

GUEST OPINION:

Energy from biomass – competition for food production?

As oil prices rise inexorably, the appeal of biofuels is growing rapidly and investors all over the world are looking to reap rewards from bioethanol, biodiesel and other alternative fuels. Although a global market for biofuels is only just emerging, there is already an international trade in bioethanol made from Brazilian sugarcane and biodiesel from Indonesian palm oil. Recently, Malaysia and Indonesia even announced their intention to form a palm oil cartel – the «biofuel OPEC» of the future?

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What is the true scale of the world's bioenergy potential? Theoretically, the earth can feed all the people alive today, yet even now 800 million people are affected by hunger. They suffer from hunger because they are too poor to buy food, not because too little food is available or insufficient land on which to grow it. Particularly in North and South America, however, vast areas are taken up with the production of feed crops for the livestock industries in industrialized countries. The ban on animal meal in livestock feed within the EU has led to the explosive expansion of soya monocultures in Brazil. As things stand today, the European meat-eater has more purchasing power than a hungry African, and following the same brutal logic, producers produce what they can sell. Now biofuels are arriving on the scene as another competing product, and motorists are equally likely to have more purchasing power than 800 million hungry people. Fears are being expressed in many quarters that biofuels will worsen the problem

of hunger, because more intense competition for land use will raise food prices. The simple principle of market economics – rising demand, rising prices – is, of course, just as applicable to Europe: Unilever recently announced that European consumers must be prepared for rising margarine prices because the rapid growth in biodiesel demand has driven up vegetable oil prices.

As yet, rapid growth in demand for bioenergy has seldom resulted in food price increases. But there has certainly been an expansion in cropping land, predominantly in the Cerrado region of Brazil and the Indonesian virgin forest. That, too, is highly problematic from an ecological perspective, to put it mildly. From this point of view, the only biodiesel crops that give no cause for concern are those produced on set-aside farmland in Europe.

Land-use conflict: Pros and cons

For a large proportion of our sympathetic readership, it will be instantly apparent



Photo: agenda/böckling

that biofuels should be rejected on ethical and ecological grounds. We will just have to do with petroleum then – after all, it has not run out yet. But is the issue really that straightforward? Probably not. For one thing, there are considerable scientific uncertainties about the earth's actual potential for the production of biofuels. Optimistic estimates assume that biomass could supply double the current level of worldwide energy consumption without provoking food conflict or harming biodiversity.

Other studies put this potential close to zero. Of course, one can object that these optimistic estimates fail to take account of all kinds of negative trends. We must be prepared for soil degradation and climate change to reduce future yields on some of today's fertile land. Productive areas are continuously being lost as building land to extend settlements. Expanding organic agriculture creates a demand for more land than would a comparable growth in intensive farming (although energy needs fall at the same time).

Biomass, of course, is not used only for food and for energy, but also as a material – either as wood or for the production of paper or other fibrous materials. Global paper consumption is rising rapidly: it averages 55 kilograms per head per year, reaching 230 kilograms in Germany as against 30 kilograms in China – where it can only be expected to increase at a substantial rate. But where will all that wood be grown? Based on our present knowledge, the only thing to be said with certainty is that bioenergy can, but need not automatically, lead to land-use conflicts

with food production. This can only be ruled out completely if the 800 million people suffering from hunger can be given enough purchasing power to compete with European motorists and meat-eaters. That is unlikely for the time being. Of major importance, therefore, is what political framework conditions are put in place for environmentally and socially sustainable bioenergy production.

Wanted: Energy-efficient solutions

At present, the prevailing forms of biofuel production are far from efficient in their use of land. European oilseed rape diesel, Indonesian palm oil and American maize ethanol have rather poor energy balance scores, far below the performance of Brazilian sugar-cane ethanol in particular. Hence there is growing talk of «second generation» biofuels, although ideas about what this actually means are highly divergent. Usually it is understood as involving chemical processes on a mass industrial scale, which – unlike existing forms of oilseed rape diesel – make use of the whole plant and not just small parts of it. These schemes have been the subject of considerable criticism in recent times, however, because as yet it is barely possible to integrate them into agricultural production processes: They harvest the entire biomass, leave waste products which are of no further agricultural use, and correspondingly depend on high (fossil) energy inputs in the form of artificial fertilizers. Far more compatible with agriculture, as well as more benign in respect of energy and climate balance, appears to be the use of biogas: it is a versatile source of fuel and energy, and the vast majority of nutrients can be returned to the land. Cars which run on natural gas are a tried-and-tested technology, but influential actors from the oil and chemicals sector are not inclined to back biogas, for the obvious reason that it would deprive them of their own role in the fuel market. Yet biogas would have one enormous advantage: it can be produced from many different

In debating the advantages of different fuels, biogas must not be overlooked; it can be produced from many different kinds of biomass.

kinds of biomass, making the production of specialized energy crops superfluous. Those whose prime concern is not only to maintain the mobility status quo – in the shape of 600 million (and rising) petrol- or diesel-fuelled vehicles – but also to extend this to newly industrialising countries will, in all probability, create real land-use conflicts, even taking into account the very best technological advances. The high demand for land will put pressure on food prices, particularly those of products which require more space, predominantly meat. But even biodiesel prices will be driven upward substantially by these competing uses. Consumers may one day face a genuine dilemma over whether to eat meat or drive a car, because their purchasing power is no longer sufficient to do both. When all densely populated urban regions have congested roads and polluted air, if not

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before, this form of mobility will finally reach its limits for other reasons. By then, a renaissance in public forms of transportation is likely, because these are undeniably far more energy-efficient than private cars.

At that point, congestion charging schemes, as already operated in London, Singapore and other cities, will become the order of the day everywhere. If petroleum is to be replaced by biofuels on a large scale and real land-use conflicts with food production are to be avoided there will be an inevitable call for the most energy-efficient use of biomass – i.e. simultaneous production of electricity and heat, in which case the electricity can be used to power urban trains and trams. The probability that bioenergy will expand massively without turmoil will depend on the willingness of political actors to set and enforce binding sustainability criteria for bioenergy. For rural development in the South, it seems to make much more sense to use bioenergy locally, either as a replacement for expensively imported petroleum products, or to give people access to modern energy services for the first time. Producing for export on the global market, on the other hand, is liable to follow the well-known patterns of other cash crops.

