)	Biofuel share 2004 (%)	Biofuel share 2005 (%)	National indicative target 2005 (%)
Austria	0.06	0.06	0.93	2.50
Belgium	0.00	0.00	0.00	2.00
Cyprus	0.00	0.00	0.00	1.00
Czech Republic	1.09	1.00	0.05	3.70 ²⁴
Denmark	0.00	0.00	no data	0.10
Estonia	0.00	0.00	0.00	2.00
Finland	0.11	0.11	no data	0.10
France	0.67	0.67	0.97	2.00
Germany	1.21	1.72	3.75	2.00
Greece	0.00	0.00	no data	0.70
Hungary	0.00	0.00	0.07	0.60
Ireland	0.00	0.00	0.05	0.06
Italy	0.50	0.50	0.51	1.00
Latvia	0.22	0.07	0.33	2.00
Lithuania	0.00	0.02	0.72	2.00
Luxembourg	0.00	0.02	0.02	0.00
Malta	0.02	0.10	0.52	0.30
The Netherlands	0.03	0.01	0.02	2.00 ²⁵
Poland	0.49	0.30	0.48	0.50
Portugal	0.00	0.00	0.00	2.00
Slovakia	0.14	0.15	no data	2.00
Slovenia	0.00	0.06	0.35	0.65
Spain	0.35	0.38	0.44	2.00
Sweden	1.32	2.28	2.23	3.00
UK	0.026 ²⁶	0.04	0.18	0.19 ²⁷
EU25	0.5%	0.7%	1.0% (estimate)	1.4%

Source: national reports under the biofuels directive.

²⁴ 2006.

²⁵ 2006.

²⁶ 0.03% in volume terms, equating to 0.26% in energy content, assuming 100% biodiesel.

²⁷ 0.3% in volume terms, equating to 0.19% in energy content, assuming 50:50 split between biodiesel and bioethanol.

Annex 2: National indicative targets for the share of biofuels, 2006-2010

%	2006	2007	2008	2009	2010
Austria	2.50	4.30	5.75	5.75	5.75
Belgium	2.75	3.50	4.25	5.00	5.75
Cyprus					
Czech Republic	1.78	1.63	2.45	2.71	3.27
Denmark	0.10				
Estonia	2.00				5.75
Finland					
France			5.75		7.00
Germany	2.00				5.75
Greece	2.50	3.00	4.00	5.00	5.75
Hungary					5.75
Ireland	1.14	1.75	2.24		
Italy	2.00	2.00	3.00	4.00	5.00
Latvia	2.75	3.50	4.25	5.00	5.75
Lithuania					5.75
Luxembourg	2.75				5.75
Malta					
The Netherlands	2.00	2.00			5.75
Poland	1.50	2.30	28	29	5.75
Portugal	2.00	3.00	5.75	5.75	5.75
Slovakia	2.50	3.20	4.00	4.90	5.75
Slovenia	1.20	2.00	3.00	4.00	5.00
Spain					
Sweden					5.75
UK			2.00 ³⁰	2.80 ³¹	3.50 ³²
EU					5.45³³

Source: national reporting under the biofuels directive except France: response to public consultation on review of the biofuels directive.

²⁸ Will be set by 17 June 2007.

²⁹ Will be set by 17 June 2007.

³⁰ 2.5% in volume terms, assuming 100% biodiesel.

³¹ 3.75% in volume terms, assuming biodiesel at 66% of total biofuel sales.

³² 5% in volume terms.

³³ Share for those Member States that have reported a target for 2010.