

Bioenergy- fuel for the future?

A BirdLife International position paper on Bioenergy use in the EU

Executive summary

- Bioenergy has the potential to make a real contribution to the renewable energy mix which Europe must adopt to reduce global warming. However to realise this contribution **it must be produced sustainably** - resulting in real carbon savings (i.e. an effective carbon balance) and avoiding negative impacts to biodiversity and the wider environment.
- Bioenergy should be seen as a positive step forward only if it is **combined with measures aimed at increasing energy efficiency and curbing energy demand** in the context of a coherent overall policy which tackles climate change.
- Bioenergy production is already having significant impacts on biodiversity on a global level also, and the risk of a dramatic increase in the future is very serious for biodiversity rich areas like South East Asia, and South America.
- Bioenergy crops should be used with preference in the Agriculture sector as fuel for transport and on a small scale for heating and power production.
- Bioenergy crops can have either positive or negative impacts on biodiversity depending on crop type, location and farming practice. It should be **ensured that Bioenergy crops that are beneficial to the wider environment are encouraged while effective safeguards are put in place to prevent Bioenergy development from causing harm to biodiversity and the wider environment.**
- The forestry sector offers a good opportunity for the use of woody arising and thinning material as biomass for energy production but **it must be assured this does not lead to overexploitation of natural forests.**
- **Special attention should be given to Bioenergy crop or plantation expansion in key biodiversity areas such as Natura 2000 sites.** All projects and plans should be subjected to an appropriate impact assessment. Win-win solutions should be pursued, combining habitat management and restoration or increase in the biodiversity and environmental quality of farmland with the development of Bioenergy crops, but in the minimum preventing any damage.
- **Energy crops should not be grown on set aside land that currently provides precious and often unique habitat to threatened wildlife.**

- To guarantee these benefits and safeguards, we are calling for the **introduction of a system of accreditation for Bioenergy** which would measure its carbon benefits and ensure its production does not result in other negative biodiversity or environmental impacts. Such a system would best be brought in through **a specific EU Directive** and would cover Bioenergy imports from countries outside the EU as well.
- To maximise the general environmental benefit of Bioenergy crops there needs to be a strategic approach, which ensures that resources are exploited sustainably and **contribute to other policy goals such as the conservation of biodiversity and the Water Framework Directive**. Such a strategic approach would best be promoted through an EU Directive on the production, trade and support of bio-energy.
- In order to be sustainable in the long term Bioenergy must be **supported by a thriving energy market which rewards low carbon fuels and not through agricultural subsidies**.
- More **research is needed** at a national level to identify the most suitable Bioenergy sources, management, processing techniques and end uses.

BirdLife could not lend its support to a significant growth in the Bioenergy crop industry in the EU without a clearer understanding of its positive and negative effects, and without a strategic policy framework—including a certification scheme which takes into account both carbon balance and other environmental factors, including effects on biodiversity—that strives to ensure that negative effects are prevented and positive effects are maximised.

1. Introduction: Climate Change and Bioenergy

Bioenergy– energy released by burning biological material- cannot at present completely substitute fossil fuels due to the huge cropping areas that would be required. Nevertheless, Bioenergy can contribute to reducing the overall consumption of fossil fuels. It can take the form of solid material (biomass) for combustion or liquid products (Biofuels) that can be used to power vehicles. Both biomass and Biofuels can be derived from dedicated energy crops, agricultural co-products or waste materials. As energy crops are re-grown they take up an equal amount of carbon dioxide that was released when burnt – therefore theoretically yielding no net carbon dioxide emissions from their combustion. However, in practice, resource use in the form of inputs (e.g. fertilisers, pesticides), transportation and processing on an industrial scale means that energy crops do not usually provide a truly carbon neutral energy source. The level of carbon savings compared to conventional fossil fuels can vary greatly depending on these variables. Growing energy crops at a large scale is bound to have significant effects on the countryside and on wildlife that lives in it. Such impacts may range from extremely negative to beneficial.

This position paper sets out the measures that BirdLife would like to see to ensure that the maximum carbon benefits can be gained from Bioenergy whilst safeguarding biodiversity and the wider environment. This position paper refers mainly to Biofuels derived from agricultural crops and to biomass derived from agriculture and forestry production. It does not deal with other sources of biomass that have lesser direct effects biodiversity such as various types of waste and sludge.

2. Uses of Bioenergy

The use of Bioenergy crops should contribute to the reduction of greenhouse gas emissions and thus the slowing of climate change and its negative impacts. Bioenergy can be used to produce fuel for the transport sector or through biomass combustion to produce heat and/or power.

There is a need to improve vehicle efficiency, reduce road transport and move towards the use of low carbon fuels. Biofuels appear to be the most viable low carbon transport fuel option in the short to medium term. To promote the use of low carbon fuels, BirdLife supports the principle of a ‘well-to-wheel’ (full life cycle) carbon fuel duty system which covers all transport fuels. This would give real incentive to the use of low carbon fuels.

Current evidence suggests that using biomass for small-scale combined heat and power will provide the greatest carbon benefits from Bioenergy. If this were the case, it may

also reduce the potential negative impacts on biodiversity by encouraging local small scale production which could be designed to benefit local biodiversity.

Given the large land area that Bioenergy crops would require, they cannot fully replace conventional fossil fuels, except perhaps within the farming system itself. Nevertheless, they can helpfully contribute to lowering the overall consumption of fossil fuels in the transport sector and even replace them in the farming system, both as fuel for engines and as heat source (for instance in greenhouses). Indeed **the agricultural sector, due to the proximity between production and consumption and the huge potential for small scale, on site transformation, should be seen as a priority for the use of Bioenergy. Farmers should be encouraged and assisted in creating local Bioenergy markets that are compatible with their local environment.**

3. Impact of Bioenergy on Biodiversity

The use of Bioenergy provides opportunities for farmers, the environment and biodiversity. However as well as potentially benefiting the environment and biodiversity, the development of Bioenergy crops also introduces a number of threats to biodiversity and the environment. These opportunities and threats are set out below.

3.1.1. Opportunities

- **Increased renewable energy production** reducing climate change which in turn could result in habitat destruction and degradation, and thereby threaten biodiversity.
- **Increased diversity of land use** due to the introduction of crops that are beneficial to biodiversity and/or mixed cropping systems. Increased crop heterogeneity has been linked to higher biodiversity, in contrast to monocultures and block cropping which are associated with declines in biodiversity as they provide a narrower range of food sources and habitat for farm wildlife.
- **Introduction of lower input regimes** to improve the carbon balance of crops which are currently intensively produced and an associated reduction in the direct and indirect effects of pesticides on biodiversity and water. Some energy crops can be grown with minimal chemical inputs and /or with high water efficiency. Their development should be encouraged and could contribute to an overall decrease in the environmental impact of agriculture.
- **New markets for products deriving from existing habitats, important for biodiversity conservation, and which** historically were managed for fuel such as reedbeds or a new end use for biological material currently without a market value such as hedge trimmings.

3.1.2 Threats

- **The replacement/ cultivation of high-biodiversity value areas**, such as pristine habitats, semi-natural habitats and unimproved grassland with Bioenergy crops or Bioenergy forest plantations which are not beneficial to biodiversity.
- **Incentives for the cropping of set asides** that would otherwise be used as wildlife refuges or for habitat restoration.
- If given specific production support, Bioenergy crops could out- compete agri-environment schemes that are beneficial to biodiversity, due to higher payoffs. This could be especially risky for agri environment schemes linked with set aside (see above).
- **Increased landscape homogeneity due to single crop expansion.** Any large-scale uptake of a specific crop leading to a similarly large-scale change in land-use and the simplification of cropping patterns, either at the local or national level, would be highly detrimental to biodiversity.
- **The environmental impact of a specific crop**, in particular genetically modified crops or newly introduced crops that have specific management and agro-chemical requirements which could be detrimental to certain species, or could become invasive or hybridise with other crops to become invasive.
- **The unsustainable intensification of forest exploitation** through the disturbance and clearing of high natural value forests, felling operations during the breeding season or expansion of the forest road network.

3.2 Impact of Bioenergy on biodiversity on a global level

Currently large volumes of Biofuels are imported into the EU and more are projected to arrive; this includes bioethanol from South America and South Asia and palm oil from South East Asia. There is a significant risk that, unless controls are put in place, increasing demand for such fuels will result in damage to biodiversity rich habitats in biodiversity rich continents such as Asia and South America, for example palm plantation expansion is one of the most important driving forces behind tropical deforestation. **An international certification scheme must be developed to guarantee that Bioenergy crops are delivering emissions savings and are not causing environmental destruction and biodiversity loss in those regions.** This would allow the provenance of such materials to be clearly identified and establish an audit trail.

4. Recommendations

To make the most of the opportunities and to limit the threats, BirdLife is calling for safeguards to be implemented to protect the environment and biodiversity and to guarantee carbon savings. These include the introduction of a system of accreditation and a strategic approach to the exploitation of Bioenergy resources. **Energy crops should not be assessed solely on the basis of their economic and carbon performances but also taking into consideration their wider environmental impacts and in particular the way they contribute to biodiversity conservation, or alternatively, the way they may damage it. Such a joined up approach is consistent with the EUs commitment to sustainable development.**

4.1 A Strategic Approach

There are number of issues that remain unclear in the overall approach to the growth and use of Bioenergy. For example, is it better to use Bioenergy crops for heat and power or for fuel for the transport sector? Is bioethanol better for the environment in the long-term than biodiesel? What will be the wider environmental impacts of large-scale growth of Bioenergy crops? What is the environmental impact of new, so called synthetic designer fuels such as BtL (Biomass to Liquid)?

It is important to have a much better understanding of the likely effects of the large-scale use of Bioenergy crops, and a clearer strategic framework for their development, before embarking on ambitious policy programmes to support their development at particular scales. Therefore, BirdLife advocates the following approach:

- **The development of Bioenergy should be promoted only in the framework of a coherent energy policy aimed at tackling climate change.** Switching from fossil fuels to Biofuels can only make sense if it is part of an overall strategy that covers increased fuel efficiency, curbing energy demand, general energy saving moves, and structural changes to the way energy is consumed (for example favouring public transport over private cars).
- In order for Bioenergy crops to deliver the benefits they could, they **must be produced sustainably** - resulting in real carbon savings (i.e. a negative carbon balance) and avoiding negative impacts to biodiversity and the wider environment
- Targets and timetables should be formulated that **allow development to expand incrementally**, at a pace and in ways that would allow for strategic changes of direction should information from assessment and monitoring reveal unforeseen and negative effects.

- **Medium and long-term indicative targets and timetables** for both biomass and Biofuels should be developed, as well as research, assessment programmes and practices to ensure that the targets are met sustainably. An assessment should be made of how these targets can be reconciled with the competing demands for agricultural land.
- **Break points and thresholds** for review should be built into the process.
- **Environmental and biodiversity safeguards should be built into the process** from the start and remain central to it at any stage. **Special care must be taken in respect of development of Bioenergy crops in high value biodiversity areas such as Natura 2000 sites.** Any plan or project designed to foster the cultivation of Bioenergy crops in those areas should be subjected to an Environmental Impact Assessment in order to guarantee that no harm is done to protected species and habitats. Any public incentive to crop production and transformation should ensure the crops and practices involved are compatible with the conservation objectives of the sites. Plans to boost Bioenergy crop production should be integrated with the Natura 2000 site management plans so that win-win solutions can be identified and promoted (for example encouraging the energetic use of reedbeds that need to be regularly cut, or introducing mixed energy crop systems in areas where increased habitat complexity is a conservation priority).
- These **safeguards should include a ban on ploughing up grasslands and other valuable habitats, a crop rotation with at least three different crops and a precautionary moratorium on growing GM crops. Set aside land should not be used for energy crops production** until an equivalent area is set aside for environmental management as it represents an important refuge for wildlife in agricultural landscapes. Energy crops should rather be produced on productive land and provide a substitute for uncompetitive food crops.
- The development of energy crops should be encouraged in ways that **create synergies with other EU policies and contribute to achievement of environmental priorities such as halting the decline of biodiversity and implementation of the Water Framework Directive.**

Such a strategic framework is crucial in designing future specific support measures and policies to determine the types of Bioenergy crops that might be grown, and the rates and locations at which development would take place. To introduce further support measures in the present strategic and information vacuum invites the risk of creating unforeseen environmental or other negative consequences, including to biodiversity. These risks are potentially significant.

4.2 A Certification Scheme

The full benefits of Bioenergy crops will only be realised if the industry is operated in such a way as to maximise carbon reduction and to minimise negative impacts on biodiversity and the wider environment. Climate change mitigation can only go hand in hand with biodiversity conservation. To realise these benefits, **accreditation for both life-cycle carbon savings and environmental impacts (including biodiversity) is essential.**

BirdLife recommends that a certification scheme is developed as a priority measure, designed to guarantee and monitor the emissions savings and environmental impacts (including on biodiversity) of Bioenergy crops. Ideally these should be developed through an agreed international framework. A certification scheme should also ensure real carbon saving as well as the avoidance of any other form of environmental damage arising from the production or use of the fuel, including direct and indirect damage to biodiversity—for example, through intensive cropping on set-aside land or any land of high biodiversity value. **BirdLife could not support further development of the Bioenergy crops industry without an appropriate certification scheme in place—including carbon and wider environmental, including biodiversity, impact factors – is introduced along side other promotion measures. The creation of such a system, that needs to have an EU wide scope for being effective, would be best dealt with through a specific EU Directive. The certification scheme should also cover Bioenergy crops grown in countries outside the EU and imported in the EU, to guarantee that Bioenergy crops are delivering emissions savings and are not causing environmental destruction and biodiversity loss in regions of high biodiversity value like Asia and South America. This system would allow the provenance of such materials to be clearly identified and establish an audit trail.**

4.3 Financial support for Bioenergy crop production

In order to ensure that Bioenergy is sustainably produced and geared to maximising carbon reduction benefits **it must be supported through the energy market and not through agricultural subsidies.** Although the production of Bioenergy does have the potential to offer new markets for farmers this should not be the primary aim of stimulating a Bioenergy market. In Europe, in particular, we have witnessed the damage that blunt agricultural subsidy tools can cause. By encouraging the production of goods for which there is no market demand, production subsidies have resulted in increased intensity of production which has severely damaged biodiversity and has distorted world markets, as excess produce is dumped on developing countries.

By encouraging the production of low carbon fuels via the energy market, production of Bioenergy can be geared towards achieving real carbon reduction. This would mean

that no production related payments and no derogations to cross compliance rules should be granted to energy crops. **Where there is an identified market, it may be appropriate to use Axis 1 and/or 3 of rural development funding to support the establishment of new Bioenergy businesses.** However these should be subject to an Environmental Impact Assessment and the production of the crop should be governed by agreed environmental standards and be certified in the way described earlier.

The **rural development fund Axis 2 financing should not be used to support Bioenergy crops** but rather better land management practices, including those that can contribute to the reduction of greenhouse gas emission from agriculture. **Under no circumstances should agri- environment schemes be used to support the production of energy crops that do not offer specific benefits to biodiversity, water quality and other local environmental concerns.**

4.4 Research Requirements

To inform the establishment of a strategic framework for the development of Bioenergy crops and to monitor subsequent progress, it is necessary to undertake further research in a number of areas. BirdLife believes the following research is required:

- **An assessment of the risks and opportunities posed by novel Bioenergy crops** to the environment and biodiversity. This should lead to the development of best practice guidelines for Bioenergy production.
- **An assessment of the probable effects on biodiversity of different types of Bioenergy crops** grown in different areas, under different intensity levels, with different inputs (e.g. fertilisers and pesticides), and at different scales, including the scales desirable to mitigate climate change.
- **An assessment of the life-time carbon balances of different crops**, grown in different areas and under different intensity levels, converted to different fuel media, and used in different applications.
- **Development of new mixed cropping systems** and breeds which provide high yields at low or zero pesticide and fertiliser input.
- **Monitoring mechanisms** required to ensure continuing carbon benefits and protection of the environment.

November 2005