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WOODLAND TRUST

Position statement: Bioenergy in the UK

Summary

The bioenergy industry is developing apace in the UK, driven by national policies that are cascading down from the pursuit of Kyoto targets, and EU legislation. Developments in bioenergy offer positive opportunities for woodland creation, improving biodiversity of existing woods, and for making agricultural areas more permeable to woodland wildlife, but there are also environmental risks if production is purely driven by markets without any checks and balances. It is essential that policy catches up with practice, particularly with regard to environmental impacts of bioenergy, so that the positive opportunities for enhancing biodiversity and delivering other environmental benefits are maximised, and negative impacts are avoided.

Definitions[1]

Bioenergy is the inclusive term for all forms of biomass and biofuels. Bioenergy can be produced from:

- Wood based fuels, eg short rotation coppice (SRC), short rotation forestry (SRF), forest residues and low-grade timber
- Perennial grass crops eg *Miscanthus* (elephant grass) reed canary grass and switch grass
- Conventional crops eg sugar beet, cereal crops, sorghum, oil seed rape, linseed and sunflowers
- Waste eg cow and pig slurry, poultry litter and wood waste such as old pallets

Biomass: the biodegradable fraction of crops, waste and residues from agriculture, forestry and related industries used as a source of renewable heat or energy.

Biofuels are renewable fuels and include bioethanol and biobutanol produced from biomass, biodiesel produced from vegetable or animal oil, of diesel quality, and biogas, gas produced by the anaerobic decomposition of organic matter.

Current biofuels are produced mainly from conventional crops such as wheat, sugar beet or oil seed rape, and internationally from products like palm oil. However, research is increasingly focusing on "second-generation" biofuels which, as well as offering greater greenhouse gas savings, appear to be more compatible with petrochemicals. They include ethanol produced when woody material, including straw, is subject to an enzyme process to break down cellulose and hemi-cellulose to release sugars. Second-generation biofuels would enable a move away from intensively managed annual crops to more carbon-efficient multi-annual crops, including short-rotation coppice and other woody biomass.

The current situation

In 2008 the Government pledged to reduce national CO2 emissions by 80 per cent by 2050[2], compared with 1990 levels. It is committed to producing 15 per cent of energy from renewable sources by 2020, its contribution to a EU target enshrined in the EU Renewable Energy Directive. In its Renewable Energy Strategy, published in 2009, the Government suggests 30 per cent of this target could be met by bioenergy[3].

In the UK, the Renewables Obligation (which relates to electricity production) and the Renewable Transport Fuels Obligation, are the primary policy instruments stimulating increased production and use of energy crops. A Renewable Heat Incentive is due to be introduced in 2011. A number of capital grants

programmes and other financial incentives exist to stimulate the production and use of bioenergy, including the Low Carbon Buildings Programme, the Bio-energy Infrastructure Scheme, and payments for certain energy crops under the Rural Development Programmes in each country.

Bioenergy can offer huge carbon savings, since the carbon emitted by burning biomass or biofuels is balanced overall by the carbon taken in by the crops as they grow. However, the carbon and environmental costs of growing, harvesting, transport and processing, need to be taken into account. Use of biomass and biofuels is not, therefore, carbon-neutral, as is sometimes suggested. It can be better described as "carbon-lean", since it offers considerable greenhouse gas savings when compared with burning fossil fuels. The "life-cycle analysis" required to calculate the level of carbon savings has been attempted, but different results have been obtained in the various studies. In general, though, these show that the greatest greenhouse gas savings from bioenergy can be made by

- the gasification of biomass to produce electricity
- the burning of woodchip to generate heat, and
- the use of "second-generation" biofuels produced from biomass[4].

Opportunities and threats

Bioenergy crops currently cover a small percentage of land in the UK. This is likely to increase, but bioenergy can never be more than a small part of the solution to climate change in the UK, because of all the other pressures on our land. For example, to meet just one-third of the government's 2010 target for electricity from renewables would require 1.2m ha of short rotation coppice and Miscanthus[5]. This is equivalent to about 20 per cent of the UK's arable land. Similarly, to meet the 5 per cent by 2010 target on biofuels would require between 1.2m and 1.9m ha of additional wheat and oilseed rape[6]. So other technologies, such as offshore wind and tidal power, have far more potential to provide the bulk of renewable energy in future but bioenergy including woodfuel has the potential to fill a short-term energy gap and provide a low level source of renewable energy well into the future.

Without appropriate checks and balances to ensure sustainable implementation, there is a danger that bioenergy development could displace other important land-uses: food production, land for nature conservation and recreation. The UK's bioenergy industry currently relies on imported raw materials e.g. palm oil, and this is likely to continue, but the issues are exacerbated here, on a global scale, with rapidly increasing and vociferous concern about clearance of tropical rainforest, displacement of poor farmers, and replacement of food crops with plantations of soya, sugar cane and other crops for biofuel production.

Within the UK, bioenergy developments could offer some really positive opportunities for woodland and its wildlife. The stimulation of markets for wood products (low grade timber and forest residues, SRC and SRF) for production of heat, power, or second generation biofuels could lead to:

- Expansion of native woodland and increase in tree cover, and buffering of sensitive woodland eg ancient woods with low-intensity new planting
- Restoration of Plantations on Ancient Woodland Sites (PAWS)
- Bringing woods into sensitive and appropriate management, where it can be demonstrated that this will have biodiversity and/or social benefits
- Renewing public and political appreciation for the value of woodland to society.

For example, in Scotland it is proposed that new woodlands could be producing over 1 million oven dry tonnes of woodfuel per year by 2050, over and above woodfuel production from existing forests.[7] In England, the Forestry Commission's Woodfuel Strategy[8] focuses more strongly on management of currently unmanaged woods for production of woodfuel, and less on woodland creation, citing a decline in woodland biodiversity as a reason.

Additional benefits include improvement of "ecosystem services" eg replacing traditional arable crops with SRC could lead to improved soil and water quality because if done correctly it requires lower inputs of fertilisers and pesticides, and planting tree species can help to reduce soil erosion. Even perennial grasses, or conventional arable crops planted for biofuels, might lead to reduced intensity of land-use, depending on where they are planted, the land-use they replace, and how they are managed, contributing to the Trust's vision of a landscape that is more permeable to wildlife enabling adaptation in the face of climate change. Bioenergy development could also reinforce the role of woods in sustainable development, especially through economic benefits for landowners and local economies. The

However, bioenergy also poses some real threats. Planting of energy crops on semi-natural or other valuable unprotected wildlife (UKBAP) sites is a risk if demand for bioenergy continues to rise in the UK. In some areas, there may be an intensification of land-use, particularly where biofuel crops are clustered around processing plants. Large areas of monoculture, and the possible introduction of fast growing genetically modified energy crops also pose a threat to wildlife. The effects of non-native species (e.g. Miscanthus) on established wildlife are currently relatively unknown in the UK and have not been adequately researched.

In existing woods, there is a risk that increased light levels that would follow from more active management for bioenergy, combined with increased nutrient levels in many woodland soils, could actually adversely affect biodiversity[9].

The Woodland Trust's view

The Woodland Trust believes urgent measures are needed to mitigate climate change, reducing greenhouse gas emissions by curbing energy consumption, increasing energy efficiency, and the use of renewable energy sources that provide real carbon savings[10].

The Woodland Trust supports the development of bioenergy in general and woodfuel in particular where it offers genuine greenhouse gas savings, where it does not negatively impact on biodiversity, and, if possible, delivers positive biodiversity benefits.

- The Woodland Trust believes that over-arching all policies on bioenergy must be a recognition by Government and others of the need to **reduce consumption** through energy-saving measures While sustainably produced bioenergy offers positive opportunities it is likely only to be a relatively small part of the solution to the problem of climate change in the UK.

- We would like to see greater emphasis on the opportunity afforded by the woodfuel market for creation of new native woodland.

- In existing woods, we positively support management that results in production of woody biomass where it is clear this will bring biodiversity benefits, eg restoration of PAWS, or where there are species dependant on continuity of particular types of management such as coppicing. We would urge a precautionary approach in ancient woods, with any management aiming to protect valuable features characteristic of this habitat.

- The Trust supports the development of small-scale, local biomass projects such as wood-fuel heat and power, which minimise the costs and carbon emissions associated with transport.

- To ensure that bioenergy delivers genuine greenhouse gas savings, without negative environmental impacts, **it must be subject to a robust system of assurance or certification.** For

the production of woody biomass this means UK Woodland Assurance Standard and Forest Stewardship Council certification, but there is currently no equivalent for agricultural crops. Any certification system must be internationally agreed to avoid the problems simply being pushed overseas.

- Current evidence is that the greatest potential greenhouse gas savings can be achieved through burning of woodchip to generate heat, gasification of biomass to produce electricity and the use of second generation biofuels produced from biomass. The Woodland Trust would therefore like to see bioenergy policies place greater emphasis on the use of woody biomass crops for these purposes, rather than on agricultural crops such as sugar beet and wheat for the production of biofuels.

- The Trust would like to see more research carried out into the biodiversity and landscape impacts of bioenergy crops.

- Based on our current position statement on GMOs, the Trust is opposed to the development and use of GM crops for bioenergy[11].

What this means for the Woodland Trust, our woods and our work

- We will promote use of woodfuel where this can bring real woodland biodiversity benefits. For example, development of woodfuel markets may stimulate planting of new native woodland for small-scale local use. Our work to restore PAWS on our own sites, and to encourage others to restore their PAWS sites, while undertaken to benefit biodiversity, may also support small-scale local woodfuel projects. Where possible, we will work with local initiatives of this kind, thus demonstrating that biodiversity gains can be secured alongside bioenergy production.

- While bioenergy production is not a primary objective in managing other kinds of Woodland Trust sites, such as semi-natural woodland or woodland creation sites, the Trust may supply timber from its own woods to such projects where the felling of trees is part of an overall management plan aimed at achieving the Trust's objectives of improving woodland biodiversity and public understanding and enjoyment.

- The long term carbon storage role of the woods we own is a valid long term contribution to climate mitigation measures.

- If and when a credible assurance scheme is developed, the Trust will promote the use of biofuels in its own fleet of vehicles, and by its contractors, where such biofuels can be shown to come from a truly sustainable source.

References

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