

Biofuels: *the 10% question*

The European Union is divided over the thorny issue of biofuels admission and designation. Should the EU hold to its target of 10 percent biofuels blending by 2020 – or will that actually have a negative impact on the environment? Nor does science have the answers – the conflicting testimonies of scientific researchers are driving Euro MPs crazy.

| by *Gert van Wijland*

Just a few years ago diesel derived from purpose-grown energy crops was touted as the answer to climate and energy problems. But times have changed: in 2008 this remedy is seen by many as more harmful than the sickness itself. Many argue that cuts in CO₂ emissions brought about by biofuels are wiped out by the accelerated clearance of rainforests, while fossil fuel dependency is only marginally reduced and world food production put at risk. Proponents of biofuels see the problems as temporary and have high hopes for the more efficient second generation of biofuels. They believe that environmental damage and climate change can be limited by the implementation of strict sustainability criteria.

Given the major social

implications it should come as no surprise that politicians are divided on the issue. The fact that the scientific community is also deeply divided doesn't facilitate their task. 'It's certainly no clear-cut policy terrain', socialist Euro MP Dorette Corbey comments dryly. Even so, Corbey, who is rapporteur for the quality of biofuels dossier, has come to a standpoint. 'I believe that the proposal for compulsory blending of 10 percent biofuels by 2020 should not be pursued. It would be better if this volume target were replaced by a qualitative goal of a 10 percent reduction in CO₂ emissions. But that must be applicable to the entire process, from field to wheel.'

Strict criteria are needed to achieve this, says Corbey. The European Commission realises that too, as shown by

the biofuels directive it drew up early this year. While it holds onto the volume target, it also subjects the cultivation of energy crops to stringent conditions. In part these conditions seek to safeguard nature conservation areas, tropical forests and biodiversity in general. The directive sets out that 'biofuels shall not be made from raw material obtained from land with recognised high biodiversity value', such as unspoiled forests, nature preserves and highly biodiverse grassland. A key addition is that by which the Commission seeks to prevent greenhouse gases now in the ground being released when that land is worked: 'Biofuels shall not be made from raw material obtained from land with high carbon stock', such as wetlands and 'continuously forested areas'.

Hunger for land |

Researchers and other experts across the world are sceptical whether EU criteria will be able to prevent displacement land use. 'It'll be tricky', avers researcher Bas Eickhout of the Dutch nature and environmental planning agency NMP. As a leading advisory body for the government, NMP recently published a report on the pros and cons of biofuels in Europe. The report concludes that Europe will not be able to meet its 10 percent volume target within EU borders: '10% of the European transport consumption in 2020 amounts to around 35 million tonnes of oil equivalent. When grown in Europe with existing technologies ('first generation'), an area of 20 to 30 million hectares is needed for the production of biofuels.'



Photo: Zhang Chuang/Xinhua Press/Corbis

This amount of land is not likely to become available within Europe.' Eickhout estimates that around half of the required energy crops would have to be imported from outside the EU for as long as first generation biofuels are the only available option. Such imports will always lead to further deforestation and loss of biodiversity.

Ukraine included |

But there are believers too. Ranged on the side of the pro-biofuels lobby are equally authoritative experts who maintain that increased production of biofuels need not automatically lead to deforestation or a reduction in arable land. This view is put forward in a report published earlier this spring by seven leading European research institutes, entitled "Eyes on the

track, mind on the horizon, a European Road Map for Biofuels". Working within the cooperative framework ReFuel, researchers took two years to formulate the most favourable route for achieving the 10 percent biofuels goal. 'In theory, large-scale biomass

production can be realised on a global scale without harm to the environment or food production', asserts ReFuel researcher Martin Junginger of Utrecht University. 'The production of grain and other crops in many parts of the world can still be greatly improved. And if optimal efficiency is

achieved, biofuels can be grown alongside without the need for additional land use.'

He backs up this assertion with figures and a real-life example: 'In recent decades, for example, world grain production has increased by 40 percent, while the land requirement

has actually decreased by six percent. Farmers in the west can harvest 10 to 12 tonnes of maize from a single hectare, while the maximum yield in most African countries is two tonnes, due to lack of irrigation and artificial fertilisers.' Maize production in Malawi has almost tripled over the last two

years (from 1.2 to 3.4 million tonnes) after the government decided in 2005 to subsidise the use of artificial fertilisers. 'That shows that rapid improvements can be achieved using existing technologies.' But of course artificial fertilisers do have to be used with restraint, or

they will partly cancel out the carbon benefits, the researcher cautions.

In other parts of the world, too, there is room for increased efficiency. In Brazil millions of hectares can be freed up by improvements in livestock farming. At present a hectare

'Political prestige and major interests are in play'

of grassland is required on average per cow, although in Sao Paulo they achieve higher yields of 1.4 cows per hectare. If the rest of the country could boost yields to similar levels, it would free up 50 to 70 million hectare of land. This land could be used for biofuel crops. What's more, according to ReFuel, Europe is in a position to realise its ten percent biofuels goal without having to resort to crops grown outside its borders. Countries in Eastern Europe have sufficient land available for cultivating energy crops in a sustainable manner – particularly if the Ukraine is included. But this scenario can only succeed if Europe sets strict sustainability criteria for the biofuels eligible for blending under the 10 percent scheme, warns Junginger. 'The CO₂-avoidance requirement must be set as high as possible. Brussels is currently proposing a 35 percent reduction in greenhouse gas emissions per kilometre driven. Under that criterion, even oilseed rape remains a contender for many years to come.'

And oilseed rape is not the answer long-term, the majority of scientists agree. 'Oilseed

rape occupies too much land and generates too few climate benefits. We have to look to second generation biofuels derived from wood and other crops that don't compete

with food,' concludes ReFuel. 'Otherwise the whole of Europe would need to be planted with crops.'

Missed opportunity |

But the second generation will probably only become widely available around 2015. Thus, the 10 percent goal could be in jeopardy. The first steps need to be taken using first-generation crops, is the general consensus among scientists and non-scientists alike. 'A significant weakness of the current proposals is their emphasis on "second generation" biofuels to deliver carbon benefits at the expense of recognising the potential for GHG savings from all biofuels that deliver high GHG saving, including "first generation" fuels.'

That's the opinion of the Low Carbon Vehicle Partnership (LowCVP), an advisory group based in the United Kingdom. The partnership includes members from industry

widely, depending on the feedstock and the way they are cultivated and processed. For example, the field-to-wheel GHG savings relative to petrol for wheat to ethanol can vary

The conflicting views of scientists are enough to drive Euro-MP Corbey crazy

and politics, alongside environmental and consumer groups, academics and representatives of government. Spokesman Neil Wallis stresses the group is broadly positive on the European proposals for a reduction in CO₂ emissions, saying 'they offer advantages for both the climate and for British business'.

But Wallis adds that most LowCVP members believe that the higher biofuel target of 10 percent should only be implemented once adequate systems have been put in place to ensure fuels are sustainable and have low carbon intensity. 'At present that's not always the case.' LowCVP research indicates that on a lifecycle basis, net greenhouse gas emissions of biofuels vary

from 7 to 77 percent.

Despite warnings from researchers against a policy geared one-sidedly to farming interests, the main drivers behind biofuel policy are oilseed rape, maize and grain. While the focus has shifted more towards second generation biofuels in recent years, the balance has only recently tipped in their favour as countries like the US start to invest heavily in the second generation. That Europe didn't pick up on the second generation earlier and propagate it more strongly is 'a missed opportunity', says Junginger.

Crazy |

But how can policy makers opt for a course of action if scientists



are unable to offer unanimous advice on the way forward? Euro-MP Dorette Corbey says the conflicting views published by scientific institutions are enough to drive her crazy. How can NMP state that 10 percent biofuel blending is well-nigh unachievable without large-scale imports while the self-same target is pronounced to be realisable and useful by the Fuel project in its roadmap? The answer lies in the assumptions made by the different groups. ReFuel, for example, rates the carbon savings of oilseed rape higher than does NMP and also assumes a higher rate of growth in farm production. For ReFuel co-ordinator Marc Londo, the key issue is the way in which (European) farmers will respond to an increased demand for biofuel raw materials—whether they exhibit the same gradual production increase as in recent years, or show additional production growth. Given the quality of its arable land and climate, Eastern Europe is in a position to book considerable progress in closing the gap with Western Europe so that indirect effects such as deforestation could be avoided, Londo argues. 'Science is never quite so absolute as policy makers would like,' he says. 'But when one knows what the crucial factors are, then you're in a position to propose additional policy measures. Policies aimed at bolstering agriculture in Eastern Europe, for example, and combating deforestation in the tropics.' It's precisely on this issue that the Dutch NMP has opted for different assumptions than the ReFuel institutes. 'They (ReFuel) conducted what is known as a "potentials study" into the quantity of crop that could

theoretically be produced. We took as our starting point the policy proposals and how the market is likely to react to them,' is how NMP's Bas Eickhout sums up the differences.

In a liberalised agricultural market, part of farming production will inevitably shift to Asia or other parts of the world, Eickhout asserts. After all, it will always be cheaper to grow crops there than on Europe's costly agricultural soil and any excessively strict sustainability criteria for imports will soon be banned by the World Trade Organisation as obstacles to free trade.

'The most effective way of manufacturing biofuel is the production of ethanol from sugar. That's Brazil's speciality and you just try blocking that at the European border', says Eickhout. That's why NMP believes that Europe will remain dependent on non-EU countries for at least half of its biofuels requirements.

'Large-scale biomass production can be realised without harm to the environment'

Lip-service |

NGO's such as Friends of the Earth (FoE) are quick to point out that this will lead to major negative knock-on effects. Fervent supporters of biofuels just a few short years ago, now they're fighting energy crop production tooth and nail. 'Intended CO₂ reductions from agrofuels are disappointing', FoE states in a February 2008 press release. 'After taking into account indirect greenhouse gas emissions from fertilizers

and changes in land use and transport, today's agrofuels and techniques render few CO₂ savings.' FoE bases its conclusion on 'recent calculations by the European Commission's Joint Research Centre'.

Chris Cragg, a biofuels journalist based in the Far East, sees the devastating effect of the increased demand for biofuels feedstock around him every day. 'Few in Europe understand the complexities of tropical land law, or the definition of types of agricultural land and forest,' he says. What alarms the agriculture experts is the sheer speed and scale of the switch to biofuel crops, says Cragg. 'While paying lip-service to the primacy of food production, both governments and agribusiness have joined what can best be described as a mania for agricultural fuel production without examining the wider implications.'

Cragg sees several factors to be

production would be down 8% on current levels by 2020. Few doubt the potential impact on food prices.'

Supertanker |

All in all NMP researcher Bas Eickhout sees little benefit in the 10 percent target proposed by the Commission. 'It puts too much emphasis on the current ways of working and practically rules out other transition routes to sustainable energy production for transport. Look at the possibility of sustainably produced hydrogen, for example. Many see that as the real way forward.'

Euro MP Corbey agrees. 'The volume specification of 10 percent biofuels blending is more likely to impact negatively on climate, the environment and social structures than it is to do any good. That's why my report on the quality of biofuels calls on the European Council to replace this quantitative stipulation with

reckoned with. 'Firstly, if the EU is anticipating a high level of imports from the Asia-Pacific region, it should be aware that demand for biofuels mandated by current legislation in the region itself is set to rise from around 1.2 million tonnes in 2007 to some 8.8 million tonnes by 2013. Secondly, the Asia-Pacific Associations of Agricultural Research Institutions suggested in late 2007 that if things carried on expanding the way they were, regional food calorie

a qualitative criterion of a 10 percent carbon reduction to be achieved through the use of biofuels.'

Unlike sceptical outsiders, Corbey does see possibilities for amending the EU directive. 'Sure, political prestige and major interests are in play, but I detect a parliamentary majority prepared to back my proposals. Europe is like a supertanker: it's difficult to change course, but the ship will turn if the helmsman wants it to.' ■