



Global Market for Bioenergy between Climate Protection and Development Policy

NGO Policy Paper

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IMPRINT

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Responsible Biomass Expansion – seizing opportunities, minimizing risks and side effects

BACKGROUND

This paper is the result of intensive preparation and of discussions between NGO representatives from the environment and development sectors. An earlier version was discussed in working groups at the conference “Weltmarkt für Bioenergie zwischen Klimaschutz und Entwicklungspolitik” (“global market for bioenergy: between climate protection and development”). The results of those discussions have been incorporated into this paper.

The paper aims at raising awareness among German NGOs of how important the many aspects of world trade in bioenergy are. It simultaneously aims to form an initial position on the topic of bioenergy from the viewpoint of environmental and developmental NGOs. In this phase, the discussion has an intentional German/European bias, so as to better understand and analyze our role as a bioenergy importer. The authors have concentrated on the most important lines of argument. However, some important questions remain unanswered for the time being as there has been little practical experience to learn from and the dialogue on sustainable bioenergy trade is still in its infancy.

In the next phase, the dialogue is to be “internationalized” – i.e. the perspective of potential export countries, in this case mostly Southern countries, shall be incorporated into the discussion. Only then will we be able to formulate a concept for sustainable bioenergy trade which can be carried by Northern and Southern NGOs alike.

INTRODUCTION

The increased use of biomass provides a wide range of opportunities from a climate, regional and development perspective. However, if this increase is to be designated an “environmentally and politically sustainable develop-


ment”, then the conflicting and sometimes contradictory interests concerning method and approach must be reconciled. This necessitates intensive dialogue, negotiations and a participatory process which includes all relevant players at national and international level. Only then can a corresponding political framework be put in place.

⇒ The fundamental problem is not oil, coal or gas, but the speed at which these resources are being depleted and the amounts involved. When the discussion of bioenergy revolves primarily around high oil prices and the scarcity of the resource oil, there’s a danger of reducing bioenergy to a buffer for increased energy consumption in order to stabilize oil prices or to prevent bottlenecks. But this cannot be the role of bioenergy. **If bioenergy is perceived solely as an additional energy source for increasing energy needs, this will create new, sometimes grave, problems without addressing the crucial problem of climate change.**

Currently, particularly in the transport sector, energy consumption is still increasing steadily.

⇒ Climate change caused by the use of fossil fuels and the limited supply and increased scarcity of fossil energy sources are going to result in humanity being forced to make due mostly without fossil fuels and to convert to renewable energy sources by mid-century. **Thus there is no alternative to a massive expansion of biomass utilization.** Without it, neither the current nor the future expanding energy consumption of humanity can be met, even if all potential for increased efficiency is taken into consideration. Two billion people are still waiting for initial access to modern energy services. With today’s fossil energy system, that day will never come.

⇒ Although, from a sustainability point of view, regional economic cycles are preferable, there is a fast growing world market for biomass as energy source,



since the centres of cultivation and consumption are geographically separate and the raw materials can easily be stored and transported. Some regions are much better suited for the cultivation of bioenergy crops than others. **For developing countries, the export of bioenergy sources or raw materials is a business opportunity that will be seized.** Increasing demand will ensure a steady supply. Since there are regional differences in production costs, bioenergy sources are already being traded internationally. As long as the raw materials for bioenergy are cheaper in some countries than in others, they will be bought there. **If the EU is to fulfil its political objectives, it will already be a net-importer of bioenergy for electricity, heating and fuel by 2020.**

⇒ The risks and side effects of this foreseeable development are of great importance for the ecosystems in the areas of production. **Bioenergy production is in competition with food production and with crops grown for material uses.** Although worldwide, enough food is produced to feed everyone, over 800 million people go hungry because they do not have the purchasing power to buy food. Meanwhile, the rich segment of humanity has the purchasing power to cultivate sizeable amounts of animal feed and to buy it, “processed”, as meat products. This situation is transferable to bioenergy crops. Therefore, when the cultivation of bioenergy crops is increased, it will not be sufficient to simply demand that bioenergy crops must not displace food crops. If

the cultivation of bioenergy crops is more lucrative for farmers than the cultivation of food crops, which can't be ruled out given the continuing substantial increase in fossil fuel prices, they will cultivate them anyway.


⇒ In many regions, the global consumption of wood has already exceeded a sustainable level. Particularly in densely-wooded countries, a large proportion of today's forestry can only be described as over-exploitation. Increased consumption of paper, among other factors, is also putting forests under enormous pressure. Increasingly, wood comes not from natural forests, but from industrial wood plantations, planted with only a few, usually foreign, fast-growing tree species. The ecological and social consequences of these plantations are usually devastating. One example is the sinking groundwater levels due to the eucalyptus' great need for water. **If the growing demand for bioenergy increases the consumption of wood even further, without political counteraction the same mechanisms which make the over-exploitation of natural forests and wood monoculture lucrative today will continue to operate.** Smallholder farms will be pushed aside by plantation monocultures.

In this volatile area of contradictory claims and interests, criteria and regulatory instruments for the global expansion of bioenergy allowing for an ecologically and socially sustainable large-scale use of bioenergy must be found.

Climate and Energy Policies

1. The sustainable use of biomass first of all presupposes a neutral greenhouse gas emissions balance. This does not apply to bioenergy sources generated by massive input of fossil fuel sources (fertilizers, processing, etc.). The sustainability of an energy source can, in the end, only be determined by a life-cycle assessment of the entire production and utilization chain of each energy source.
2. Once climate protection, and this means the substitution of fossil fuels, is recognized as a key driver for the utilization of bioenergy, priority must be given to those forms of biomass which reduce the highest amount of CO₂ emissions and are most energy efficient. Due to the insufficient climate protection policies of the OECD governments, CO₂ emission prices remain too low, so that economic incentives to avoid maximum CO₂ emissions with biomass from local sources are inadequate. Processed into liquid fuels, bioenergy as indicated in life-cycle assessments is 5 – 10 times less energy efficient than biogas, wood or woody biomass. The preconditions for the optimal climate-friendly use of biomass are calculable and gradually increasing CO₂ emission prices by ambitious emissions reduction targets (= shrinking emissions budgets). Without such a market mechanism, only elaborate regulatory measures can guarantee that the utilization of biomass will result in the highest greenhouse gas reduction possible.
3. In the medium term, this means that, at least in the industrial countries, the use of biomass should be concentrated in the electricity and heating market, where it can substitute for coal, which is especially greenhouse gas intensive.
4. Unprocessed biomass from the forestry and agricultural sectors is most suitable for the cogeneration of electricity and heat. Compared to the discontinuously available renewable energy sources such as wind and sun, biomass is available at all times, so that its use as a standard energy source, particularly in combination with wind and sun, should be backed politically.
5. In contrast, the transport sector is especially dependent on oil, usually imported. Therefore, the petroleum and automobile industries put particular emphasis on using biomass from biofuel crop cultivation for the production of liquid fuels. However, due to processing and refining, these biomass sources reduce significantly less CO₂ emissions. In the long term (until 2025), the greatest potential for the production of biofuels lies in wood and woody biomass. Additional subsidies for biofuels going beyond existing government subsidies would not make sense currently. Rather, the emphasis should lie on biomass use in the electricity and heating sectors. Further research is necessary to determine whether, in achieving a reduction of CO₂ emissions in the transport sector, emissions certificates in the framework of the EU emissions trading system, for example, could be a more sensible option in terms of climate protection.
6. The EU biofuels directive demands that 5.75% of European fuel come from biomass by 2010. Of all liquid biofuels¹, only biodiesel currently plays a prominent role on the German market. Biodiesel is now available nation-wide at about 1,900 gas stations. With sales at approximately 1.5 million tons, biodiesel currently covers more than 4% of the demand for diesel. The planned increase to 2 million tons would allow biodiesel to cover approximately 6% of the current demand. However, the land available for biodiesel production cannot be extended to 2 million hectares. On the contrary, the currently available land is already largely used up and half of the current biodiesel production is already based on foreign raw materials (mostly from France). Biodiesel is not yet explicitly traded on the world market. There is, however, already a global market for oils and fats characterized by high growth rates and substantial demand pressure. The demand for biodiesel on the world market will most likely further increase the

¹ In a study by the Öko-Institut Darmstadt "Kriterien zur Bewertung des Pflanzenanbaus zur Gewinnung von Biokraftstoffen in Entwicklungsländern unter ökologischen, sozialen und wirtschaftlichen Gesichtspunkten" (criteria for the assessment of biofuel crop cultivation in developing countries from an ecological, social and economic viewpoint) the most important bioenergy crops and their cultivation are catalogued and evaluated.



pressure on these markets and, for example, support the establishment of further palm oil plantations with all their negative ecological effects. The global expansion of biodiesel therefore should be subject to critical analysis. Particular attention should be paid to the fact that biodiesel has a comparably low yield per acre and therefore should only be discussed as an interim solution until the next generation of fuels is readily available.

7. Neither is it likely to be politically assertible nor does it make sense to use protectionist measures to shield expensive European bioethanol from competition from developing countries. The current tariff of 19.20 Euro/hl for unspoiled bioethanol is insufficient to compensate producers in Germany or the EU for the much lower production costs in Brazil. If it makes more sense from an ecological and an economic angle to utilize biomass in Europe primarily for the electricity and heating market, then the demand for liquid fuel should be filled mainly by imports or the regulations changed accordingly (mandatory use of biomass without specifying use as a fuel).
8. There is no need to put the emphasis on biofuel to avoid emissions in the transport sector. More important is the removal of the many counterproductive

subsidies for aviation and road transport. The indefensible growth rates of these sectors must be stopped and a goal set for raising the share of public transport as well as railways at the expense of motorised private and goods transport. Strict fuel efficiency criteria, up to and including a ban on gas guzzlers as increasingly implemented outside of Europe (against the resistance of German automobile companies), must also be put on the political agenda of the EU. We reject attempts to simply convert today's unsustainable, energy wasting transportation system to alternative fuels. It is not possible to produce such an enormous amount of fuel in a sustainable manner, particularly not when the automobile "population" keeps growing at such a fast rate.

9. Biomass can also be utilized as an energy-saving material. Substituting energy-intensively produced materials such as cement, steel, aluminium or plastic with wood in one-storey buildings, electricity poles, etc. could save substantial amounts of CO₂ emissions (globally up to 1.5%). Under world market conditions, regulatory measures via raising CO₂ emission prices and decreasing CO₂ emission budgets are only possible at EU level via cross-border levies in compliance with WTO rules. Otherwise, regulatory measures by individual governments are necessary.


Recommendations:

1. Evaluation of bioenergy sources on the basis of independent life-cycle assessments, in order to pinpoint support for efficient and sustainable biomass production.
2. In the medium term, at least in the industrialized countries, the use of biomass should be concentrated in the electricity and heating market, where the best energy balance and the highest CO₂ reduction has been proven and where especially greenhouse gas intensive coal can be substituted. Political support should therefore be concentrated on the decentralized use of biomass in CHP (combined heat and power).
3. The use of a renewable mix of sun, wind and biomass should be encouraged in order to mutually support the respective strengths of bioenergy sources.



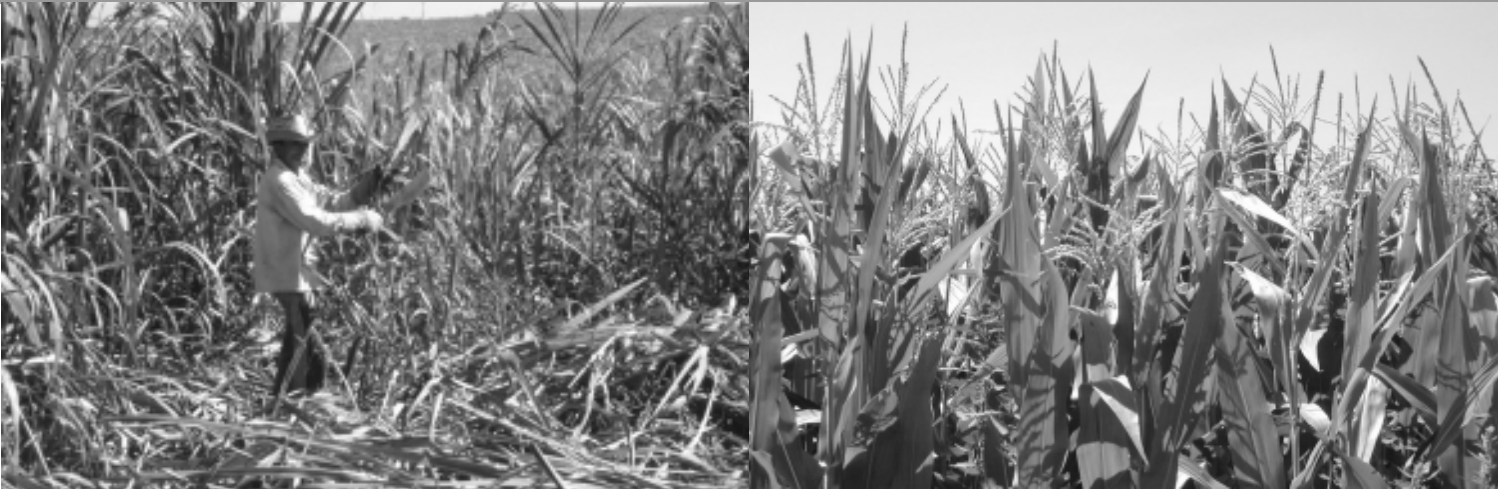
Wood Husbandry and Forestry

1. Wood is by far the most important bioenergy source. In Europe, wood is used primarily as a raw material. The percentage of wood felled for fuel within the EU is slightly more than 10%, whereas in the developing countries it averages around 80%. Wood fuel is used almost exclusively locally, often outside of the money economy, and is traded internationally at a small and decreasing rate.
2. So far, world trade in wood as a bioenergy source has been restricted due to wood's relatively low energy density. Wood pellets have the best energy density. Pellets are a by-product of the wood-processing industry, can be manufactured on premise and are thus an interesting source of supplemental income. With increasing demand and rising energy prices it is a safe assumption that raw wood or wood chips will also become an interesting export option, over and above the processing of waste products. It must not, however, be forgotten that products are already being imported which have been produced with wood energy, i.e. pig iron from Brazil.
3. In Germany too, wood is primarily used for energy outside typical market structures (private acquisition for small stoves) so that to date only limited markets have developed and it is partly unclear whether the demand is met.
4. Forests are not only suppliers of competing raw materials for competing purposes. Forests are ecosystems supporting the lives not only of many animals and plants, but also of people.
5. International use of energy competes with local use: There is reason to believe that in rural areas of the South, forests with public access will increasingly become commercialized and that the surplus wood from these forests will thus no longer be available to meet traditional needs for wood. More poverty would be the consequence, which would hit women hardest, as women have less access to money and are traditionally responsible for the care of the family.
6. In many European countries, including Germany, a great deal of forest growth is left unused because it is too expensive to harvest it. These reserves could be used for energy, although they are not large enough to cover a significant proportion of a primary energy mix. Nevertheless, an increased demand for firewood in rural areas of Germany could provide extra income.
7. Global wood consumption for paper, firewood and other uses is already too high and is only made possible to such an extent by overexploitation in most forest-rich countries. Worldwide, forests are receding at an unabated rate. Additional demand from bioenergy could lead to increased efficiency in the use of the natural resource wood, e.g. the appreciation in value of recycled paper. On the other hand, rising wood prices could also create a rising incentive to clear-cut forests. The growing need for land for the cultivation of bioenergy crops plays a very considerable role in the destruction of woods and forests as well and must be controlled accordingly.

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8. The conversion of natural forests into wood plantations with fast growing, usually foreign tree varieties such as eucalyptus is a problem well-known from the production of cellulose. The cultivation of renewable raw materials must not lead to the degradation of woods and wooded areas. Such plantations have nothing in common with the original role of the forest ecosystem and cause enormous ecological damage through, for example, sinking groundwater levels and a drastic reduction of biodiversity.
 9. Rapidly rising paper consumption already accounts for a fifth of global wood production. Germany, with a per capita consumption of 225 kilos is, with the USA and Japan, one of the world leaders in paper consumption, whereas China has a per capita consumption of only 20 kilos. Today's world average of 55 kilos per person and year is hardly reconcilable with a sustainable consumption level. Wood plantations in Southeast Asia already compete directly with food-growers for water and land. The increased use of wood as a bioenergy source also competes with the use of wood for material goods such as paper.

Recommendations:

1. Human claims to the utilization of wood must in no way ignore or compromise the preservation of the forest as ecosystem, particularly not the last remaining virgin forests.
2. The conversion of degraded land into wood plantations must be thoroughly evaluated from an ecological viewpoint. It must be taken into account how and when the land became degraded. The creation of incentives to degrade areas for the lucrative cultivation of bioenergy must be prevented.
3. Bioenergy must not increase logging in valuable, conservation-worthy forests.
4. The increased use of bioenergy from wood should be concentrated on wood waste-products from other applications to avoid an increase in exploitation pressure.
5. The conversion of natural forests into wood plantations with fast-growing, usually foreign tree varieties such as eucalyptus must be strictly prohibited.
6. The use of biomass must not reduce the percentage of dead wood in the forests.
7. Measures must be taken to substantially reduce the consumption of paper in the industrialized countries and increase the application of cascading utilization systems (i.e. use as an energy source after multiple paper recycling).



Agriculture

1. Bioenergy can create jobs and protect incomes and livelihoods if it is decentralized and processed regionally, so that the added value stays put. The opposing model is export, which requires large areas and a significantly higher level of technology. Large production units can also create jobs, but as a rule, they simultaneously displace established structures and may thus threaten small private businesses. The greater commercial interest becomes, the greater the pressure from large-scale industry will be – akin to soy cultivation in Brazil. This is particularly so in the case of bioenergy, since production is linked to the land and there is no “free” land. However, bioenergy also holds a lot of potential for decentralized production, particularly in the case of raw materials such as *Jatropha*, castor oil plants and biogas, which can be converted into energy through simple technologies that can easily be installed on-site.
2. The crucial factors for usable biomass potential are, apart from population growth and the fertility of the land, above all the availability of fallow land and the food preferences of the population. The eating habits of the inhabitants of most industrial countries, dominated by meat and milk products, require two to three times as much land as a moderate diet (and three to four times as much as a vegetarian diet). In other words; sooner or later the question will arise whether agricultural land is to be used for energy crops or meat production. There’s a limit to combined usage.
3. The WTO agricultural negotiations and the reform of EU agricultural policy will continue to proceed in the direction of market access for third countries and the dismantling of internal subsidies. As part of this process, more and more agricultural land will be affected – land which can then be used for the production of biomass or renewable resources. However, this will happen only if there is a noticeable improvement of the economic and legal frameworks. Moreover, 85% of the agricultural land in Germany is needed for the production of meat and other animal products. A diet of less meat would free additional agricultural lands. It is therefore necessary to subject our eating habits to scrutiny to avoid using land in other countries for “our” bioenergy crops – land which is needed to feed the people in those countries.
4. Bioenergy crops currently have the greatest potential of all bioenergy resources. There is a great diversity of crops which can be used for energy production (i.e. oily seeds, starch and sugar crops) and many different cultivation systems and methods (e.g. agroforestry systems, perennial plants or combination cultivation).
5. The use of genetically modified organisms in the production of bioenergy raises many unresolved questions about risks and side effects. The technology involved also is linked to the centralized control of a few large companies over seeds and plant varieties.
6. In the main, experiences with cash crops in developing countries show that highly technical, industrial cultivation methods require comparably large cultivation areas. This means that sooner or later, high-

yield varieties with a corresponding need for soil, irrigation, fertilizers and pesticides will be planted. For this, often enough, subsidies are available. Under these conditions, positive environmental effects are

virtually unattainable. Furthermore, experience has shown that industrial farming displaces smallholders, causing concurrent negative social effects on the local population.

Recommendations:

1. Smallholder farm structures must be supported and protected.
2. The active promotion of diversified, low-intensity, bioenergy crop cultivation, with minimal use of fertilizers and pesticides and low-tillage farming is to be established world-wide.
3. From an environmental point of view, it is crucial to support innovative cultivation systems and methods (e.g. the introduction of agroforestry systems, perennial plants or mixed cultivation).
4. Synergies between ecology and economy are to be identified and rewarded.
5. Using genetically modified organisms to generate energy with biomass must not be considered an option.



Photo: WorldVision



Photo: Börse Stuttgart


Trade

1. The cultivation of bioenergy crops and the production of bioethanol in developing countries does not automatically mean that they will be exported. After all, most developing countries must themselves import expensive oil on the world market. The Brazilian bioethanol program also began with the substitution of imported oil. The USA, the second largest ethanol producer, produces exclusively for the domestic market.
2. The importing nations, including the EU, must have the option for differential treatment of imported bioethanol or wood in order to avoid the negative environmental and social consequences of large-scale bioenergy export, and to be able to provide better market conditions for sustainable bioenergy sources. In contrast to food and luxury foods, it remains to be seen if the European consumer is willing to pay more for, say, "fair trade" or "organic" gasoline. Whether better market conditions for bioenergy, identical for all consumers, can be achieved by means of the classification of certified ethanol as an environmental commodity (likely to be vulnerable to legal challenges) or by means of changes (long demanded by NGOs) in WTO agreements (allowing product distinction by process and production methods /PPMs) remains to be seen.
3. The WTO agenda calls for the elimination of all tariff and non-tariff trade barriers in the paper and wood sector by 2010. In light of the practice of overexploitation in most wooded countries, this objective has been labelled by NGOs as the "Global Free Logging Convention".
4. The Brazilian initiative of a special program for smallholder biodiesel production shows that large farmers and corporations need not be the only ones who profit from the production and export of bio-fuels. The participation of smallholders is secured by a social seal which links production support to social criteria.
5. For the EU, fuel and fuel additives such as ethanol as well as wood and wood products can be considered as biomass imports. Particularly wood raises considerable questions about overexploitation and sustainable methods of production. Systems of certification can include criteria which stipulate sustainable production methods.



Recommendations:

1. In no circumstances must the cultivation and export of bioenergy sources jeopardize a country's food supply. Governments must set the regulatory political framework needed to prevent this.
2. First priority must be given to local renewable energy sources, improved energy efficiency and energy conservation. The import and/or export of bioenergy should follow only to compensate for regional deficiencies. A certification system for international trade is absolutely necessary.
3. In using biomass directly for domestic energy needs, priority should be given to developing regional value-added chains, mostly in developing countries.
4. Under no circumstances should there be a reduction of tariff and non-tariff trade barriers in the paper and wood sector. The regulation of wood as a bioenergy source cannot be separated from the regulation of wood and wood products such as paper.
5. The EU must insist upon the development of an eco-fair certification scheme for sustainable bioenergy sources which guarantees privileged market access to the EU. To this end, export countries and NGOs must be involved, broad acceptance must be won and hidden protectionism prevented.
6. In the international trade with bioenergy, a certification scheme must be set into place which is based on quantifiable and qualifiable criteria, which can be easily comprehended and controlled. The scheme must create a system which leads to sustainable development in the countries of production.
7. Certification criteria must be set by all concerned and affected in a participatory process. Some of the criteria which must be taken into account for an eco-fair certification system are, for example: total energy consumption, sustainable agriculture, the method of cultivation, the distribution of added value, job creation and social impact.
8. In the case of wood, we recommend the further development of the FSC seal (forest stewardship council). Such seals are voluntary measures that can only work if certification brings an additional economic advantage. In this respect, a distinction must be made between wood for wood products and wood for bioenergy. For the consumer, a FSC-certified garden chair has a clear surplus value, whereas the acceptance of a higher price for fuel is certain to be far more difficult to gain.



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