

making biofuels



sustainable

by Ed Gallagher

As the twentieth century drew to a close, there was considerable support for the use of biofuels as a source of renewable energy. To many people, they offered significant savings in greenhouse gas emissions compared to fossil fuels, an opportunity for reduced dependency on oil for transport, and potential as a counter weight to increasing oil prices. They also promised an opportunity for rural economies to benefit from a new market for their products and a chance of narrowing the gap between rich and poor nations.

Biofuel development was encouraged by government subsidies, and rapid growth occurred in many parts of the world. Forty per cent of Brazilian sugar cane is used for biofuel production, for example, as is almost a quarter of maize grown in the United States.

Although only around 1 per cent of arable land is cultivated to grow feedstock for biofuels, there has been increasing concern over the way a largely unchecked market has developed, and about its social and environmental consequences. Recent research has confirmed that food prices have been driven significantly higher by competition for prime agricultural land and that savings in greenhouse gas emissions are much smaller – and in some cases entirely eliminated – when environmentally important land, such as rainforest, is destroyed to grow biofuels. As a result, many now believe that the economic benefits of biofuels have been obtained at too high a social and environmental price, and they question whether they can be a truly sustainable source of energy.

The United Kingdom has always had sustainability at the heart of its biofuel policies and set up the Renewable Fuels Agency to ensure that this goal was met. The direct effects of biofuel production are already being assessed through five measures of environmental performance and two measures of social performance, as well as measures of the energy efficiency of the production processes used and of the greenhouse gas savings achieved. Previous land use is also recorded.

The indirect effects of biofuel production – such as land displacement – have recently been examined by a review commissioned by the U.K. Government and carried out by the Renewable Fuels Agency. It confirmed the concerns, and

work is now under way to measure the indirect effects and incorporate them in reporting and analysis. It concluded that we need to be more cautious and discriminating in our use of biofuels and called for a slowing of targets until, in particular, the indirect effects could be monitored and evaluated properly. But it also saw a way forward for a sustainable biofuels industry.

If this is to happen, biofuels should use the right feedstocks, be grown on the right land and use the least energy intensive production processes. Thus, ethanol derived from sugar cane, grown on land not needed for food production, farmed with an efficient use of fertilisers and produced using bagasse (sugar cane waste) as a source of energy, would be a sustainable biofuel. However, ethanol derived from maize using highly intensive farming processes, grown on land needed for food, and using energy from coal-fired power stations, would be an unsustainable one.

The Review recommended that biofuel production should be concentrated on idle agricultural land – areas that have been previously farmed but which would remain uncultivated if not used in this way – and on marginal areas which are unproductive when used for food crops or livestock. It also recommended increasing the use of wastes and residues for feedstocks and creating incentives for second generation biofuels using new technologies, such as cellulosic ethanol from woody plants or biodiesel from algae.

The Review also concluded that, left to itself, the market was unlikely to develop in a sustainable way, and so recommended more research into both indirect and direct effects and introducing internationally agreed mandatory sustainability standards. These should be accompanied by full public information to allow consumers to make their views known by purchasing fuels of which they approve.

While the contribution from biofuels may be more constrained and smaller than envisaged in the optimism of some years ago, they cannot be abandoned as part of a low carbon future, particularly for transport. They, along with other measures, will be needed to cope with the developed world's increasing appetite for travel and the millions of new motorists expected in India, China, Russia and elsewhere. 