BIOFUELS IN THE EUROPEAN UNION: STATE OF PLAY

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INTRODUCTION

Everything is connected to everything else. Biofuels are a fine example of the holistic inter-connection of agriculture's impact on the environment and human life. It makes no sense to look at any particular biofuel in isolation from its full life cycle. It has always been a key principle of LUFPIG to examine any issue in terms of the food chain. In the case of biofuels a focus purely on primary producers in the EU is misleading and positively dangerous. LUFPIG and GLOBE need to think of the full chain: primary producers, traders, processors, the food industry, distributors, retailers, consumers, the taxpayer and the impact of all the above on the environment, development and animal welfare.

Transport in the EU is today fuelled almost exclusively from fossil fuels, primarily oil. This situation has implications for energy policy, but it is also of great relevance from an environmental perspective, notably in view of climate change. Several different economic and environmental forces have converged in recent years to generate growing interest in alternate sources of energy, including biofuels, within the European Union. The European Commission is using both legislation and formal directives to promote biofuel production and use within the EU. However, EU biofuel production, which is entirely of first generation biofuels such as bioethanol and biodiesels from food crops such as cereals, sugar and rape, is impeded by its high production costs relative to fossil fuels. Till now, the most important biofuel produced in the EU has been biodiesel with an 80% share of EU biofuel production in 2004, and bioethanol has accounted for the remainder (see the table below).

Processed from biomass, a renewable resource, first generation biofuels are a direct substitute for traditional petrol and diesel and can readily be integrated into fuel supply systems. They could also help prepare the way for other much more advanced transport biofuel alternatives, namely second and third generation biofuels (respectively synthetic fuels derived from biorefining ligno-cellulose and biohydrogen). But of themselves, they can neither do much to resolve the EU's energy security needs nor make much of a contribution to solving climate change.

Although first generation biofuels are still more costly to produce than fossil fuels, even at present world oil prices, their use is increasing in countries around the world, but almost entirely as a result of deliberate policy measures, rather than because of the action of market forces.

EU Biofuel Production by Member State, by Fuel Type

	Biodiesel				Bioethanol				Total		
Country	**2002**	**2003**	**2004**		**2002**	**2003**	**2004**		**2002**	**2003**	**2004**
	Million gallons										
Germany	141	224	324		0	0	7		141	224	330
France	114	112	109		30	27	34		145	139	143
Italy	66	85	100		0	0	0		66	85	100
Spain	0	2	4		59	53	65		59	55	69
Denmark	3	13	22		0	0	0		3	13	22
Czech Republic	22	22	19		2	0	0		23	22	19
Austria	8	10	18		0	0	0		8	10	18
Sweden	0	0	0		17	17	17		17	18	18
Poland	0	0	0		22	20	12		22	20	12
United Kingdom	1	3	3		0	0	0		1	3	3
Slovak Republic	0	0	5		0	0	0		0	0	5
Lithuania	0	0	2		0	0	0		0	0	2
Intervention stocks	0	0	0		0	23	29		0	23	29

Total	**355**	**470**	**604**		**130**	**141**	**164**		**484**	**612**	**768**

Source: EurObservER, No. 67, May-June 2005.

However, these figures need to be seen in the context of the EU's overall fuel needs : they represent barely over 1% of the EU's total fuel needs at the moment, which according to the European Commission, account for in excess of 300 mtoe today, rising to possibly some 350 mtoe over the next 20-30 years unless Member States rigorously enforce EU energy efficiency policies. Moreover, first generation biofuels, grown exclusively on EU arable land, could never account for more than one third even of today's fuel needs, so any further development of first generation biofuels will entail serious ramifications for sustainable development, notably in tropical and sub-tropical developing countries, even without taking into consideration the serious disruption that such an approach would cause to EU food and fodder production, processing, distribution and retailing.

BIOFUELS AND SUSTAINABILITY

How green are biofuels ? The question is hardly ever asked by those who present all biofuels as a suitable target for agricultural subsidy in the struggle against man-made climate change. However a moment's thought indicates that biofuels vary widely in terms of their green impact. It is necessary to look at the full life cycle of each biofuel.

How much fossil fuel or fossil-based fertiliser is used in their production ? What is the impact on the long term sustainability of the soils in which they are grown ? What is their impact on animal life, in particular on bird life on land which might otherwise be left fallow. The most urgent task for politicians is to re-define biofuels in terms of their total impact on the environment . As with biotechnology, biofuels need to be repositioned in the public mind and colour coded. Any system of categorisation should be visually simple and robust. The image of traffic lights - red, amber and green - might well be a starting point. The public will immediately understand that a biofuel derived from palm oil grown on recently cleared rainforest land should be rated as red given the loss of biodiversity and the high level of CO^2 emissions involved in rainforest destruction. The inter-connection of UN Conventions and the WTO rules on ppm need urgent resolution.

As far as the EU is concerned, the "sustainability calculus" consists of a complex matrix including the existing energy mix, the source of the biomass, the size of the processing plant (or biorefinery) producing the biofuel and the chosen distribution infrastructure. It is because of the essential complexity of this matrix that such a wide range of "strategic visions" for biofuels have emerged over recent years. However, at the level of principle, it is clear that first generation biofuels suffer severe disadvantages in terms of their sustainability when compared to 2/3 generation biofuels. The existing energy mix in the EU is dominated in most Member States (France being a notable exception) by fossil fuels and first generation biofuels require high energy inputs in the production process, as a result of which their fossil fuel substitution potential is severely restricted. But even more particularly, because first generation biofuels are derived from starch and vegetable oils which would otherwise be devoted to the food and fodder markets, not only do they suffer a low yield/high cost coefficient, they are also very disruptive of the existing agricultural market in Europe.

According to the European Commission's own figures, first generation biofuels in the EU only yield on average approximately 1 toe per hectare (somewhat more for bioethanol from sugar), at higher than even current costs for the equivalent fossil fuel and at considerable cost to the existing traditional food and fodder markets for that starch and vegetable oil. By contrast, 2/3 generation biofuels can be derived from almost the entire range of biomass sources as they are produced from the conversion of ligno-cellulose rather than starch and oil, as a result of which both the supply constraints and the sustainability index are dramatically superior to those of first generation biofuels. As an indicator of this, bio-refined biofuels can yield between 5 to 5.5 toe per hectare when produced from miscanthus, compared to 1 toe from first generation biofuels, and upwards of 6.5 toe for biohydrogen, but whereas all first generation biofuels have to be supplied from arable land, according to the Commission's estimates, up to a half of the EU's fuel needs could be supplied by 2/3 generation biofuels derived from low quality timber and forestry residues

and other organic wastes. Consequently, 2/3 generation biofuels could supply in time most or all of the EU's transport fuel needs with minimum disruption to the EU's traditional food and fodder industries.

THE EU AND GLOBAL SUSTAINABILITY

Subsidies for first generation biofuels not only have direct implications on land use in the European Union, they impact directly on tropical rainforests, reforestation and climate change. These in turn have security and sustainability implications in tropical zones within failing states such as the DRC. Fuel security can no longer be thought of purely in terms of 'growing at home'. Accelerated climate change and environmental degradation feed directly into destabilising migratory patterns of the kind we are seeing in the arc that stretches from Darfur to the Canary Islands.

But a significant move by the EU towards substituting fossil fuel use in Europe by
2/3 generation biofuels would not only largely or entirely remove the "import imperative" from the biofuels equation, thus extinguishing the pressure on tropical and sub-tropical forests and agriculture in favour of palm oil, maize and soya for biofuels exports to the EU, it could equally have direct positive benefits for the agricultural and rural development within these same developing countries. According to the UNDP, 85% of the energy production in sub-Saharan Africa (excluding South Africa) already comes from biomass, albeit mostly from ultra-low technology, and more often than not extremely unhealthy, old-fashioned stove burners. Were the EU to become much more active in promoting "technology leapfrogging" in these countries, notably by introducing the latest technologies for converting biomass to energy, not only could this contribute enormously to rural development in these countries, it could also go a long way towards meeting the UN's Millennium Development goals. Moreover, it would also help respond to the growing need for climate adaptation as well as mitigation in developing countries.

However, the EU's global responsibilities go well beyond the transfer of the latest energy technologies, however important that is for climate mitigation and adaptation in developing countries. A Cap and Trade system of the kind now being introduced in California or the EU Emissions Trading Scheme has knock-on consequences on other policies and particularly on agriculture and land use, not only in California or the EU themselves, but potentially across the entire globe. Even more work needs to be done in examining the impact of climate change on the Common Agricultural Policy as growing areas shift north, as well as the spin-offs of this for all other countries, whether developed or developing.

This should also be seen in the wider context of the role of biofuels in the total agri-energy mix. As a part of this, we need to change attitudes to how we define crops in the European Union. Solar and wind energy should obviously be seen as potential profitable "crops". Solar energy, particularly in areas in the south threatened by increasing water shortages resulting from climate change, should be seen as a commercial alternative to traditional crops, such as tobacco, especially where large-scale irrigation will become increasingly unviable.

We need to re-examine the idea of farming for energy in the full life cycle context. As a minimum, existing farmers should be encouraged to self-supply their own energy using solar, wind as well as biomass as energy sources. The European Wind Energy Association has projected the possibility of building 300GW of wind electricity capacity from just 1% of EU arable land, with negligeable effect on food and fodder production. Farms can act not only as energy suppliers for their own use or for sale off-farm, but also as a means of demonstrating the feasibility of dispersed, decentralised but still connected energy production that could later be copied by suburban areas. This kind of 'farming energy' has direct energy security implications, not only within the EU, but beyond its borders as well. For instance using land for solar energy could be used in the countries of the North African littoral and Saharan Africa both to produce energy and to generate employment in remote, agriculturally non-productive and desert regions, helping to retain productive employment on such land thus reversing further drift into the cities.

But even in more northern climes, especially in the low-lying coastal areas around the North and Baltic Seas which will be increasingly vulnerable to flooding as the century progresses, agri-energy farming could contribute as much to the adaptation to as to the mitigation of climate change. Forests, woodlands and

energy crops, such as miscanthus, are very much more resistant to flooding than are traditional cereal and horticultural crops, so farm incomes are much more likely to be protected over the medium- to long-term by agri-energy farming in these regions than traditional crop and livestock farming would be and at great savings in terms of insurance costs and disruption to the food and fodder industries as well.

WORKING WITH GAIA : THE POLICY FRAMEWORK

Both LUFPIG and GLOBE need to apply their collective minds to how policies relating to the farmer and consumer can be coherently aligned with climate change and energy security. We now accept that the challenge of obesity should be reflected in the policies of the food industry and the behaviour of food retailers. We need to take this a step further and to think through what long-term policies will make sense for a planet seeking to support nine billion mouths. A more vegetarian diet may not recommend itself immediately to the owners of methane-producing prime beef herds, but it is a rational response to the problems currently facing Europe and the world.

More immediately, we need to examine the legislative, financial and even cultural and mindset obstacles that currently stand in the way of developing an agri-energy policy that works with the planet, rather than threatening to destroy it, and if in the process we could devise a means of spending the CAP's Euros 45 billion in a way that mitigates and adapts to climate change, as opposed to provoking it, we may have succeeded in reforming the CAP in a way that is truly globally responsible.