

Biofuels for transport position statement

Road transport currently accounts for around a quarter of the UK's greenhouse gas emissions and this figure is rising. Biofuels can play a part in reducing emissions but we are not convinced that they are always the best choice for the environment and the economy. However, improved technology, restricting production of biofuels to those grown following best practice and the development of newer advanced (second generation) biofuels all support the case for continuing to carefully develop biofuels for transport.

Key issues

Biofuels offer no guarantee of reducing greenhouse gas (GHG) emissions (GHGs as a percentage of conventional fossil fuels vary between 2 and 106 per cent (see note 1) depending on a number of factors) (see note 2).

Biofuels could potentially have significant effects on the environment at a local, EU and international level. For example, they will need land and water to grow, and the production process could affect water quality, waste management, biodiversity and soil fertility. Cutting down forests (deforestation) could remove any savings in carbon emissions from using biofuels.

Our role

Producers need a range of permits and licences from us to produce biofuels (for example, pollution prevention control, waste, water abstraction etc.). We encourage producers to work with us to make sure they have appropriate permits, licences and planning permissions in place.

We also want them to understand the potential impact their work could have on the environment. We have developed the Biomass Environmental Assessment Tool (BEAT 2), a piece of software to assess the environmental impacts and full energy balance of biomass, including transport biofuels.

Solutions - we call for:

- Government policy should bring about the maximum reduction in greenhouse gas emissions from biofuels in a cost-effective way. Based on its own biomass hierarchy. There is a compelling case to use biomass at the higher end of the biomass hierarchy (see note 3) (for heating) and not the lower end (for transport).

- The Government should assess other ways of reducing greenhouse gas emissions from road transport and compare the environmental and financial costs with those involved in using biofuels for road transport. This should shape any future EU and UK targets for biofuels.
- There needs to be further research into the effects of increasing biofuel blends beyond five per cent of transport fuel, especially for particulate matter and nitrogen oxides.
- The Renewable Transport Fuels Obligation (RTFO) should be designed as a Low Carbon Fuel Obligation with built in incentives favouring lower carbon fuels. Biofuels with high carbon impacts should be ruled out of the RTFO from the start. The fuel supplier needs to prove that the fuel meets a minimum threshold of carbon savings (50 per cent), taking into account how the land was used previously.
- Financial incentives to encourage the use of low carbon energy should limit any potential damage to the environment. For example, the RTFO should include measures to protect the environment, and certificates should only be awarded to fuels that meet environmental standards covering soil, air quality, biodiversity, water use and quality, and waste management. Fuels that do not meet environmental standards should not be eligible for Renewable Transport Fuel certificates. A kitemark could inform consumers of the most environmentally efficient fuels.

Background

Government targets and policy

Since 1990 other sectors have made cuts in greenhouse gas emissions. However, emissions from transport have increased (from 40.9 MtCe in 1990 to 43.8 MtCe in 2004 (see note 4)). Transport has not shared the burden in reducing emissions and meeting climate change targets.

To meet the objectives of the EU Biofuels Directive, carbon savings and energy security, the Government is introducing the RTFO. Under this agreement, transport fuel suppliers have to ensure five per cent (by volume) of total fuel sales are from renewable sources by 2010/11(see note 5). At this level, the Government projects the RTFO will save approximately 0.7 - 0.8 million tonnes of carbon each year (see note 6). The Government plans to introduce carbon and sustainability standards for fuels qualifying for the RTFO by April 2010 and 2011 respectively.

The European Commission has proposed that by 2020 ten per cent (by energy content) of road fuel should come from biofuels. The Commission intends to bring forward an incentive scheme to discourage landowners from converting land with

high biodiversity value to biofuel feedstock cultivation, and using environmentally harmful systems to produce biofuel (see note 7).

Biomass hierarchy (see note 8)

The Government's biomass hierarchy lists the different possible uses for biomass in order of their cost effectiveness (£/tonneC):

- Heating
- Combined heat and power
- Co-fired electricity in large fossil fuel plants
- Dedicated biomass power plant
- Transport fuels

According to the hierarchy, transport biofuels are the least cost-effective way of reducing carbon from biomass.

For example, the estimate for the cost of reducing CO₂ from transport fuels such as biodiesel is £137/tCO₂ and £152/tCO₂ from bioethanol (wheat). On the other hand, using biomass for heat in a large industrial boiler would cost £76/tCO₂, and for a small commercial boiler £78/tCO₂. Sugar beet generally offers higher carbon savings than other feedstocks for biofuels (see note 9). However, newer advanced or second generation (see note 10) biofuels could lead to substantially more carbon savings at lower cost, £30-50/tCO₂ (see note 11), but these are not yet ready for market take-up (see note 12).

UK and EU environment and land use implications

Land is a limited resource and bioenergy crops take up a large amount of land. If half of the crops needed to meet the UK's five per cent renewable transport target (by 2010) were grown in the UK, 740,000 hectares of land would be needed (see note 13). By 2010 up to 800,000 hectares could be available in the UK for bioenergy crops (see note 14). This 'available' land includes all land set-aside and a significant area released from food and fodder production (see note 15). Replacing set-aside land could lead to loss of habitat and damage biodiversity.

Across the EU, 14 million hectares of land would be needed to meet the 5.75 per cent target in 2010 (see note 16), but there is only 13 million hectares of arable land available (see note 17). It is therefore highly unlikely that the EU would aim to meet its target just from EU crops, and imports are likely to play a large role.

The growing demand for biofuel feedstock is likely to increase environmental pressures in countries outside the EU. Increasing demand for palm oil is already leading to large tracts of rainforest being cleared in Malaysia and Indonesia. This has largely been for vegetable oil for western food markets, but is increasingly being used for cheap oil as a renewable fuel (see note 18). Destroying rainforest would cause loss of biodiversity and habitat in the producing country, as well as cancelling out any carbon savings.

Producing biofuels can also affect water use, water quality, waste management, and soil fertility. Some crops increase the risk of reduced recharge to groundwater

aquifers (see note 19), and overusing chemicals pollutes groundwater and rivers (see note 20). Using new land for arable production can release CO₂ (see note 21) and increase the risk of nitrate leaching. Feedstocks for second-generation fuels such as miscanthus, linseed, grass, switchgrass, and willow have fewer effects on the environment than those currently ready to market (see notes 22 and 23).

Notes

1. Sustainable Development Commission, Response to the Department for Transport on Biofuels and the Renewable Transport Fuels Obligation June 2006.
2. Not all biofuels have the same impact on the environment. When assessing the reductions in emissions reductions due to biofuels, it is important to take into account emissions created when producing and distributing the fuel as well as exhaust emissions from driving the vehicle. The emissions generated when producing the fuel will depend on a number of factors, including land use change, feedstocks, inputs (fertilisers and herbicides), energy in production process, use of by-products and transportation methods.
3. See 'Background'.
4. Defra, e-Digest Environmental Statistics, 2006.
5. Announced in November 2005, with consultation on details, as well as issues relating to the future evolution of the RTFO, including appropriate levels of future targets in February 2007.
6. Pre Budget report, HM –Treasury, October 2007.
7. Energy and Transport Directorate General – European Commission, Biofuel issues in the new legislation on the promotion of renewable energy, Public Consultation Exercise, April 2007.
8. Defra, UK Biomass Strategy, May 2007.
9. Concawe, Energy and Greenhouse Gas Balance of Biofuels for Europe – an update, Brussels 2002.
10. Second generation biofuels are newer advanced biofuels from lignocellulosics (non-food crops such wheat straw and wood), and wastes (such as recycled vegetable oil).
11. Defra, UK Biomass Strategy, May 2007.
12. Sustainable Development Commission, Response to the Department for Transport on Biofuels and the Renewable Transport Fuels Obligation June 2006.
13. Using UK yield data from Agriculture in the UK (2006) and 60:40 use of biodiesel:bioethanol. The use of waste and lignocellulosic sources for biofuels reduce the impact on the land compared to other feedstocks. Therefore, land-use intensity would reduce if these sources were taken up.
14. European Environment Agency, How much bioenergy can Europe produce without harming the environment? 8 June 2006
15. Concawe, Energy and Greenhouse Gas Balance of Biofuels for Europe – an update, Brussels 2002. Although there is an assumption that three per cent of the currently intensively cultivated agricultural land is/remains set aside.
16. IFP, Potential biomass mobilization for biofuel production worldwide, in Europe and in France, France 2007.
17. European Environment Agency, How much bioenergy can Europe produce without harming the environment? 8 June 2006.
18. European Commission, Annex to the Commission An EU Strategy for Biofuels, Impact Assessment 2006
19. Defra, UK Biomass Strategy, May 2007.
20. European Commission, Annex to the Commission An EU Strategy for Biofuels, Impact Assessment 2006.
21. Concawe, Energy and Greenhouse Gas Balance of Biofuels for Europe – an update, Brussels 2002.
22. Defra, Planting and Growing Miscanthus, Best Practice Guidelines for Application to Defra's Energy Crops Scheme, July 2007.
23. European Environment Agency, How much bioenergy can Europe produce without harming the environment? 8 June 2006.

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