# Deforestation diesel – the madness of biofuel

A year ago we wrote in the *Bulletin* – "Beware of biofuels". We listed our concerns that such sources of energy are not as green and sustainable as many commentators suggest, with a real threat of re-introducing vast swathes of mono-cropping to developed farm economies such as the UK. Even worse is the likelihood that far from protecting endangered habitats such as the forests of Indonesia or Brazil, biofuels will actually accelerate their decline as trees are cleared for palm oil plantations, sugar cane and vast cereal fields destined for ethanol production. Little wonder then, that in some quarters biofuels are tagged as "deforestation diesel" – as the natural world dies to fuel our driving.

Our concerns remain just as profound today. There is a real danger that the techno-fix of biofuels allows governments and companies to avoid proper engagement with far more sustainable solutions in tackling climate change and in fundamental reform of transport and lifestyle behaviour.

The question has to be asked – are we prepared to destroy habitat, slash biodiversity, put food supplies at risk and even destroy established social structures for our energy thirst? Is conservation to be upstaged by consumption?

Bio-fuels are often seen as attractive components of a low-carbon energy economy because they are seen as "renewable". Carbon emitted to the atmosphere when bio-fuels are burned is offset by carbon removed from the atmosphere by growing energy crops. But even simple energy inputs and outputs from biofuel crops fail to add up. Growing maize as a feedstock for biofuels is reckoned to use 30 per cent more energy than the finished fuel provides. George Bush's new found love affair with bioethanol will therefore still gobble up the world's rapidly diminishing fossil fuel reserves.

**Putting the squeeze on food**

If bio-fuels do become major crops, they will be in serious competition for land with food. Across the world, the UN Food and Agriculture Organisation and the US Department of Agriculture estimate that the 2006 world harvest won't be enough to feed everyone for the sixth time in seven years. The move to bio-fuels exacerbates the problem while increasing the amount of carbon dioxide in the atmosphere. Food production dropped from 2.6 billion tons in 1994 to under 2 billion tons in 2006, while food stocks dropped from enough to feed the world for 116 days in 1999 to 57 days in 2006.

The US Department of Agriculture also reports world wheat stockpiles at the lowest level in 25 years. Global wheat production is expected to drop causing stock levels to fall further to a level some 20% below 2005. This could have a serious impact on food aid to Africa and other hungry areas in the year ahead. None of this is helped by a crop production switch from food to fuel. Projections of land required for bio-fuel

production in Europe show that the current EU position - that we are cultivating too much land, so that some should be "set aside" - will be rapidly reversed by the development of bio-fuels.

**A flawed policy**

The chief policy vehicle in the UK for encouraging biofuel development and use is the Renewable Transport Fuel Obligation (RTFO) with accompanying sustainability and greenhouse gas reporting mechanisms. The RTFO will require fuel companies in the UK to replace 2.5% of their total transport fuel with biofuels by 2008/09, 3.75% by 2009/10 and 5% by 2010/11.

A recent report commissioned by engine maker Rolls Royce says the final figure is equivalent to 1.2 billion litres of bioethanol and 1.35 billion litres of biodiesel. If this were to be produced in the UK, 1.2 million hectares would be required, about 20% of the UK's arable land. In reality, all the major biofuel processing plants are being developed in close proximity to ports and much of our biofuel requirement will be imported and based on soy and palm oil (biodiesel) and sugar cane (bioethanol).

The RTFO will also require companies to report on the greenhouse gas savings of their fuels using a carbon calculator (still being developed) and against sustainability criteria which are also in development.

Environmental groups, including The Organic Research Centre, consider the RTFO to be seriously flawed in its current form.

1) ***The Obligation is not linked to greenhouse gas savings***

Biofuel producers will receive a certificate for their biofuels regardless of the greenhouse gas saving and environmental impact. A company can then report a biofuel that has created a net increase in greenhouse gases and caused tropical deforestation, and still receive an RTFO certificate as well as a 20ppl tax duty cut relative to fossil based transport fuels. Effectively we will be subsidising environmental degradation and have absolutely no mechanism in place to ensure the RTFO will deliver true greenhouse gas emissions savings.

Far better for the Obligation to be directly linked to greenhouse gas savings so that a biofuel that produces an GHG saving below a certain threshold - say 20% - does not receive a certificate (or the tax break), a saving of 20-70% receives 1 certificate, and a saving of >80% receives 2 – thereby rewarding best practice.

2) ***The Greenhouse gas (GHG) reporting mechanism fails to account for land-use change***

While companies will be asked to report on the provenance of their biofuels and on land-use of the production site prior to 2005 as part of the sustainability reporting, this

detail is not accounted for in the GHG calculation. Land-use change can cause huge GHG emissions: researchers reckon tropical deforestation is responsible for 10-30% of GHG emissions worldwide, whilst an EU funded study found that the 'payback time' of growing biofuels on previously unploughed grasslands ranged from 17 to 100 years. Thus, biofuel production that has caused huge net increases in GHG emissions will still be able to claim reductions.

Far better that the GHG reporting mechanism accounts for land-use change by effectively refusing to assign any saving to fuels that are associated with deforestation or ploughing of natural and semi-natural grasslands.

**Solid – ligno cellulosic – biofuels**

We should remember that the term biofuel also embraces solid "woody" fuels as well as liquid and gaseous products.

Given that competition for land use will soon re-emerge as a key issue, energy yield per cultivated area is a major concern. In northern European latitudes, the highest yields are obtained with short-rotation coppice (SRC) cultivation of willow (*salix*) or with elephant grass (*miscanthus*), both of which are perennials. They can be grown on land which is considered marginal for conventional agriculture. They are "non-domesticated" plants, and much effort is being devoted to developing "domesticated" strains of these and other crops (notably poplar) to give high energy yields. Woody bio-fuel is already available as forest residues; materials, such as "thinnings", removed during forest management; and even in urban areas from parks and roadside plantings. Some forms of agricultural residue, notably straw, can also be seen as ligno-cellulosic bio-fuels.

Woody bio-fuels have low mass and energy density. Therefore transport distances by road in particular have to be kept short. Ideally, woody bio-fuels are processed or used close to their source. However, if they are chipped or pelleted close to source, they can be shipped by sea without having a disastrous effect on the carbon balance. This lies behind the current international trade in wood chips and pellets, notably from Western Canada into Europe; the sea passage accounts for less emission of carbon dioxide than moving the bio-fuel by road, for example from Bristol to Didcot Power station in the Thames Valley where they are co-fired with coal.

This leads to the conclusion that the preferred use for woody bio-fuels is in local heating or combined heat and power (CHP) plants. This approach has been followed in Austria, where bio-fuels have achieved the greatest penetration (15% of primary energy) in the energy economy. The same approach is being followed in Germany, Denmark and Sweden. Development in the UK has so far been inhibited by the lack of a market for solid bio-fuels; there is now recognition of this problem, and some evidence of concern and effort to remove barriers to the development of a market in the UK.

Where there is a demand for heat – primarily in urban areas – woody biomass is likely to be used for local heating plants once the principle of heat distribution systems is accepted; this is already the pattern elsewhere in Europe.

**A model biofuel future**

Recent studies on the likely future development of biofuels have reached the following conclusions -

1. Once markets have stabilised, bio-fuels markets should be dominated by ligno-cellulosics, used locally. Processing of biomass into liquid fuels is not a realistic, long-term prospect.
2. Bio-ethanol, produced in tropical latitudes and traded internationally, will continue to develop as a gasoline additive. Bio-diesel should decline over time once the perverse incentives which have promoted it as a short-term fix are removed.
3. Transport will be the priority user of fossil hydrocarbons for the foreseeable future.
4. There is a need for small-scale, combined heat and power (CHP) systems fired by ligno-cellulosic biomass.

As we said a year ago, it is folly to pursue biofuels at such environmental cost. Policy makers and government must devote far more effort to diminishing demand – getting cars and other vehicles off the road – and to making us all far more aware of our carbon and energy footprints. We are currently involved in a joint project with Friends of the Earth to analyse "the case for biofuels" and to assess their true impact on sustainability.

**ends**