

Natural England Board

Meeting 8
12 December 2007



Paper No: **NEB PU08 06**

Title: **Natural England's Draft Policy on Bioenergy**

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1. Purpose

- 1.1. This paper presents a draft bioenergy policy for Natural England informed by discussion with Board Outcome Group 4 in September. Board members have also been briefed on bioenergy and particularly liquid biofuels issues at a workshop in Sheffield in October. Two annexes are also attached, detailing bioenergy terminology and the main economic and policy related drivers for current bioenergy generation.
- 1.2. This draft policy is the first in a series of energy related policies to be presented to the Board over the next twelve months. Papers covering wind energy and wave and tidal energy are expected to be discussed at the March and August 2008 meetings.
- 1.3. Within this paper bioenergy refers to the general term for different forms of energy generated from a variety of biomass feedstocks, including plant material, vegetation and agricultural waste such as manures and slurries. These are used to produce heat, electricity and transport fuels. All have the potential to contribute towards mitigating climate change and the UK's growing fuel security issues; whilst additionally providing a boost for the rural economy.

2. Recommendation

- 2.1. It is recommended that the Board approve the draft policy which would then be taken forward for external stakeholder consultation and subsequently signed off by Chair.

3. Overarching policy framework

- 3.1. Natural England recognises that climate change poses the most serious long-term threat to our natural environment and supports measures that can help tackle its causes. We are also of the view that the agriculture, forestry and land management sector can make an important contribution to climate change adaptation and mitigation, whilst also making a contribution to fuel security, rural development and other environmental benefits.
- 3.2. Biomass crops and production techniques are developing rapidly. There is good evidence on the general impacts these will have on the natural environment. The specific impacts of biomass crops in particular locations

will depend on a range of factors which need to be assessed on a case by case basis. Conversion of biomass to energy is also not a carbon neutral process and is dependent on factors including feedstock type, cultivation and processing techniques, land use change, transportation and end use conversion technologies.

- 3.3. Natural England's draft policy reflects the need to objectively assess the environmental implications of increasing bioenergy crop production in England and where possible avoid any adverse impact on biodiversity, soils, water resources and landscape diversity and the historic environment.

4. Natural England's draft bioenergy policy

- 4.1. Natural England believes that the sustainable production of bioenergy can form an integral part of the Government's overall strategies and targets for reducing greenhouse gas emissions, delivering renewable energy targets and promoting sustainable agriculture. We will work proactively with land managers, the bioenergy industry and through the planning system, to identify how and where feedstock or bioenergy production in England can be increased.
- 4.2. Natural England will keep under review the development of the bioenergy industry. We will gather the necessary evidence to underpin our policy, guidance and support and will work towards a robust national framework for the assessment of the environmental impacts of bioenergy crops, as part of a wider land use strategy. In short, we wish to see the right type of crop, grown in the right places using the right techniques, delivering significant reductions in greenhouse gas emissions.
- 4.3. Natural England believes that bioenergy crops should not be planted on natural and semi-natural land. We also believe that the environmental benefits which have become associated with land that has been extensively managed or for conservation purposes (such as some marginal land and set aside) should not be lost.
- 4.4. Natural England believes that all bioenergy strategies, policies, drivers and development should include a full life cycle assessment of the carbon balance across the supply chain. Government support should be targeted at the most carbon efficient supply chains, with priority given to the use of existing biomass resources (forestry waste, waste vegetable oil, municipal solid waste, and sustainably managed woodlands), to minimise pressure on land use and to aid reductions in waste going to landfill.
- 4.5. Natural England believes that Government should undertake a strategic assessment of the potential growth of the bioenergy sector in England, together with its cumulative impact in terms of land use change, competition with food production and urban development, upon agri-environment scheme uptake and the adaptation of the natural environment in the face of climate change.
- 4.6. Although Natural England's focus will primarily be on the impact on England's natural environment, we will also consider the implications of increasing production on the global natural environment.

- 4.7. Natural England will work to deliver exemplary bioenergy cropping through the Energy Crops Scheme, ensuring that all applications are subject to an environmental assessment to ensure minimal adverse impact on the natural environment.
- 4.8. Natural England believes mandatory certification should be introduced to ensure minimum standards of carbon saving and environmental sustainability for larger scale bioenergy production. Natural England particularly wishes to see the rapid development of UK, European and global standards for biofuels and co-fired biomass. We will press the UK government to work towards this goal for liquid biofuels delivered under the Renewable Transport Fuels Obligation and for biomass co-fired under the Renewables Obligation.
- 4.9. Natural England will investigate and where appropriate: incorporate biomass heat and combined heat and power systems within its own estate, run any fleet cars on a biofuel mix and connect Natural England reserves to local woodfuel networks.

Annex 1

Bioenergy: terms and definitions

Bioenergy is the general term for different forms of energy generated from a variety of biomass feedstocks, including plant material, vegetation and agricultural waste such as manures and slurries. These are used to produce heat, electricity and transport fuels.¹

In general, bioenergy can be divided into three categories:

Biomass for electricity and heat

Biomass is a generic term for any organic material, but has come to be used to encompass bio-feedstocks used to produce heat, cooling and/or electricity. There are four basic groups of biomass material:

- Woody energy crops: timber, short rotation coppice and short rotation forestry;
- Grasses: such as Miscanthus (elephant grass), switch grass and reed canary grass;
- Agricultural residues: cereal straw, manures, forest thinnings, brash and conservation wastes;
- Wastes: sewage sludge, landfill refuse, waste wood, farm/animal waste and domestic green waste.

The main uses of biomass are for co-firing in major power stations, for dedicated heat production and combined heat and power generation; at a variety of scales.

Liquid biofuels (renewable transport fuels)

These are transport fuels derived from non-fossil organic matter which can either be blended with conventional fuels or used as a replacement. Liquid biofuels are generally produced from conventional crops. Starchy feedstocks such as wheat and sugar beet are generally used to produce bioethanol, whilst oil producing crops such as oil seed rape, palm and maize are used to produce biodiesel. Typically bioethanol is used in combination with petrol (in various proportions from 10% up to about 70%) or can be used as a fuel on its own.

Various vegetable oils, including recycled cooking oil, can also be used to refine biodiesel. Biogas can also be used as a transport fuel, but infrastructural investment is needed to encourage its uptake and use.

There are also a range of emerging technologies that use more advanced processes, that are in the early stages of commercialisation; or that use new feedstocks, such as marine algae. Many of these technologies offer higher potential conversion efficiencies compared with first generation technologies, since they utilise the whole plant. These are often referred to as second or third generation biofuel technologies.

¹ Further detail of the current situation, policies and drivers for bioenergy production can be found in the briefing supplied for the October 2007 Board workshop on bioenergy. This is available for reference if required.

Biogas

Biogas is a gas mixture comprising mainly methane and carbon dioxide, produced through anaerobic digestion. Solid fertilisers are also a by-product. Compared with biomass for heat and electricity and transport biofuels, government support for biogas from agricultural sources is limited, with the predominant production from sewage plants and landfill sites.

Annex 2

Bioenergy Drivers

The government has four key priorities driving forward its energy strategy, set out in the Energy White Paper (DTI, May 2007): security of energy supply; climate change; promoting competitive markets, and ensuring that every home is adequately and affordably heated. Bioenergy has a potentially important role to play in all of these priorities.

The government's main climate change mitigation target is for a 60% reduction in CO₂ emissions by 2050, to be reviewed by April 2009. Correspondingly the main target for renewable energy is to grow the market to 10% of total electricity generation by 2010, with the aspiration to double this by 2020. This is reinforced by the EU's binding GHG reduction target of 20% also by 2020. The aim is to stimulate a tripling between now and 2015 of electricity from renewables (15% of total supply).

In 2006, renewables accounted for only 2.8% of total UK energy use. Bioenergy (including landfill/sewage gas, the co-firing of biomass in coal-fired power stations and transport biofuels) accounted for 82% of renewable energy sources used, with most of the remainder coming from large-scale hydro and wind generation.

In terms of electricity generation, renewables accounted for 4.6% of electricity generated in the UK in 2006. Biomass contributed over 80% of this renewably generated electricity, with the majority coming from co-firing (burning biomass in conjunction with conventional fuels such as coal), with much of this material obtained from imported feedstocks.

In terms of transport fuel sales renewables (biofuels) accounted for 0.5% of all road transport fuels sold in the UK in 2006

There are a number of incentives that have been put in place or are in development by the Government to encourage the development of these targets that have direct relevance to the development of bioenergy markets. Two of the main drivers in the UK are:

1. The Renewables Obligation (RO) introduced in 2002 promotes energy generated by renewable sources by the use of tradable certificates (ROCs) amongst electricity generators. Targets for England, Scotland and Wales are that by 2010 10.4% (and 15% by 2015) of sales from licensed electricity suppliers will be generated from eligible renewable sources, subject to the cost to the consumer being acceptable.

The Government aims to reform the RO from 2009 and to provide differentiated support levels (bands) to different renewable electricity technologies, giving more ROCs to technologies falling behind in the energy investment market and to give additional certainty on long-term ROC prices. In effect, if implemented these proposals would stimulate investment in UK bio-feedstock production.

In addition to the re-banding described above the RO consultation proposes to remove the cap from the amount of biomass for co-firing, with the intention of increasing the volumes of biomass used..

2. The Renewable Transport Fuel Obligation (RTFO), administered by the Department of Transport (DfT), will run from 2008 onwards. The scheme places an obligation on fuel suppliers to source 5%_{vol} of total fuel sales from liquid biofuels by 2010. The intention is to raise this threshold beyond 2011, as long as sustainability/cost concerns can be overcome. These targets aim to bring the UK in line with the EU binding minimum target for 10%_{energy} of road transport fuels to be obtained from renewable sources by 2020.

The scheme will establish minimum environmental standards for feedstocks and reporting of the carbon saving potential. In the first instance reporting will be voluntary and companies will not be penalised for poor performance, however, lists of the poorest performers will be published as an incentive to improve. In 2010 the link with carbon saving will be established and in 2011 the minimum environmental standards will become compulsory. The UK RTFO is leading the way in the EU in terms of sustainability reporting.

As well helping the UK meet its renewable energy and greenhouse gas reduction targets, it is recognised that the development of the biomass sector can contribute towards other government targets for diversifying farm incomes, encouraging rural business and boosting local employment markets.

The Government's Biomass Strategy (Defra. May 2007) outlined targets to increase production of wood from currently unmanaged woodland (including increasing the recovery of wood from managed woodland) to 1 million tonnes per annum in England. The strategy also aims to increase the total land availability for biofuel and energy crops to around 1 million ha - 17% of total UK arable land. In addition, the strategy commits to increasing supply from organic waste materials such as manures and slurries (anaerobic digestion) and acknowledges that imported biomass is expected to continue to play a significant role (well over half of the biomass for co-firing and transport biofuels is currently imported).

The Forestry Commission's Woodfuel Strategy (April 2007) identifies measures needed to deliver an additional two million tonnes per annum from existing woodlands, with a focus on currently under-managed woodland. There is also a government drive to open up the carbon reduction possibilities of using local heat and electricity generation i.e. via distributed / decentralised energy, microgeneration, district heating schemes, combined heat and power and biomass fuelled heating; particularly at the community and industry scales.

Support for the planting of energy crops (short rotation coppice and Miscanthus) is provided by the Renewables Obligation (for electricity generation), Energy Crops Scheme and other grant schemes such as Energy Aid (up to €45 per hectare of energy crops) and the Bioenergy Infrastructure Scheme.

The second round of the Energy Crops Scheme (2007 to 2012), will be funded through the Rural Development Programme for England. The scheme is administered by Natural England and offers first year establishment grants for short rotation coppice (willow and poplar) and Miscanthus. The scheme opened for application in October 2007 and all applications to the new scheme will go through an environmental appraisal of potential impacts on soil and water, landscape, biodiversity, archaeology and the historic environment, local residents and recreation.