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Growing food and fuel

Report¹

Committee on the Environment, Agriculture and Local and Regional Affairs

Rapporteur: Mr Nigel EVANS, United Kingdom

Summary

Agrofuels, which until only recently were regarded in some quarters as a miracle solution to the planet's energy problems, have become the subject of controversy surrounding their effects both on society and on the environment.

It seems that the over-development of agrofuels is not justified from the point of view of environmental protection and that it would actually have a negative impact on agriculture and the environment in the broadest sense.

The report calls on governments to take the necessary measures to balance food and fuel production, to phase out financial incentives over a period of time, to step up research and development investment concerning second-generation agrofuels and study the possibilities offered by alternative energy sources.

1. Reference to committee: [Doc. 11443](#) and Reference No. 3398 of 21 January 2008.



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A. Draft resolution

1. In a context of limited fossil energies and the alarming consequences of climate change, the production of agrofuels appeared to be a miracle solution.
2. However, their increasing use, while helping to cut energy dependence and fossil fuel consumption, has begun to pose problems of another kind. It is a fact that the allocation of land formerly used to produce foodstuffs to the growing of agrofuels has not only had damaging consequences for food production but also raised doubts as to whether they really help to preserve the environment.
3. Moreover, studies have shown that agrofuels quite often produce more greenhouse gas emissions than the fossil fuels they are replacing, if we take all the factors in their production chain into account.
4. Deforestation and changes in land use trigger the release of large quantities of previously stored CO₂. In addition, there are the gas emissions resulting from the production, transformation and transportation of agrofuels, as well as the deployment of technologies using oil derivatives and other greenhouse gas-emitting components.
5. Some studies suggest that the climate would be more effectively protected by conserving or restoring forests and grasslands rather than developing crops for agrofuel production. Reforestation would make it possible to capture between two and nine times more CO₂ over a period of thirty years than would be saved in terms of emissions through the use of agrofuels over that period.
6. According to the OECD, agrofuels would help to reduce CO₂ emissions by only 3% at best, at a cost of €360 euros per tonne of CO₂ saved.
7. The development of agrofuels is therefore highly controversial from the energy balance point of view. More oil is sometimes needed to manufacture agrofuel.
8. In terms of foodstuffs, it is estimated that the quantity of cereals needed to fill a lorry's tank with agrofuel could feed one person for a whole year. According to FAO estimates, 10% of the overall price increase in the food sector is down to agrofuels, while the IMF puts forward a figure of 30%. The World Bank puts this percentage at around 75%.
9. A study by Stanford University has shown that agrofuels also have harmful effects on health. The use of ethanol could well cause a considerably greater public health problem than the present pathologies linked to hydrocarbon pollution. Ethanol combustion engines escalate the amounts of ozone toxicity in the air, particularly in cities already affected by pollution.
10. The Parliamentary Assembly had been surprised that the European Commission had chosen to give its strong backing to the development of agrofuels despite the alarm bells rung by scientists, farmers and environmental activists. It was all the more surprised that the European Commission stressed that agrofuels had only a negligible influence on rising foodstuff prices and had set a target of 10% for agrofuels by the year 2020.
11. The Assembly welcomes the fact that the European Commission reconsidered its position in July 2008, emphasising that its targets did not in fact include any specific obligation as to the use of agrofuels but related to renewable energies in general.
12. The Assembly believes it desirable for Council of Europe member states and non members, as well as the European Commission and the other international organisations concerned, to commit themselves without delay to an effort to find a compromise solution between the world's fuel needs (especially in the wealthy countries) and foodstuff needs (especially in the poor countries).
13. For these reasons the Assembly invites the governments of Council of Europe member states and observer countries and all the international organisations concerned to consider agrofuels as one of the key elements in their policies for renewable energies and, while doing this:
 - 13.1. take better account, in the framing of their energy and agriculture policies, of the damaging effects on the environment, agriculture and food if the development of agrofuels is taken too far;
 - 13.2. learn from both the positive and negative aspects of existing experiences, since even a successful model cannot be identically replicated without taking into account local realities;
 - 13.3. phase out over a period of time all financial incentives granted to the producers of agrofuels and step up free trade in both agrofuels and the raw materials used to manufacture them;

- 13.4. ensure that any agrofuels imported are produced in full respect of the sustainability criteria;
- 13.5. encourage more strongly investment in research and development in the area of second and next generation agrofuels, whilst clearly classifying agrofuels generations by their performance in terms of resource use, environmental impact and greenhouse gas emissions;
- 13.6. support research into algae-based agrofuels;
- 13.7. encourage the construction of bio-refineries capable of manufacturing a whole range of products and not limited to agrofuels;
- 13.8. study in greater depth all the possibilities on offer from alternative energy sources, in order to generate electricity more cheaply;
- 13.9. emphasise the development of policies aimed at reducing energy demand and greenhouse gas emissions, *inter alia*, by encouraging the development of vehicles which are both less polluting and more energy-efficient.

B. Explanatory memorandum, by Mr Nigel Evans

1. Introduction

1. In a context where fossil energies are limited and access to them is synonymous with national security and given the alarming state of global warming, using agrofuels as substitutes for fossil fuels may appear to be a miracle solution.
2. The vast majority of specialists agree today that fossil fuel consumption is one of the main causes of global warming and climate change. Among the alternatives to fossil fuels, agriculture is undeniably of specific interest. Some plants may be used to produce fuels, to replace the “classic” oil-based fuels.
3. It would seem, however, that the large-scale production of plants to manufacture “agrofuels” (bio-organic fuel which may be used in car engines), while helping to cut energy dependence and fossil fuel consumption, poses problems of another kind. It is a fact that the allocation of land (formerly used to produce foodstuffs) to the growing of agrofuels might well have damaging consequences for food production.
4. Some maintain that the use of agrofuels contributes to or could even be the cause of a substantial rise in the price of agricultural produce grown for human and animal consumption. This is what has happened in South America where rising prices have jeopardised access to foodstuffs, while maize intended to feed people has been sold for the production of agrofuels. In addition, the fact that farmers are opting to grow maize (now more profitable) instead of wheat has prompted a spectacular increase in the price of the latter foodstuff, which has become a rare commodity.
5. In Brazil, 6 million vehicles are already running on a blend of 25% ethanol and petrol. The European Union has set the share of agrofuels within total fuel consumption at 10% by 2020. It has even considered the elimination of fallow land, entailing a potential increase in cereal production from 10 to 17 million tonnes, which should help to slow the general rise in the price of agricultural produce. According to the FAO, world cereal production in 2007 reached 2 095 billion tonnes, an increase of 4.8% compared with 2006 – which is explained at least in part by an increase in the area of farmland used for agrofuel production. Even so, we should also take into account the strong rise in food consumption in the large emerging economies such as China.
6. Furthermore, the crops grown for agrofuel production may be fertilised with substances not authorised for crops intended for food production. Yet those substances – particularly when used in large quantities – may have harmful effects on the environment. So, paradoxically, agrofuels could have adverse effects on both agriculture and the environment, as well as on water resources, and also contribute to deforestation, desertification and famine in certain regions of the world.
7. It is important, therefore, from both the environmental and agricultural viewpoints, as well as in a medium and long-term economic perspective, not to excessively develop this new sector which could endanger the traditional role of agriculture – namely feeding humankind – and also damage the world’s environment through undesirable effects and impoverish and starve certain populations.

2. Technical overview

8. There are a great many types of agrofuel – ranging from wood used to cook food to highly sophisticated modern fuels obtained from purpose-grown biomass.
9. Agricultural residues – such as animal waste products – may also be used as agrofuels. In some European countries such as Germany, France and the Netherlands, animal waste is becoming a problem for the environment. But it can be used for energy production through a fermentation process. In China, this technology has been used for over twenty years and there are now 10 million biogas digesters using animal waste.
10. The vegetable matter used for agrofuels may come from fast-growing trees, cereals, vegetable oils, agricultural residues or, in the case of Brazil, sugar cane.
11. Where sugar cane is concerned, for example, either the sugar or the bagasse may be used as a source of energy. Bagasse is the cane-waste that remains once the stems have been pressed, and it is very useful as a fuel, forage-stuff and construction material. Sugar refineries use the bagasse as an energy source to

supply the heat required for the sugar production process. Modern technology makes it possible to use bagasse far more efficiently, so that much of it can be exploited to generate electricity through a normal fuel-burning power station. In this way, a food industry becomes an energy-generating industry too.

12. Agrofuels are not a new resource. They were already known about during the early stages of the car industry: when the combustion engine came into being, its inventor, Niklaus Otto, anticipated using ethanol as a fuel. Furthermore, the first diesel engine, named after its inventor, Rudolf Diesel, ran on peanut oil. And Henry Ford had thought of using ethanol to run the famous Ford Model T, manufactured from 1903 to 1926.

13. Following the two oil crises in 1973 and 1979, there was growing interest in agrofuels. But this enthusiasm soon waned when the price of oil fell in 1986. Since the turn of the century, there has been a further upsurge of interest in agrofuels in the context of another rise in the price of oil, the unstable situation of certain major oil exporters and a determination to combat the greenhouse effect.

14. There are two main families of agrofuels: ethanols (for petrol engines) and agrodiesels (vegetable oil methyl esters (VOME)) for vehicles running on diesel. At present, agrodiesel is used far more than ethanol in Europe in a ratio of 80%:20%. That ratio could change in future, with the appearance of cars with dual-fuel engines (known as “flex-fuel”), using a maximum of 85% ethanol for 15% petrol. Ethanols are derived from sugar beet, wheat, maize or sugar cane. The technique entails extracting the sugar, directly or by starch hydrolysis in the case of wheat, and then fermenting and transforming it into ethanol. Agrodiesels are extracted and transformed from vegetable oils (rapeseed, sunflower, soya and palm) with the resulting esters blended with diesel fuels.

15. In Europe, France is the leading producer of ethanol alcohol, accounting for 33% of Europe's production.² But Spain remains the leading producer of ethanol intended for the manufacture of fuels. In the period 2005-06, France produced over 9 million hectolitres of alcohol including 7.6 of alcohol of agricultural origin, sourced from beet (81%) and cereals (19%).

16. Globally, the main producers of ethanol of agricultural origin are the United States (some 200 million hectolitres in 2006) and Brazil (some 170 million hectolitres in 2006). These two countries are “models” of industrial agriculture, highly mechanised and geared to single-crop farming, intensification and modern biotechnologies. In 2006, the world production of ethanol of agricultural origin was nearly 500 million hectolitres, with Brazil and the United States alone providing around three quarters of that volume.

3. The effects on the environment

17. The downside is that agrofuels may in some cases produce more greenhouse gas emissions than the fossil fuels they are replacing, if we take all the factors in their production chain into account. Deforestation and changes in land use trigger the release of large quantities of previously stored CO₂; in addition, there are the gas emissions resulting from the production, transformation and transportation of agrofuels, much of which is done by machinery and technologies using oil derivatives and other greenhouse gas-producing elements.

18. According to a study published in *Science* magazine, the climate would be more effectively protected by conserving or restoring forests and grasslands rather than developing crops for agrofuel production. The study shows that reforestation would make it possible to capture between two and nine times more CO₂ over a period of thirty years than would be saved in terms of emissions through the use of agrofuels over that period.

19. The OECD considers that agrofuels would help to reduce CO₂ emissions by only 3% at best, at a cost of €360 per tonne of CO₂ saved, and criticises the tax incentives offered by some states to agrofuel producers.

20. Moreover, the development of agrofuels is highly controversial even from the energy balance point of view. More oil is needed to manufacture agrofuel. In the case of maize-based ethanol, for example, 1.3 kilocalories of oil are needed to produce 1 kilocalorie of bioethanol.

21. In terms of foodstuffs, the quantity of cereals needed to fill a lorry's tank with agrofuel could feed one person for a whole year.

2. Further to a study visit to the ARD Research Centre on Agrofuels and to the CRISTANOL agrofuels factory in France, on 17 December 2008, the Committee on the Environment, Agriculture and Local and Regional Affairs was able to take note of both the positive and negative aspects of agrofuel production.

22. It would appear that the harmful effects of agrofuels on health are by no means negligible either. A study by Stanford University has shown that the use of ethanol will ultimately cause a considerably greater public health problem than the present pathologies linked to hydrocarbon pollution. Ethanol combustion engines escalate the amounts of ozone toxicity in the air, particularly in cities already affected by smog. Using ethanol instead of petrol is likely to cause 9% more air pollution-related deaths.

23. Some policy makers (including members of the United Kingdom Government) have already expressed concerns about what they consider to be the overly pro-agrofuel leanings of the European Commission, which has set at 10% the agrofuel content in fuels to be achieved by 2020, despite the manifold questions thrown up by such fuels. Germany is preparing to abandon a massive development of agrofuels, for studies have shown that 10% ethanol content in conventional petrol may cause premature wear in engines.

24. Similarly, studies conducted, but not published, by the European Commission's own scientific department, the Joint Research Centre (JRC, known in French as the *Centre commun de recherche*), have sounded alarm bells: there is too much uncertainty to be able to say whether or not the European Union's 10% agrofuel target will bring about greenhouse gas reductions, and the indirect emissions caused by the use for agrofuel production of what was previously arable land or woodlands might offset the benefits that the agrofuels bring. The same studies also say that, if the intention is to reduce greenhouse gases, it is far more effective to use biomass to generate electricity than to produce conventional agrofuels. The same conclusion was reached in a report published in May 2007 by UN-Energy.

4. The effects on agriculture

25. Beyond the ecological concerns, there are other important issues, focusing on access to land, food sovereignty and famine on a planetary scale.

26. The swift increase in demand for agrofuels will mean that thousands of hectares of fertile land will no longer produce food and will be used to produce fuels instead. This land will be concentrated in the hands of a few large agri-food multinationals and the energy sector, resulting in smallholders being "displaced" towards the misery of over-populated urban centres or converted into landless rural workers.

27. Similarly, forests will no longer guarantee the subsistence of thousands of people, the water sources of these regions will be contaminated and the soils of these already fragile ecosystems will be gradually exhausted by intensive agriculture and the massive use of chemicals (many of which are banned for food crops while tolerated for non-food crops but no less harmful to the environment). This has already happened in South America (especially in Colombia, Amazonia and Brazil), where the development of single-crop farming of soya, sugar cane or African oil palm has led to massive deforestations. These mechanised monocultures use high doses of fertiliser (such as atrazine, a very harmful herbicide with endocrine-disrupting effects).

28. Studies have revealed the risks for soil quality of large-scale exploitation of agrofuels. The findings of one such study in Switzerland show that farming geared to the production of agrofuels (unfortunately also known as "biofuels", which is likely to cause confusion with agricultural produce labelled as organic) is incompatible with sustainable organic farming, as it does not return enough nutrients back into the soil.

29. Organic farming hinges on closed cycles of food substances: the nutrients drawn from the soil are returned to it in the form of compost, organic fertiliser or manure. In contrast, in the production of plants for fuel, nearly 100% of the biomass is removed from the soil farmed. This means that the risk of ensuing soil deterioration must be reduced by external additives.

30. For these reasons, many farmers' organisations are condemning the development of agrofuels as a new form of industrial exploitation of agriculture, requiring even more arable land, machinery and chemicals with the likelihood of rapid development of "monoculture deserts" at the expense of small-holding and family agriculture. They see this trend as a real threat to their family agriculture as, in the long term, the multinationals will not only be favoured by permissive legislation and grants but will also have control over the means of production (seeds, machines, transport). Farming organisations are also critical of the emergence of a new lobby around this new energy source. The issue was raised at the World Forum for Food Sovereignty (Nyeleni, Mali, 2007), where participants from the five continents drew attention to the potential excesses and dangers of what might become a new lobby for a new kind of oil.

31. Moreover, if we consider the situation from an economic viewpoint, it is clear that the production of fuels from agricultural produce has already heavily contributed to rising food prices on the world market, with dramatic consequences for the diets of millions of people.

32. As explained at the Climate Change Talks in Bangkok in April 2008, every time that a cultivated area is allocated to agrofuels, the price of the commodity grown rises, in addition to which other farmers produce more of it, very often by expanding into forests and pastures (areas which also absorb large amounts of CO₂). Furthermore, the question has been raised of whether the quantity of agrofuels needed to meet the targets envisaged by the European Commission can be produced on European soil alone, or whether some imports would be necessary. As the Chair of the United Kingdom House of Commons Select Committee responsible for agriculture has said, if the only way of meeting these targets is to import agrofuels, Europe will be just as vulnerable as it is because of its dependence on imports of oil and gas.

33. In March 2008, the Chief Executive Officer (CEO) of Nestlé warned that meeting 20% of the rising demand for oil through agrofuels, as planned, would leave us with nothing to eat.

5. The advantages

34. The world's most powerful industries see the development of agrofuels as a source of substantial profits. The possibility of government backing through laws and grants makes the prospects even more enticing. The main players are the car manufacturers (which hope that the advent of agrofuels will force people to change cars), oil producers (which control the system of fuel distribution), the companies that control world trade in grain (which will gain greatly from both increased demand for agrofuels and higher prices of foodstuffs which will have to compete with them) and the transnationals producing GMOs.

35. The other sectors standing to make economic gains are the large forestry and cellulose transnationals (which produce for the paper industry today but could, with a minimum of technological changes, convert to ethanol processing factories) as well as the industrial manufacturers of chicken and cattle feed, which are considering the possibility of developing agrodiesel from animal fat.

6. Second-generation agrofuels

36. Following severe criticism of the development of agrofuels (including that expressed by the UN's special rapporteur on the right to food, Jean Ziegler, who spoke of a "crime against humanity", and by John Lipsky, First Deputy Managing Director of the International Monetary Fund (IMF), who said that the development of agrofuels was responsible for 70% of the rise in the price of maize and 40% of the increase in the soya price), manufacturers have been trying to perfect a second generation of agrofuels based on biomass, which would make use of the non-edible part of crops.

37. Second-generation agrofuels will thus no longer be manufactured from seeds and plants, but using non-edible organic material from plants, the natural decay of which on the ground helps to create the humus needed for regeneration, or even using wood taken from trees. Thus any plant could be used to produce second-generation agrofuels.

38. There nevertheless remain problems that will have to be taken into account when this second generation is developed: the stock of humus, which plays a major role in soil fertility and carbon storage, and the use of wood, which must not give rise to deforestation.

39. There are, however, limited amounts of agricultural residues. The priority where agrofuels are concerned is therefore productivity. At the moment, the energy output of second-generation agrofuels remains very low. It will be at least another ten years before they are produced in industrial quantities.

40. Germany has, however, decided to play a pioneering role in the development of second-generation agrofuels. A factory is to be built which will produce a BTL (biomass to liquid) fuel, with production scheduled to start at the beginning of 2009. It has been designed to produce 18 million litres of fuel per year.

41. Another avenue that could be explored in future is that of microscopic algae, capable of generating an output 30 times higher than that of terrestrial oleaginous plants. While the price of algae-based agrofuel would be high, it would still be below the price of oil.

7. Conclusions

42. The agrofuels "boom" may seem easily justifiable on the basis of some theories and above all its presentation as a miracle solution to the world's energy problems. However, the more we go into this subject in detail, the clearer it is that the over-development of agrofuels is causing problems for society.

43. It was somewhat surprising to note that the European Commission had chosen to give its strong backing to the development of agrofuels despite the alarm bells rung by scientists, farmers and environmental activists. The President of the European Commission had acknowledged the potential environmental problems of agrofuel production but had stated his assurance that they could be avoided, adding that more research would improve production. The European Commissioner for Trade is confident that consumers will pay for agrofuels only if they have a guarantee that agrofuel production will not pollute the environment, and the European Commissioner for Energy, for his part, has affirmed that the development of agrofuels entails significant reductions in greenhouse gas emissions, as compared to their alternative, namely oil. Then, in July 2008, the European Commission reconsidered its position, emphasising that, in fact, its targets did not include any specific objectives as to the use of agrofuels, but related to renewable energies.

44. Policy makers in Europe, as in other parts of the world, must base their action on full and reliable information covering every area that might be affected by the future development of the agrofuels industry. That is why this report calls for a moratorium on the development of first-generation agrofuels, in parallel with efforts to increase energy efficiency and to promote vehicles which emit less CO₂.

45. It would therefore be desirable for Council of Europe member states and non-member states, as well as the European Commission and the other international organisations concerned, to start without further delay the search for a solution which balances the planet's fuel needs (especially those of the rich countries) and its food needs (especially those of the poor countries). In this context, they should, *inter alia*:

- take better account of the damaging effects on agriculture and food if the development of agrofuels is taken too far;
- progressively eliminate all subsidies granted to the producers of agrofuels;
- encourage the development of second-generation agrofuels;
- support research into algae-based agrofuels;
- emphasise the development of vehicles which are both less polluting and more energy-efficient.

Reporting committee: Committee on the Environment, Agriculture and Local and Regional Affairs.

Reference to committee: [Doc. 11443](#) and Reference No. 3398 of 21 January 2008.

Draft resolution adopted unanimously by the committee on 18 December 2008.

Members of the committee: Mr Alan **Meale** (Chair), Mrs Maria Manuela de Melo (1st Vice-Chairperson), Mr Juha **Korkeaoja** (2nd Vice-Chairperson), Mr Cezar Florin Preda (3rd Vice-Chairperson), Mr Ruhi **Açikgöz**, Mr Miloš Aligrudić, Mr Alejandro Alonso Núñez, Mr Gerolf Annemans, Mr Miguel Arias Cañete, Mr Alexander Babakov, Mr Rony Bargetze, Mr Fabio Berardi, Mrs Guðfinna S. Bjarnadóttir, Mr Ioannis Bougas, Mr Ivan Brajović, Mrs Elvira Cortajarena Iturrioz, Mr Valeriu Cosarciuc, Mr Taulant Dedja, Mr Hubert **Deittert**, Mr Miljenko Dorić, Mr Gianpaolo Dozzo, Mr Tomasz **Dudziński**, Mr József Ékes, Mr Savo Erić, Mr Bill **Etherington**, Mr Nigel **Evans**, Mr Joseph Falzon (alternate: Mr Joseph **Debono Grech**), Mr Gianni **Farina**, Mr Iván Farkas, Mr György Frunda, Ms Eva Garcia Pastor, Mr Zahari Georgiev, Mr Peter Götz, Mr Rafael Huseynov, Mr Jean Huss, Mr Fazail İbrahimli, Mr Ilie Ilaşcu, Mr Ivan **Ivanov**, Mr Igor Ivanovski, Mr Bjørn Jacobsen, Mr Gediminas Jakavonis, Mrs Danuta Jazłowiecka, Mr Stanisław Kalemba, Mr Ishkhan Khachatryan, Mr Haluk Koç, Mr Gerhard Kurzmann, Mr Dominique Le Mèner, Mr François Loncle, Mr Aleksei Lotman, Mrs Kerstin Lundgren (alternate: Mr Kent **Olsson**), Mr Theo Maissen, Mr Yevhen Marmazov, Mr Bernard Marquet, Mr Mikheil Matchavariani, Mr José Mendes Bota, Mr Pasquale Nessa (alternate: Mr Marco **Zacchera**), Mr Tomislav Nikolić, Mrs Carina **Ohlsson**, Mr Joe O'Reilly, Mr Germinal Peiro (alternate: Mr Jean-François **Le Grand**), Mr Ivan Popescu, Mr Jakob **Presečnik**, Mr René Rouquet, Mrs Anta Rugăte, Mr Giacinto Russo, Mr Fidas Sarikas, Mr Herman Scheer, Mr Andreas Schieder, Mr Hans Kristian Skibby (alternate: Mr Morten **Messerschmidt**), Mr Ladislav Skopal, Mr Rainder Steenblock, Mr Valeriy Sudarenkov, Mr Vilmos Szabo, Mr Vyacheslav Timchenko, Mr Bruno Tobback, Mr Nikolay Tulaev, Mr Tomas Úlehla, Mr Mustafa **Ünal**, Mr Henk van Gerven, Mr Rudolf **Vis**, Mr Harm Evert Waalkens, Mr Hansjörg Walter, Mrs Rodoula Zissi.

NB: The names of those members present at the meeting are printed in **bold**.

Secretariat to the committee: Mrs Nollinger, Mr Torcătoriu and Mrs Karanjac.