EEB position on Biomass and Biofuels: the need for well defined sustainability criteria

December 2005

Summary and 7 key points

The promotion of bio-energy and biofuels should be an integrated part of a coherent approach to combat climate change and its merits must be compared to that of other policy measures. The use of biofuels must have clear climate benefits without jeopardising countries abilities to achieve other environmental priorities such as halting the loss of biodiversity, preventing soil degradation and achieving good ecological status of its water bodies.
-> The objective of a policy for bioenergy is first and foremost to combat climate change.

The potential of biomass as an energy source should be developed as part of a strategy to fight climate change. Nevertheless it should be stressed that this potential has its limitations and several drawbacks do exist. More alternative energy sources need to be developed with a first and foremost priority given to energy efficiency and the development and application of clean technology. Most importantly, not all bio-energy is good for the environment on all accounts.
-> Bioenergy is important but not the silver bullet it is often made out to be.

The experience with first and second generation biofuels shows the importance of innovation. This means that a policy for bio-energy should do more then simply provide a new outlet to continue unsustainable production patters within the agricultural sector. It also means that the production of crops for energy should be driven by market forces, not subsidies. It should provide the right incentives so that those forms of bio-energy which provide the highest environmental and climate benefits receive the highest support.
-> Bio-energy policy should drive technological development and innovation and incentives should therefore be based on real environmental benefits.

It is very likely that a large part of the biomass consumed in the EU will be imported because it will simply be cheaper to produce in third countries. This also entails a risk of even greater pressures on pristine and natural ecosystems in particularly tropical countries. It is absolutely crucial that by developing a

European bio-energy market, we do not incentivise the clearance of pristine habitats in both developed and developing countries.
-> Setting up a system which will realistically ensure that the crops produced meet key sustainability criteria should be a condition *sine qua non* for the promotion of bio-energy and specifically biofuels.

Also when the production of biomass is done in a sustainable way, it is important that it is used in those sectors where it is most efficient. This means for example where the limit of the energy efficiency potential is reached or where biomass can be directly transformed into energy as for example is the case in the heating and cooling sector.
-> Biomass should be used in those sectors where it achieves the highest environmental and climate benefits.

Given the conflicting demands on waste biomass, the necessity of a hierarchy of use options (similar to that of waste) should be considered which will ensure a maximum resource and therefore energy efficiency. For example, first use biomass for food and feed, then for material uses such as building and products and then for use of bioenergy and second generation biofuel.
-> It is absolutely imperative that bio-energy will not be used as an excuse to promote incineration over more resource saving options such as recycling, reuse, food and feed applications or to allow combustion installations to reduce their level of environmental ambition below that required by the Waste Incineration Directive,

In the annex to this position paper we have drafted an example of the kind of sustainability criteria which should ensure that bio-energy is produced and used in the most efficient and environmentally beneficial way.
-> These criteria should be written down in the legal text of any legislative proposal which promotes bio-energy and biofuels or be mentioned together with the measures proposed in a Communication.

Introduction

The last few years have seen a growing increase in the attention for energy and fuels from biomass including biofuels. This is predominantly fuelled by, on the demand side, an increasing understanding that with rising oil prices coupled to a surge in energy demand[1], alternative energy sources are a bare necessity and, on the supply side, an agricultural sector that seeks to diversify its production and find a new outlet for its food surpluses. And of course there is a growing understanding that in order to fend off the worst effects of climate change, CO2 emissions must be curbed.

Given the low efficiency and potential of first generation biofuels and the lack of adequate safeguards to ensure that biofuels would be produced in a sustainable way, the European Environmental Bureau was highly sceptical of the Biofuels Directive (2003) and rejected the setting of binding targets. As a result of the development of 'second generation biofuels' some of the concerns we had then as regards efficiency and real climate benefits are now less strong, though still valid for some type of biofuels. However, other concerns such as the limited potential of bio-energy in tackling climate change, the impacts on other environmental priorities, the risk of diverging attention from the need to focus on energy efficiency, the trade-offs between food and energy crops (and consequently the competition for land) and the risk of exporting environmental problems by importing unsustainably produced biofuels from other countries, remain. Therefore the need for adequate safeguards remains as crucial as it was in 2003.

This is not to say that the EEB is simply against bio-energy. The EEB thinks it is important that alternative energy sources, including fuels for the transportsector, are being developed. However, that should be done with care, because certain biofuels are certainly not as green as they are often portrayed to be. The production and use of bio-energy must be carefully assessed on its environmental impacts, including that on biodiversity, and support must be given only to ones that have a good score on all accounts. Most importantly it should be made very clear that the primary objective of the promotion of biofuels should be to make a significant contribution to combating climate change, without negatively affecting other environmental objectives and not just to offer compensation to farmers affected by price cuts within certain Common Market Organisations.

Why sustainability criteria?

Biomass and biofuels should be assessed on two key criteria. Firstly, the net climate benefit of the biofuel must be clear. Secondly, the so called 'other' environmental impacts of the production, including the impact on biodiversity must be assessed and be part of the certification system. For this to work,

[1] In its 2005 World Energy Outlook, the International Energy Agency assesses that world energy demand is projected to increase by over 50% between 2005 and 2030

precise criteria need to be developed based on scientific evidence which will be regarded as non-discriminatory and internationally acceptable[2].

A variable carbon balance

For the production of biofuels, plants are used which have captured CO_2 during their growth. Theoretically that means they should be CO_2-neutral when used. Regretfully that is never true for 100% in practice, but in some cases not true at all. A lot of biofuels used in the world now are not environmental friendly because plants are used that are grown with too much pesticides and fertilizers, which give rise to water and air pollution, not to mention the clearing of pristine habitats in tropical countries to give way to palm oil plantations. In addition, often there is a lot of energy required to grow the plants and to produce the biofuels from the crop. For example, biodiesel made out of oilseeds in Germany and France is only 50% better in CO_2-emission than normal diesel[3]. Moreover CO2 is also emitted out of the soil, sometimes in big amounts. And the use of fertilizer gives rise to a high emission of N2O, a very strong climate gas. The climate effect of biodiesel from rapeseed is all together nearly the same as that of diesel[4]. And some studies even showed there is no climatic gain at all. Another problem is simply the lack of agricultural land. Oilseeds, but also sugarbeets and wheat, have such a low productivity per hectare (the yield per ha is 1/5 of that of wood plantations) that there will never be enough space to produce enough for Europe's cars. Hardly the right approach when considering a reduction of CO_2-emission of 15 - 30% by 2020[5] is our goal. The set-aside lands, often pointed out as having great potential for bio-energy, even though they were originally introduced as a production control measure, also often have an environmental function, especially for biodiversity. This function must be preserved. So rather then loosing the environmental function of for example set asides for the marginal benefits of the production of sugar beet, oil seed and wheat for energy production, it makes much more sense to support the development of more efficient second generation biofuels on existing agricultural land.

> Two cars running on oilseeds would need on average 1 hectare per year. For example, to fuel all Dutch cars would require a surface 2.5 times bigger than the total agricultural area of the Netherlands (CE, 2005).

Emissions of pollutants

Another environmental impact which needs to be considered is the 'conventional pollution' such as the emission's of particulate matters which can also come from biofuels and the impacts this can have on public health and the environment.

Conflicting uses for waste

Fortunately there are better alternatives for the production of biofuels. Ethanol from waste streams from the food industry would be better, although here again

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[2] Recommendation from a feasibility study on certification for a renewable transport fuel obligation, prepared by E4Tech, ECCM and Imperial College London, June 2005

[3] CE, june 2005, In Dutch: "Op (de) weg met pure plantaaardige olie? De technische, milieuhygiënische en kostengerelateerde aspecten van plantenolie als voertuigbrandstof". CE in Delft, door H. Croezen en B. Kampman, GAVE-rapport in opdracht van Senter Novem

[4] CE, june 2005, In Dutch: "Op (de) weg met pure plantaaardige olie? De technische, milieuhygiënische en kostengerelateerde aspecten van plantenolie als voertuigbrandstof". CE in Delft, door H. Croezen en B. Kampman, GAVE-rapport in opdracht van Senter Novem

[5] As agreed by the EU heads of state during the 2005 spring summit.

we have to be careful. These waste streams should not be usable for animal fodder. Otherwise, using these for biofuels would mean that extra animal fodder has to be grown. This could be for example even more soy from Brazil, giving rise to even more pollution, a higher emission of climate gases and it means extra hectares of agricultural land at the cost of cutting more rainforest. This is not very helpful for the global environment. In addition to this, a precautionary approach to the question of when waste can be considered a fuel is necessary to avoid two possible problems:

a) the burning of waste that should be better reused or recycled – especially as concerns energy savings
b) The burning of waste without adequate controls of emissions – fuel from waste (often called Solid Recovered Fuel or Refuse derived fuel) if it has lost its waste status can be burnt in installations without applying the requirements of the Waste Incineration Directive. Thus if the installation is to avoid these requirements, then strict requirements should be applied to the pollutant or potentially pollutant forming content of the Solid Recovered Fuel, to ensure at least an equivalent level of environmental protection. The risk is that a CEN standard for SRF has been developed but is inadequate concerning environmental protection.

Secondly it is clear that there are conflicting demands on waste biomass and the necessity of a hierarchy of options (similar to that of waste in general) should be considered to ensure a most efficient resource use. For example, first use biomass for food and feed, then for material uses such as building and products and then for the use of energy, including fuel.

Imports of biofuels, exports of environmental problems?
The conversion of valuable natural and even pristine habitats in countries outside the EU is currently being driven by a strong demand for products such as palm oil and soy for the food and feed industry. When developing a bio-energy market in the EU, the pressure on these natural habitats will only increase. This can happen both directly by transforming these natural habitats into energy plantations as well as indirectly by using existing agricultural land and in this way 'force' the other agricultural production into these natural habitats. For this reason, extreme care needs to be taken when looking at imports and at the very least, biofuels from third counties must meet the same sustainability criteria as in the EU. Only the imports of biofuels that have proven to meet these criteria should be given a preferential treatment.

Policy for bio energy and biofuels should encourage sustainabilty and innovation

Biofuels made of willows and Fischer-Tropsch-diesel from woody crops, the so-called second generation biofuels, could play a crucial role to generate the required reduction of CO_2-emission per car. As the EEA briefing on 'How much Biomass can Europe use without harming the environment?'[6] concluded, the EU can meet ambitious renewable energy targets, also after taking environmental

[6] EEA, 2005, briefing paper on 'How much biomass can Europe use without harming the environment?'

constraints into account. However, it also states that this requires detailed environmental guidelines to become an integral part of all planning processes related to bio-energy.

Using these sustainable biofuels not only benefits the environment, but also is an opportunity for European companies to innovate. The Fischer-Tropsch-proces from Shell and the new bio ethanol process from woody biomass of Nedalco are examples of European companies that would stand to gain from their innovations. In order to accelerate such development, Europe should put forward conditions to the biofuels it produces and imports. These conditions should keep bad alternatives out and push for innovations. Biomass that is used should be certified to ensure that the production of the biomass did not create more problems than it solved. Such conditions will clarify the challenge for industry and push for innovations. Such an approach will be more effective than asking European tax payers to subsidise oilseed and sugar production of limited environmental benefits. Business can be stimulated and supported by reducing taxes for biofuels which are mentioned on the positive list.

The production and own use of biofuels by farmers can be seen as a way to make the agricultural sector less dependent on increasing energy prices and therefore give it a competitive advantage. The consumption of biofuels that are produced on the same farm also means less transport costs, which in turn means less energy use and therefore a higher CO2 balance. An extra advantage here is that the waste product which comes from the pressing of rapeseeds is a high quality foodstuff which means less fodder needs to be imported with all the environmental benefits following from that. The engines of most tractors can, after a modest initial investment, also run on the bio-fuel from rapeseeds (Diester), something that more and more farmers, especially in France are doing.

Tax incentives are effective to stimulate innovation and development of sustainable biofuels. Only basing the tax reduction on the real net reduction in CO_2-emission and overall positive environmental impacts will be effective to stimulate development of the right technologies and processes. The reduction must be ‘cleaned’ which means that other emissions in the production and supply chain have to be subtracted from the net gain for CO2. Also the air and water pollution have to be included in the calculation. Furthermore we need research how such a tax reduction can be implemented as to ensure that it provides the right incentives to producers in the EU. Such research should start as soon as possible so that its results can be taken up in the design of tax measures.

But also when the production of biomass is done in a sustainable way, it is important that it is used in the sectors where it is most efficient and will achieve the greatest carbon savings. This means for example where the limit of the energy efficiency potential is reached or where biomass can be directly transformed into energy as for example is the case in the heating and cooling sector.

Annex I Sustainability Criteria.

The two main conditions from which more specific conditions are derived are the following:

1. The biofuels need to have a net CO_2 emission reduction throughout the total supply chain (after reduction of emission in the production chain of CO_2 equivalents). In the short term the net gain in CO_2 emission should be at least 50% in order to qualify for tax measures. In due course the perspective has to be that it can be developed into 80% net gain of CO2 compared to fossil fuel.
2. The biofuels should furthermore fulfil a set of criteria concerning the origin, the production chain and social aspects. It is important that the production of biomass not only not exacerbates the negative environmental impact of many current farming practices but in fact constitutes an improvement to the current situation and helps meet other environmental objectives, apart from climate change.

The origin of the biomass should be known and garanteed via a certificate or label. The 'garanty of origin' ensures whether the following, more specific, criteria are met[7].

1. The CO_2 benefit should be at least 50% for the biofuel involved, with a perspective of development towards 80%, for the complete production and supply chain (seed to tank).
2. The production should be in conformity with all the legal requirements of the country concerned, including all the international treaties to which the country is a party.
3. Biomass should be grown with minimum fertilizers and pesticides input as such inputs have a serious impact on the climatic effect as well as on the wider environment.
4. The impact on the environment, apart from CO_2 emission, should also be known. Full Life Cycle Assessments must be carried out to determine whether such an impact is small compared to the benefits. Within the EU, SEA and/or EIA need to be carried out for bio-energy plans or programmes and projects.
5. No natural ecosystems should be converted as a result of the production of biomass, both directly and indirectly, as the immediate release of carbon into the atmosphere that this causes will likely outweigh any potential carbon savings.
6. Forest and agricultural ecosystems from which waste is used should not be depleted from their nutrients.
7. The use of bio-energy should not contribute to exceeding existing air quality limit values (particularly on PM10).
8. The production should not contribute to soil degradation and contamination or lead to a decline of the organic matter content of soils.
9. The biomass production should not have negative effects on the water reservoirs, especially in water scarce regions and respect existing legislation

[7] These criteria are partly following a study from the Oekoinstitut, February 2005: "Criteria for assessing environmental, social and economic aspects of biofuels in developing countries".

10. The biomass used should not be food or fodder or reduce the production of food or animal fodder.

Annex II

In order to start now with the promotion of fuels, it is conceivable to work with a temporary positive list of fuels of which is currently known that they will likely meet the above mentioned sustainability criteria. As an example one can find below a proposed temporary positive list, developed by Stichting Natuur en Milieu (2005) from the Netherlands.

+ ethanol from waste products of the agri-industry, not being valuable fodder
+ biodiesel from polluted frituurvet, not usefull for fodder
+ Fischer-Tropsch-diesel from woody biomass of sustainable origin
+ HTU-oil from ‘wet’ biomass (e.g domestic biowaste)
+ ethanol produced by a new kind of fermentation of woody biomass of sustainable origin, like straw, woodrests (snippers) and sustainable produced wood.