

**Opinion of the European Economic and Social Committee on the 'Proposal for a Directive of the European Parliament and of the Council on the suppression of radio interference produced by agricultural or forestry tractors (electromagnetic compatibility)' (Codified version)**

COM(2007) 462 *final* — 2007/0166 (COD)

(2008/C 44/09)

On 5 September 2007 the Council decided to consult the European Economic and Social Committee, under Article 95 of the Treaty establishing the European Community, on the abovementioned proposal.

Since the Committee unreservedly endorses the proposal and feels that it requires no comment on its part, it decided, at its 439th plenary session of 24 and 25 October 2007 (meeting of 24 October), by 153 votes to 1 with 8 abstentions, to issue an opinion endorsing the proposed text.

Brussels, 24 October 2007.

The President  
of the European Economic and Social Committee  
Dimitris DIMITRIADIS

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**Opinion of the European Economic and Social Committee on the 'Communication from the Commission to the Council and the European Parliament 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'**

COM(2006) 845 *final*

(2008/C 44/10)

On 10 January 2007 the Commission decided to consult the European Economic and Social Committee, under Article 262 of the Treaty establishing the European Community, on the abovementioned proposal.

The Section for Transport, Energy, Infrastructure and the Information Society, which was responsible for preparing the Committee's work on the subject, adopted its opinion on 5 September 2007. The rapporteur was Mr Iozia.

At its 439th plenary session, held on 24 and 25 October 2007 (meeting of 24 October), the European Economic and Social Committee adopted the following opinion by 142 votes to 13 with eight abstentions.

**1. Conclusions and recommendations**

— ensuring the competitiveness of European economies and the availability of affordable energy;

1.1 The Committee takes issues relating to energy efficiency, climate change and reducing greenhouse gas emissions very seriously, and in general agrees with the conclusions of the Spring European Council of 8 and 9 March, drawing attention to the three pillars of the Energy Policy for Europe:

— promoting environmental sustainability and combating climate change.

— increasing security of supply;

1.2 In its Biofuels Progress Report, the Commission points out that without mandatory objectives, it will be impossible to achieve a satisfactory level of biofuels use. It argues that the target of a 5,75 % market share by 2010 is not realistic and that

consequently, in order to meet the requirements laid down by the Council, an objective of 10 % by 2020 — considered by the Commission to be achievable — should be set, using the possibility offered by Article 4(2) of Directive 2003/30/EC, known as the 'review clause'. Strangely enough, the Commission points to the benefits of a scenario in which use of biofuels stands at 14 %, although the declared objective is 10 % — the communication indulges in a display of window-dressing, suggesting unrealistic results.

1.3 The use of first-generation biofuels, however, entails many difficulties, and they do not fully meet European aims. The production costs are high, as are the environmental costs, they take cereals away from human and animal consumption and, as argued by the FAO, they are in part responsible for increasing cereal prices on world markets.

1.4 The use of biofuels therefore raises ethical issues, such as food-fuel competition, which the Commission seems to minimise. The Committee underlines the need for closer cooperation with global institutions and agencies working in the sphere of agriculture and food, such as the FAO and the WFP (World Food Programme).

1.5 Neither the Commission document nor the attached impact study mention some serious difficulties.

Particular attention should be given to the following problems concerning biodiesel:

- limited productivity,
- high cost (EUR 0,4-0,7/L),
- stability problems (presence of oxygenated groups), resulting in storage problems.

Ethanol, in turn, is affected by the following problems:

- limited productivity (albeit less than for biodiesel),
- high consumption of water and fertilisers,
- unsuitability for transit through existing pipelines for oil-based fuels (corrosion problems).

1.6 The Committee emphasises the need for the social, environmental and economic impact of the development of biofuels, together with the related technical issues, to be carefully assessed. The specific question arises of the biofuel yield from raw materials: 1 tonne of beet yields some 400 litres of bioethanol (approximately 1 500 Mcal). Given the energy required to convert biomass into biofuel, this ratio appears uneconomic and inefficient. It would be far more efficient to use biomass directly to produce electrical energy or heating, or for maritime or urban public transport.

1.7 The Committee points out that, from a strictly environmental point of view, thought needs to be given to risks of

deforestation and those arising from the storage of raw materials. The related biological and biochemical issues must be clearly and carefully examined.

1.8 The Committee would also raise an issue of 'scientific ethics'. Planet Earth is an open system, inexorably declining towards a point of equilibrium which will signal its end. It is the responsibility of scientists to slow this downward trend, and it is the responsibility of politics to facilitate the necessary work and studies.

1.9 The Committee recommends that a serious analysis be carried out to find out if the chemical processes of combustion involving molecules other than hydrocarbons may cause the formation and development of free radicals responsible for oxidative stress, which is considered to be a pathological state preliminary to more serious illnesses. This recommendation is justified by the lack of data available in this area.

1.10 The Committee considers special care and protection of the soil to be essential. It must be protected, as it protects us. The progressive contraction and deterioration of the water-bearing strata is caused by misguided exploitation policies and impoverishment of the soil. Crop rotation should be guaranteed in order to facilitate soil recovery.

1.11 The Committee urges the Commission and all the European institutions to focus closely on water consumption in the production of biofuels. Among the many harmful effects of climate change, shrinking water resources may reach crisis proportions in some regions. Recent IWMI studies have calculated that a minimum of 1 000 litres, and possibly as much as 4 000 litres of water are needed to produce one litre of biofuel, depending on the type of product and the area of production.

1.12 Apart from these concerns, which could be alleviated if monitoring and certification measures were to be adopted covering biofuels production methods, in part by means of product traceability, the Committee believes that further support should be given to research and development of second- and even third-generation biofuels such as biobutanol. Biobutanol has low vapour pressure and shows tolerance to water contamination in petrol blends, facilitating its use in existing petrol resupply and distribution channels. Biobutanol can be mixed with petrol in higher concentrations than existing biofuels, with no need to modify vehicles. Furthermore, it offers higher fuel economies than petrol-ethanol blends, thus improving energy efficiency and reducing consumption per litre. The new generation fuels provide high energy yields and low environmental costs by using refuse and biochemistry to facilitate natural processes for breaking down cellulose, which are complex and costly.

1.13 The Committee also believes that the development of biofuels could provide the European economy with opportunities, and thereby help to achieve the objectives of the Lisbon agenda. The 7th Framework Programme specifically provides for this type of action, but better synergies are needed between the various stakeholders: farm producers and the processing industry, but also environmental and local area conservation associations, and workers' organisations, who have a growing interest in combining sustainable development with ever-more advanced models for corporate social responsibility.

1.14 The opportunities that the farming sector detects in the development of biofuels should be encouraged, insofar as farmers also undertake to help protect primary environmental assets and safeguard shared resources, such as water and food for human and animal consumption. It is the task of farmers' associations to keep rural communities informed about any rules devised by the international community to govern the production and sale of biofuels. The dissemination of certification, traceability and conformity control practices are all topics on which the various agricultural organisations are expected to offer vital input, both at European level and nationally and locally. The Committee is willing to cooperate with national ESCs — which have previously expressed a lively interest, and are providing input for some of the Committee's own opinions — in this area and in others regarding energy efficiency, reducing greenhouse gas emissions and climate change.

1.15 On the question of tax treatment, it is clear that the range of candidates for public assistance is endless — especially as regards duties on biofuels and assistance for farmers, for the car industry in sustaining the necessary research expenditure, for consumers regarding the work required on vehicles not designed to use biofuels, and for biofuel manufacturers. Germany has recently cut its tax incentives significantly, triggering an immediate fall in consumption, and equally prompt protests from industry. Investment requires certainty and stability, but the biofuels markets are still virtually non-existent. Any aid granted, however, must not serve to distort competition.

1.16 The transport sector, for its part, is not subject to the emissions quotas system. The Committee suggests that the Commission examine the possibility of extending the emissions certificates system to transport, as they may provide a further spur to enhance efficiency in the search for new solutions to reduce harmful emissions. The Committee is preparing a working hypothesis in a specific exploratory opinion, requested by Commission vice-president Barrot.

1.17 The Committee agrees with the EP resolution on a strategy for biomass and biofuels, which calls on the Commis-

sion to introduce a mandatory and comprehensive certification scheme allowing the sustainable production of biofuels at all stages, and to support the development and use of the Global Monitoring for Environment and Security (GMES) system to monitor land use in the production of bioethanol so as to prevent the destruction of rainforests and other negative impacts on the environment.

1.18 In view of the problems identified in this opinion, the Committee urges the Commission to keep the 10 % target under continuing review, and to be ready to bring forward proposals to modify it if the problems cannot be resolved in a satisfactory and sustainable way.

## 2. The Commission communication

2.1 The Commission introduces its *Report on the progress made in the use of biofuels* by emphasising the fact that, for the 2005-2020 period, an increase in greenhouse gas emissions (in this case only CO<sub>2</sub>) of 77 million tonnes per annum is expected in the transport sector alone, accounting for more than 60 % of the total increase in emissions, which is expected to reach 126 million tonnes per annum.

2.2 Another key factor highlighted is transport's almost complete dependence on oil imports, which is the energy source presenting the most acute security of supply challenge. Such dependence would diminish if the use of biofuels were to increase significantly.

2.3 The benefits of developing biofuels in terms of reduced greenhouse gases will not be felt if, for example, existing crops are converted or land rich in biodiversity (such as rainforest) is used.

2.4 The market share of biofuels was 0,3 % in 2001, and only five Member States had any experience in their use. While not laying down any obligations, Directive 2003/30/EC set a target for 2010 of a 5,75 % share of the market for petrol and diesel in transport, with an interim target of 2 % for 2005.

2.5 Article 4(2) of the directive contains a review clause enabling the Commission to submit proposals for mandatory national targets in the event of significant and unjustified slippage with respect to the 2 % target.

2.6 The Common Agricultural Policy has a key role to play, especially since the 2003 reform. By decoupling the payments made to farmers from the crops produced, the reform has allowed set-aside land to be switched to non-food crops, frequently for the production of biofuels.

2.7 A premium for 'energy crops' will be paid in 2007, combined with policies to promote the production of wood energy and support for renewable energies under rural development policy (<sup>1</sup>).

2.8 The use of biofuels has grown significantly, but only two Member States reached the targets set, the overall result being 1 % in 2005 — 1,6 % for biodiesel and 0,4 % for ethanol. On this basis, the Commission concludes that the 5,75 % target for 2010 will not be achieved.

2.9 Experience shows that positive results have been achieved through both tax incentive policies, with no limits on the amounts eligible, and by obliging suppliers to put a specified percentage of biofuels on the market. The Commission considers that obligations represent the most effective approach.

2.10 The Commission states in its communication that: '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'. It views biofuels as the only practical means of insuring against high oil prices.

2.11 This signal must be in the form of legally binding targets if it is to carry any weight with the oil producers, who sell 300 million tonnes of oil on the EU market in the transport sector alone.

2.12 The strategy most likely to succeed is to promote joint research and technological development in the 27 Member States. A 10 % market share by 2020 would be a realistic target.

2.13 A clear legal framework, with the minimum administrative burden, setting intermediate objectives — e.g. for 2015 — is essential if vehicle manufacturers are to be able to adapt their design processes.

2.14 In analysing the economic and environmental impact, a number of scenarios are presented in connection, on the one hand, with the evolution of oil prices, imports and the competitiveness of agricultural prices and, on the other, with the development of new technologies that might spur the growth of 'second-generation' biofuels, helping to reduce the environmental cost.

2.15 In cost terms, an assumed increase in the use of biofuels to reach 14 % would generate additional costs of between EUR 11,5 and 17,2 billion in 2020 with an oil price around the USD 48/barrel mark, and between EUR 5,2 and 11,4 billion at USD 70/barrel. The break-even points for biodiesel and bioethanol lie in the EUR 69-76/barrel and

EUR 63-85/barrel ranges respectively (USD 92,76-102,18/barrel and USD 84,76-114,28/barrel, at an exchange rate on 25 May 2007 of USD 1,3444 to the Euro).

2.16 The reduced cost of storing reserves — still working on the 14 % in 2020 hypothesis — would produce savings of up to EUR 1 billion (EUR 720 million with the 10 % scenario). A supply mix from third countries and Member States represents the best solution, together with the desirable arrival on the market of second-generation biofuels.

2.17 This scenario would have positive effects on employment, creating 144 000 more jobs (100 000 under the 10 % scenario) if bioethanol production is primarily domestic, and would also boost Community GDP (growth of 0,23 %). Lastly, the positive effects of research, particularly into second-generation biofuels, could sustain competitiveness in the renewable energy sector.

2.18 Using the 'well-to-wheel' method, the Commission calculates that employing the optimum, most economically advantageous techniques, a reduction in greenhouse gas emissions of 35-50 % could be achieved. Ethanol produced from sugar cane in Brazil cuts these emissions by 90 %, and biodiesel from palm oil and soya leads to savings of 50 % and 30 % respectively. The production of second-generation biofuels should bring about savings of 90 %. The 14 % scenario should result in savings in greenhouse gas emissions of around 101-103 million tonnes CO<sub>2</sub>eq per year (or 71-75 mT CO<sub>2</sub>eq under the 10 % scenario).

2.19 In the communication, a 14 % share is reckoned to be manageable from the environmental impact point of view, provided that production is not from inappropriate land such as rainforest or habitats of high environmental value.

2.20 The Commission concludes its review by maintaining that greater biofuel use will bring substantial greenhouse gas emission benefits, and that security of supply will increase. A targeted incentives/support policy should neutralise the risks of using land with high biodiversity value or bad systems for biofuel production, by encouraging the use of second-generation processes.

2.21 The following will be needed in order to achieve these objectives:

(<sup>1</sup>) So far the figures are the same as for last year, with no increase, and recently the Commission expressed doubts as to whether the premium would be maintained in 2008.

— a review of the diesel standard (EN 590) and probably the petrol standard (EN 228) to make it easier to blend biofuels with fossil fuels;

- introduction of (low-cost) adaptations to new vehicles;
- development of BTL (biomass to liquid) technologies;
- introduction of wood farming and rapeseed cultivation;
- constant monitoring of the environmental impact.

2.22 Lastly, the Commission proposes to revise the biofuels directive, to set a 10 % minimum standard for the share of biofuels in 2020, and to assure the use of efficient and environment-friendly biofuels.

### 3. Biofuels: a few technical points

3.1 Biodiesel is obtained by crushing rape, soya and sunflower seeds, and by a transesterification reaction which results in the original alcohol components (glycerol) being replaced with methyl alcohol (methanol). Bioethanol is an alcohol (ethanol or ethylic alcohol) obtained through a fermentation process using various agricultural products rich in carbohydrates and sugars such as cereals (maize, sorghum, wheat, barley), sugar crops (beet and cane), fruit, potatoes and marcs. Products obtained by the chemical combination of molecules of biological origin with molecules of fossil origin are also considered to be biofuels. The main example of this is provided by ETBE, ethyl tertiary butyl ether, obtained by a bioethanol and isobutene reaction.

3.2 Ethanol has the qualities of an excellent fuel: it has a high octane count and can be blended (E5, E10) without requiring major adjustments to engines, although specific engines are necessary for more substantial use (E85).

3.3 The main difficulties in the use of ethanol arise from blending with petrol. Even at low ethanol percentages, vapour pressure rises significantly (approximately 10 kPa) as do, consequently, evaporate emissions. Ethanol's affinity for water can lead to problems with the product's final quality. Blends of ordinary hydrocarbon petrols with petrols containing ethanol should be avoided: a separate logistics and distribution chain should be used for the latter.

3.4 Blends of biodiesel and conventional diesel can be used in diesel engines. In European countries, a blend of up to 5 % (B5) is widely used in standard quality diesel, with no compatibility problems having arisen. Fuels with a high biodiesel content (more than 8-10 %) may cause problems for vehicles with engine seals made of incompatible polymer materials. The most serious difficulties arise in particulates and fine dust filters, which require major and costly modifications. For this reason,

some manufacturers have already adjusted their vehicle specifications, while others restrict their guarantee cover to B5 blends. Because of their hygroscopic characteristics, detergency and low storage stability, high-percentage blends may require special measures to be taken for vehicles and product distribution systems.

3.5 The Commission convincingly addresses the need to promote the development of biofuels with greater determination. Realistically, it does not consider that it will in the future be possible to replace current petrol production (1,2 billion tonnes worldwide in 2004) with biofuels (46 million tonnes in 2005, of which 3 million in the EU, as shown in the table below), but aims at a minimum biofuels share of at least 10 % in addition to existing fuels in a little more than 13 years, to be achieved through a directive and individual targets for each Member State.

	2005	Litres, millions
USA		16 130
Brazil		15 990
China		3 800
India		1 700
EU		2 900
Others		5 480

3.6 Hydrogen, which is already being used — at least experimentally — as an energy vector by some European car manufacturers, is still produced essentially by electrolysis, or by extraction from natural gas or other fossil fuels. This would not produce any greenhouse gas reductions. In spite of the recent development of research geared to producing hydrogen from biomass, sometimes with the use of biotechnologies or renewable sources, the potential widespread use and marketing of hydrogen-fuelled cars is also determined by the high cost of the fuel cells. For hydrogen to become an economically practicable alternative energy source, production costs must be brought down. Current research at the University of New South Wales has set out to meet this aim by using individual ceramic solar panels made of titanium oxide. Titanium is a highly popular option in the solar hydrogen field: it has the right semiconductor characteristics and is water-resistant. In its natural, unmodified state, however, it is not yet efficient enough.

#### 4. General comments

##### *A few difficulties*

4.1 While demonstrating the possible benefits, the Commission avoids drawing attention to the problems and difficulties involved in developing biofuels, although some warnings do occasionally emerge. In contrast, the Committee believes that the Commission's proposal must be closely and carefully analysed so that by resolving one problem, further more serious ones are not created, and to prevent only the 'pros' being highlighted to the exclusion of the 'cons'. It is rather strange that the unrealistic scenario of a 14 % share by 2020 is used in order to emphasise the benefits of the proposal! The benefits in the event of the 10 % target being met would objectively be more modest.

4.2 Neither the Commission document nor the attached impact study identify any serious difficulties. For instance, the disposal of the waste matter from biofuel production should be modernised and reviewed in the light of new biofuel cell systems and production-related electronic technologies.

4.3 Attention is drawn to the following aspects concerning biodiesel:

- limited productivity;
- high cost (EUR 0,4-0,7/L);
- stability problems (presence of oxygenated groups), resulting in storage difficulties.

4.4 And for bioethanol:

- limited productivity (albeit less than for biodiesel);
- high consumption of water and fertilisers;
- unsuitability for transit through existing pipelines for oil-based fuels (corrosion problems).

The benefits, meanwhile, include the possibility to increase the crop cycle, alternating traditional human and animal food crops with other specific crops destined for biomass and energy production. This must be developed with an eye to regional crops. In any case, European crops are subject to regulations regarding soil protection and the use of fertilisers.

4.5 Biofuels need the right crops, grown on a large scale. This entails sacrificing other crops that are necessary in order to meet the requirement on the part of the poorer countries for foodstuffs at the lowest possible cost. The possibility of using cellulose to produce biofuels is interesting, but it should be pointed out that production requires chemical and physical pretreatment (a sort of explosion of its mass) to make it reactive to bioprocessing. The issue of residues and of the catalysts used also needs to be highlighted, as they complicate the question of waste disposal downstream of the processing.

4.6 For large-scale use, glycerol — unrefined, pure or blended with other fuels — may be envisaged. The disadvantages of this alternative need to be set out: the cost of glycerol if used pure, the cost of processing if used unrefined, its low calorific yield and, in all cases, the need to break down the toxic substances formed during combustion (mainly acrolein, also known as acrylic aldehyde).

4.7 Another approach could be based on genetic modification of certain organisms best placed to render certain crops particularly suitable for bioprocessing, with high yields and consequently low energy consumption during production. Genetic engineering could also be applied to modify organisms which can make it easier to use cellulose.

4.8 From the technical point of view, there is also the question of the biofuel yield from raw materials: 1 tonne of beet yields some 400 litres of bioethanol (approximately 1 500 Mcal). Is this figure sufficient to justify an overall positive assessment, given the possible environmental risks and disadvantages resulting from the adoption of this type of energy?

4.9 A further aspect not to be underestimated concerns the extraction processes and their selectivity, and the fermentation processes which are relatively costly if carried out with maximum attention to the quality of the finished product. Moreover, the possible presence of impurities in the fuel could, when used, give rise to higher economic losses in connection with secondary reactions, the quality of the fuel obtained, and the characteristics of the waste and residues produced.

##### *Environmental protection*

4.10 From a strictly environmental point of view, thought needs to be given to risks of deforestation (as is currently the case in Malaysia and Indonesia, due to palm oil production, and in Malawi and Uganda on account of the development of *jatropha*, in areas intended for food production or particularly valuable rainforest zones) and those arising from the storage of raw materials. The related biological and biochemical issues must be clearly and carefully examined.

4.11 There is also an 'ethical' aspect which needs to be further assessed: competition between food and fuel. The prices of high-grade raw materials such as wheat, maize and rice are rising inexorably as a result of the growing demand from biofuel 'distilleries' (FAO and WFP 2007 Report). In Mexico, the price of *tortillas* has risen by 60 %, sparking public unrest and protests. Since the beginning of the year, in China, the rising price of soya has driven meat prices up by 43 % and egg prices up by 16 %. The prices of maize and oats have risen by 40 % and 20 % respectively. In India, cereal prices have increased by

10 %, with wheat rising by 11 %. According to the US Department of Agriculture, the United States too will see price rises of 10 % for poultry, 21 % for eggs and 14 % for milk. If, in the future, the fuel value of cereals exceeds their food value, the market will turn to the energy economy — and food prices will rise with oil prices, increasing the risk of food shortages, even in Europe.

4.12 The growth of production plants (in the United States alone, 79 plants are under construction, in addition to the 116 currently in operation) will trigger an exponential increase in cereals consumption, estimated by the EPI (Earth Policy Institute) at some 139 million tonnes, twice the US Department of Agriculture's forecast. Since yields stand at 110 gallons (416,19 litres) of ethanol per tonne of maize (slightly more than four full tanks for an SUV), the issue assumes truly worrying proportions.

4.13 In a recent opinion <sup>(2)</sup>, the Committee also stressed the need to safeguard biodiversity, especially the rainforest, which not only constitutes the habitat of fauna which would otherwise inevitably disappear, but also represents the planet's only and last 'lung'. The intensive cultivation of sugar cane in Brazil and palm trees in Malaysia and Indonesia, which every day sacrifices hundreds of hectares of forest to single-crop farming, must be stopped.

4.14 There is also an issue of 'scientific ethics'. Planet Earth is an open system, inexorably declining towards a point of equilibrium which will signal its end. It is the responsibility of scientists to slow this downward trend, and it is the responsibility of politics to facilitate the necessary work and studies.

4.15 The costs — not only economic, but also environmental and health-related — must be clearly identified. Serious efforts are needed to evaluate and study the impact accurately.

4.16 With regard to the chemical processes of combustion involving molecules other than hydrocarbons, a careful examination should be made of the possible formation and development of free radicals as a result of oxidative stress in the processes (free radicals are one of the main causes of oncological pathologies). No reliable data on their possible increase as a result of biofuels production are available.

4.17 Care and protection of the soil is crucial. It must be protected, as it protects us. The progressive contraction and deterioration of the water-bearing strata is caused by misguided exploitation policies and impoverishment of the soil. Crop rotation should be guaranteed in order to facilitate soil recovery.

<sup>(2)</sup> EESC opinion on the Communication from the Commission on *Halting the loss of biodiversity by 2010 — and beyond — Sustaining ecosystem services for human well-being* — OJ C 97, 28.4.2007.

#### Food security

4.18 The 33rd session of the FAO's Committee on World Food Security, held in Rome from 7 to 10 May 2007, gives over a major chapter (point 45) to this issue, stating that: 'Bioenergy offers both opportunities and risks for each of the four dimensions of food security: availability, access, stability and utilisation. The food security implications of bioenergy will be shaped by the scale and type of system under consideration, by the structure of commodity and energy markets, and by policy choices in the areas of agriculture, energy, environment and trade. Technological change in the bioenergy sector is occurring rapidly and represents an additional major source of uncertainty regarding food security'.

4.19 In the same report, the FAO emphasises that 'the most prominent feature of the food and feed markets in 2006 has been the surge in prices of cereals, in particular wheat and maize, which, by November, had reached levels not seen for a decade. Poor harvests in key producing countries associated with a fast growing demand for biofuel production have been the main drivers of the grain markets. Supply constraints also have dominated the rice economy'.

4.20 China too has recently taken steps to reduce the production of ethanol from maize, as reported by Asia Times Online on 21 December 2006. 'In China the first thing is to provide food for its 1,3 billion people, and after that, we will support biofuel production' declared Wang Xiaobing, an Agriculture Ministry official.

4.21 On 20 July 2007, the Italian newspaper *La Repubblica* published an article entitled 'Biofuel vs. spaghetti war'. Pasta prices are set to rise by 20 % owing to a biofuel maize boom. The price of durum wheat, the main ingredient in Italian pasta, has risen by more than 30 % as farmers shift to maize crops for bioethanol. At the Chicago exchange the price of a bushel (27 kg) of wheat shot up from USD 3,6404 on 3 April to USD 5,64 on 14 June. Italians are likely to feel the effect of these price changes keenly as they are the world's biggest consumers (28 kg per capita a year) and producers (3.2 million tonnes) of durum wheat.

#### Water

4.22 Water consumption in biofuels production is another aspect not receiving enough attention. The most recent research by the International Water Management Institute (IWMI), published on 10 May 2007, shows that, in Sri Lanka for example, 1-4 000 litres of water are needed to produce one litre of ethanol, depending on the type of plant and production techniques used. In Brazil, it is calculated that 2 200 litres of water are required for one litre of ethanol, while in India — where

rainfall is not abundant and irrigation must be used — the same litre of ethanol needs 3 500 litres of irrigation water! These figures have been confirmed by the UNESCO-IHE Institute for Water Education in Delft, which is working with the local university, founded in 2003, and also by recent studies conducted by the University of Colorado agrarian studies faculty, which is developing a special maize strain that needs less water. These data can also be viewed on the following website: [www.waterfootprint.org](http://www.waterfootprint.org).

4.23 In Europe, those worst affected by water problems are the southern regions. They have suffered water shortages for many years and, with temperature rises and resulting evaporation, these difficulties are set to continue, while for now at least the northern regions do not appear to be concerned.

#### The cost

4.24 The following table (presented by Mr Mario Marchionna of the ENI at a recent seminar held by AIDIC — the Italian Association of Chemical Engineering) compares the cost of fossil fuels and biofuels, for equivalent energy.

### Cost comparison of biofuel components

(equivalent energy value)

Reference price: Brent = 70 (56) \$/bl

Fuel	Equivalent €¢/lt
<u>Petrol</u> <sup>(1)</sup>	39 (31)
<u>Bioethanol</u>	
EU	75
Brazil	39
US	47
Italy (Val Padana)	70-75
<u>Diesel</u> <sup>(2)</sup>	46 (37)
<u>Biodiesel</u>	
EU	78
Malaysia	48
US	60
Italy	78

<sup>(1)</sup> Platt's Mediterranean CIF High is used for petrol.

<sup>(2)</sup> Platt's Mediterranean CIF High is used for diesel.

4.25 The Commission estimates that 18 million ha of arable land would be needed in order to produce the necessary biofuels within the EU to reach the 10 % target by 2020:

- 7 million ha of uncultivated land,
- 7 million ha by converting land used for cereal crops with export subsidies,
- 4 million ha to be taken out of agricultural use.

#### Benefits for poor countries?

4.26 The Commission states that developing the use of biofuels will bring significant benefits, especially to the developing countries, which can step up their production geared to exports. African farmers, however, are expressing concern about the economic return on the investments made so far. The 10 May 2007 issue of *African Agriculture*, raises some serious questions in an article on *Is jatropha excitement a mirage?* (the jatropha is a bush yielding oilseeds that are toxic to humans but produce reasonable-quality biodiesel, and that do not require special care).

4.27 African environmental associations are also making their voices heard, as reported in the *East African Business Week* (an online journal produced by Kenya's leading publishing group, Nation Media Group) of 7 May 2007. Deforestation is increasing by 2,2 % yearly, compared to a world average of 0,2 % — at this rate the country will have no forest left by 2040. A group of civil society activists has set up the 'Save Mabira' coalition, named for a forest that the Ugandan government has decided to hand over to the Sugar Corporation of Uganda Ltd to increase the amount of land for sugar cane cultivation, earmarked for bioethanol. Some 7 100 ha, or one quarter of the virgin forest, the biggest in the country, will be sacrificed to produce a few tonnes of bioethanol, that might even end up being used in eco-friendly buses in Europe!

4.28 The Commission has virtually nothing to say in this regard, simply mentioning in passing that both the use of food crops and the use of land of high nature-related value must be countered in some way, relying on deterrent economic policies to solve the problem. It is frankly difficult to detect any sign of courage on the Commission's part here. The Committee is highly concerned at the environmental risks arising from the proliferation of GMO crops which, if used for these purposes, might seem to be more acceptable. The risk of GMO propagation is real, and their use can only be assessed once all the scientific research into their possible dangers has been completed; in any case, the EU's remaining biodiversity must be preserved.

4.29 The Committee considers it essential to step up cooperation with international bodies concerned with combating hunger in the world, especially the FAO and WFP (World Food Programme), and regrets that in its impact assessment, the Commission decided not to enter into contact with these international agencies, which are carrying out serious work on the



subject without obscuring all the problems and risks arising from the development of biofuels, especially in terms of consumption of water resources.

#### *The European Council*

4.30 The Committee notes the conclusions of the Spring Council of 8 and 9 March 2007, which devoted considerable attention to the Energy Policy for Europe (EPE), whose three main objectives are to:

- increase security of supply;
- ensure the competitiveness of European economies and the availability of affordable energy;
- promote environmental sustainability and combat climate change.

4.31 The European Council supports and adopts the Commission's proposals on energy in general, and on biofuels in particular, although the wording used with respect to the 10 % obligation leaves considerable room for doubt: 'The binding character of this target is appropriate subject to production being sustainable, second-generation biofuels becoming commercially available and the Fuel Quality Directive being amended accordingly to allow for adequate levels of blending'.

4.32 It will be extremely important to understand how these provisos may be used effectively by the Member States. In particular, reference to the market availability of second-generation biofuels currently seems problematic. It would be extremely costly to convert existing first-generation biofuel-producing plants, those in an advanced phase of construction and those planned for the coming years, as their processes are very different to those necessary for second-generation fuels. If these fuels are not available, the Council decision will not be binding. As regards sustainability, additional European legislation will be required alongside the existing directives to ensure that biomass production responds strictly to fixed requirements and that biofuel crops are not in competition with human and animal food crops. As for the necessary changes to the directive on fuel quality, the procedure is somewhat complex and will require the full attention of the standards bodies, the CEN in particular, to analyse the problems relating to technical specifications.

#### *Second-generation biofuels*

4.33 For second-generation biofuels, a number of solutions for ethanol production are already possible, through both a biological fermentation and distillation process, and a thermochemical biomass gasification process to obtain syngas (H<sub>2</sub> and CO) which, through fermentation, produces ethanol and generates energy via a combined cycle or cogeneration. An initial production plant, with a capacity of 180 000 tonnes/annum will begin operating this year in Porvoo, Finland, with another planned for the end of 2008 at the same location. These processes, however, give very low and in some cases negative

energy yields. This has led to research on the development of photochemical production processes, using sunlight as an energy source and appropriate catalysts able to improve properties. Biobutanol provides one possible solution for new generation biofuels. It has low vapour pressure and also tolerance to water contamination in petrol blends, facilitating its use in existing petrol supply and distribution channels. Bioethanol can be mixed with petrol in higher concentrations than existing biofuels, without the need to modify vehicles. It also offers higher fuel savings than petrol-ethanol blends, thus improving energy efficiency and reducing consumption per litre. Biobutanol can be produced using bioethanol plants.

4.34 The 7th Framework Programme has earmarked substantial resources for the development of these technologies, which offer a range of interesting characteristics and produce 'clean' biofuels:

- they do not contain sulphur, aromatics or polycyclics;
- they are stable;
- emissions are very low;
- they have a very high cetane number (85-100);
- they exceed the low-temperature thresholds for the use of some types of biofuels;
- they can be added in very high proportions to normal diesel (up to 60 %);
- their technical characteristics have already been defined and included in the list of biofuels in Article 2(2) of Directive 2003/30/EC.

The Committee believes that Europe has to allocate more financial resources to second-generation biofuel research.

## **5. Specific comments**

5.1 The Committee endorses the objectives of the EPE: if they are to be achieved, funding will have to be found for the necessary investment, bringing in the European financial institutions.

5.2 The Committee believes that particular attention should focus on research in the biofuels sector, especially for second-generation fuels, without sacrificing other possibilities such as those produced by the development of solar hydrogen or biomass processing.

5.3 The Committee recommends that special attention be paid to respect for biodiversity and the use of exclusively non-food crops for biofuels, in order to prevent the risk of competition between food and fuel when millions of human beings still lack sufficient food and are starving to death. The conclusions of the above-mentioned FAO report point out that 'As many as 854 million people worldwide still remain undernourished,

reflecting the insufficient progress towards the World Food Summit target and the Millennium Development Goals. While many countries, especially in Sub-Saharan Africa show potential for reducing their numbers of hungry people, this figure still remains threatened by increasing food prices, potentially tighter grain markets, conflict, disease and climate change'. According to American researchers Ford Runge and Benjamin Senauer of the University of Minnesota, food cereal price changes give reason to believe that, rather than falling to 600 million in 2025 as predicted, the number of people going hungry in the world will double, reaching 1 200 million.

5.4 With a view to achieving the objectives of environmental protection, reduced greenhouse gas emissions, optimised energy consumption, the use of alternative energies, energy autonomy and security of energy supply, the Committee suggests special treatment (tax and administrative incentives, etc.) for those products which make the most substantial contribution to these objectives.

5.5 The Committee considers that at their current stage, the existing technologies demand very heavy consumption of energy, water and land (yields per hectare are such that if one third of the entire land surface of Italy were to be devoted to rapeseed cultivation, the amount of biodiesel obtained would only be enough to replace 10 % of Italy's total oil consumption, and 40 % of diesel consumption for vehicles).

5.6 The Committee believes that the proposal for a new directive should be accompanied by a major and wide-reaching process of economic, environmental and social assessment which, at least at the present stage, does not appear to be structured in a way commensurate with the importance of the issue.

5.7 If the fight against pollution is not to be in vain, it is essential to secure biofuels using 'zero-mile' domestic agricultural products. They should not be transported from distant countries, with the consequent consumption of fossil fuels. The difficulties in recuperating energy from agrifood residues arise from their widespread distribution, requiring costly transport to processing centres, and from their significant water content implying high volumes for processing. For these reasons, biomass of this kind should preferably be processed in situ.

5.8 The Committee believes support should be given to research into biofuel cell technologies, i.e. biofuel cells that use biocatalysts to convert chemical energy into electricity. This energy-producing process enables the recovery of all the elec-

trons accumulated during the photosynthesis process by the plant from which the biomass is taken (24 electrons for every molecule of glucose oxidised to CO<sub>2</sub> and water).

5.9 The Committee agrees with the views of the European Parliament which, in the recitals of its resolution on a strategy for biomass and biofuels, adopted in Strasbourg on 14 December 2006, pointed out that 'the transport sector is responsible for more than 20 % of greenhouse gas emissions although this sector is not included in the emissions trading system ...'. The Committee therefore recommends that the Commission envisage extending the application of the 'white certificates' scheme to the vehicle sector.

5.10 In the same resolution, the European Parliament 'asks the Commission to introduce a mandatory and comprehensive certification scheme allowing the sustainable production of biofuels at all stages, including standards for the cultivation and processing phases, as well as for the overall life-cycle greenhouse gas balance, applicable to biofuels both produced within, and imported into, the European Union', and 'to support the development and use of the Global Monitoring for Environment and Security (GMES) system to monitor land use in the production of bioethanol so as to prevent the destruction of rainforests and other negative impacts on the environment'. The Committee agrees with and supports the European Parliament's proposals.

5.11 The Committee points out that the vehicle fleet of some of the recent Member States is highly obsolete, being made up of the least efficient used vehicles from the rich markets. Per capita income in these countries is rather low, as is also the case for major sectors of the population in the higher per capita income countries. Consequently, it is not practicable to consider imposing obligations and costs on these European citizens, for whom the private car may be an essential work tool.

5.12 The Committee believes that, at this stage, biofuels can lend support to the fuels market, provided production is closely monitored in order to avoid the environmental and social risks set out in the present opinion, but cannot provide a structural answer to the market's demands. In view of the potential problems identified in this opinion, the Committee believes that the Commission should keep the 10 % target under continuing review, and be ready to propose modifications to it if the problems cannot be satisfactorily overcome in a sustainable way.

Brussels, 24 October 2007.

The President  
of the European Economic and Social Committee  
Dimitris DIMITRIADIS

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