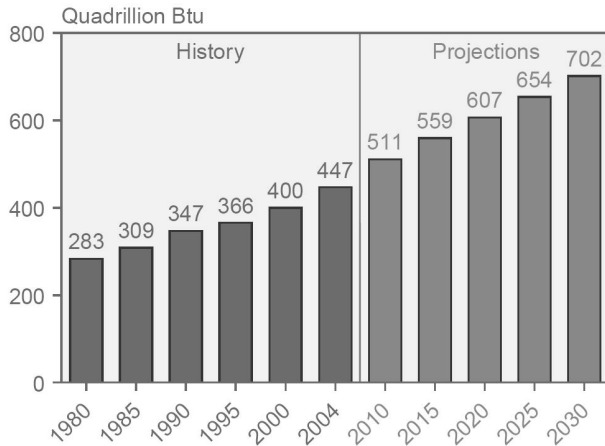


## Biofuels : an unfolding disaster

Dr Andrew Boswell, *biofuelwatch*

Humans are hungry for ever greater power and transport energy, with a predicted global energy increase of 71 per cent by 2030<sup>1</sup>.



(Figure: Global Energy Projections, IEA, 2007)

This demand is driving the planting of massive monocultures of biofuel crops for industrialised countries to use in addition to fossil based energy sources. 2007 is the year that the world has woken up to the environmental and social damage that this is causing worldwide<sup>2, 3</sup>.

### What Are Agrofuels?

Agrofuels are industrial scale biofuels grown in large monocultures. First generation agrofuels include:

- **bioethanol** – alcohol-based fuel derived by fermentation of sugar or starch crops such as sugar cane and beet, corn, wheat, barley and maize. It can be blended with petrol – for example, to produce E5 (5 per cent ethanol) and E85 (85 per cent ethanol)
- **biodiesel** – a fuel made from oilseeds, such as palm, rape and soy, and blended with conventional diesel.

Whereas the United States is largely developing ethanol to blend with petrol, the European market is, so far, based primarily on biodiesel that can be added to diesel.

### Some small scale benefits

There are potentially some benefits from small scale biofuels development. These are in two areas:

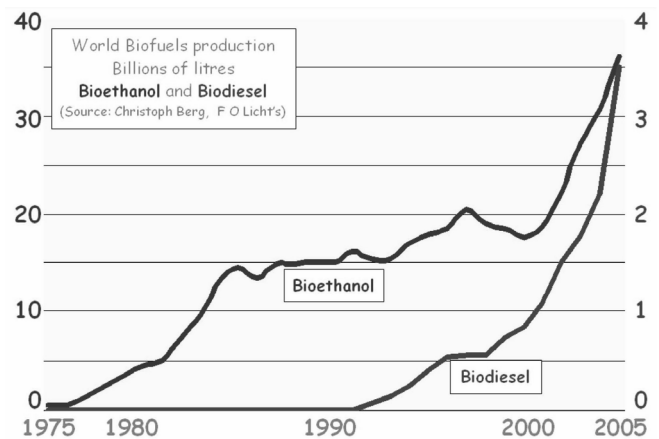
- Recycled cooking oil in industrialised countries. However, this can only make a very limited benefit to climate change emissions.
- Small scale production in developing countries by communities for their community - for heating, lighting and electricity. This can have great social value in freeing women from collecting wood biomass and in protecting women's health from wood burning.

This article is discussing only transport fuels. There could be some role for biomass in energy generation: however, to be sustainable, feedstocks must be grown local to power generation, be organic produced (avoiding emissions from non-organic agriculture) and on a small scale.

### Driving the debate

The current debate about the sustainability of biofuels is centered by concerns about agrofuels. It is an increasingly substantial evidence base that these have negative impacts in three main areas<sup>4, 5, 6, 7, 8</sup>:

- **Climate** : accelerating *global climate change*.
- **Ecosystems**: creating *deforestation, loss of habitats / biodiversity, water depletion, soil erosion, greater use of chemicals*.
- **Social and human** : generating *poverty, land grabbing, land conflicts, human rights abuses, labour abuses, starvation and food insecurity*.



Agrofuels comprise the vast majority of biofuels, and when you 'take the agrofuels out' of biofuels, there is very little left. Agrofuels are expanding fast – see graph – with the EU planning to go from around 1% penetration now to 10% by 2020, and the US from 4% now to 20% by 2020.

The rush to agrofuels and setting targets for them has left any consistent or complete scientific and policy scrutiny of agrofuels behind. We are now already in a downstream 'implementation' phase whilst the facts that should inform the public policy debate – climate, ecosystem and social impacts – are only becoming apparent.

### Accelerating climate chaos

The Stern review on the economics of climate change shows that change in land use (mostly deforestation caused by encroachment of agriculture and plantations) causes 18 per cent of the global total of greenhouse gas emissions causing catastrophic climate change<sup>9</sup>. Such massive land clearances often involve burning the land, so any emission savings made by burning small percentages of biodiesel with diesel in European cars are lost as much greater emissions are made through land-use changes in the global South<sup>10</sup>. The result is that while biofuels may look good in climate change terms from a Western perspective, globally they lead to higher carbon emissions. Effectively, agrofuels provide a mechanism for

industrialised nations to export emissions to the developing South.

Although governments such as that of Malaysia admit that palm plantations have led to the cutting down of large areas of forests, threatening rich biodiversity in their ecosystems<sup>11</sup>, deforestation is often 'officially' hidden when state or commercially owned forest reserves that are not protected are converted to palm oil plantations. In Malaysia, protected forest comprises only 10 per cent of the total, with many ecologically sensitive areas excluded from protection.

A considerable volume of the palm oil sold by Malaysian companies is produced in Indonesia, where the land rights of indigenous and other local communities are routinely ignored, and where human rights violations are common<sup>12</sup>. The pattern is repeated elsewhere as natural forest and savannah in many tropical countries, including Cameroon, Colombia and Ecuador, are being destroyed for palm oil<sup>13, 14, 15, 16, 17</sup>.

The IPCC estimate that stopping deforestation would cut annual emissions by 2Gigatonnes (Gt) of CO<sub>2</sub> (4% of total) and this was highlighted strongly before this year's Bali climate talks<sup>18, 19</sup>.

### Peatland destruction

In South-East Asia, thirst for the so called 'green fuel' is driving another climate chaos timebomb<sup>20</sup>. Millions of hectares of the region's peatland are being drained for oil palm plantations, as most mineral soils areas have now been planted. These peatlands are among the world's most important carbon sinks, storing at least 42 billion tonnes of carbon – the equivalent of about six years' global fossil-fuel emissions. Once the peat is drained, all of the carbon will eventually be released into the atmosphere through slow oxidation, with peat fires greatly speeding up that process<sup>21, 22</sup>.

A recent Greenpeace report shows that a moratorium on peatland conversion and fires in Indonesia would save 1.3 Gt CO<sub>2</sub> (2.6% of total), and reflooding Indonesian peatlands would save 0.5 Gt CO<sub>2</sub> (1% of total)<sup>23</sup>.

### Fertilising catastrophe

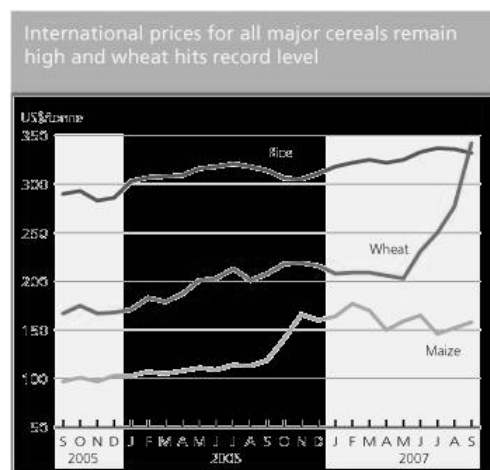
Previous concern about the climate impact of agrofuels was centered on tropical deforestation. However, recent research is calling any climate benefits of agrofuels grown in the northern climates into doubt too. Nobel prize winner Paul Crutzen and others suggest high nitrous oxide emissions from nitrate fertilisers have been under calculated: nitrous oxide is 300 times more powerful than CO<sub>2</sub> as a greenhouse gas. In the case of oilseed rape that comprises 80% of EU home-grown biodiesel, Crutzen writes that biodiesel produced from it can generate up to 70% more greenhouse gas (GHG) emissions than fossil fuel diesel<sup>24</sup>. Similarly, corn ethanol that makes up most of the US biofuels market can produce up to 50% more GHGs than petrol. Most policy makers have not taken on board yet that agrofuels grown in the North or in the South are likely to damage the climate, potentially catastrophically - although Québec may be the first with its announcement of a 180 degrees shift to forbid the development of new ethanol plants<sup>25</sup>.

Further doubt came recently with five senior scientists writing to the head of IPCC, Dr R K Pachauri, to highlight "serious and dangerous deficiencies" in the IPCC AR4 Mitigation book on biofuel emissions balances. The IPCC did not model the effects of land-use change that can cause carbon emissions that negate any emission 'benefits' for decades or centuries<sup>26</sup>.

### Feeding cars or hungry people?

A debate that has become critical in 2007 is the impact of rapid biofuel development on food security<sup>27</sup>. There are two main issues. First, how biofuels are displacing land on which food is grown and this either produces local shortages or removes people's ability to grow their own food. Losing their own food sovereignty, or ability to produce their own food, forces people into having to buy lower quality food from outside their region.

However, more critical at this moment is how the rush to convert food such as maize, wheat, sugar and palm oil into fuel is creating a battle between food and fuel that will leave the poor and hungry in developing countries at the mercy of rapidly rising prices for food, land and water. World prices in food commodities have suffered massive increases during 2007 – see graph from UNA FAO<sup>28</sup>.



Not all of the price rise is due to biofuel production, it is also caused by poor harvests in Australia and more demand for grain for meat in India and China. However, the biofuel contribution to these rises is significant and set to worsen in an unregulated industry<sup>29</sup>. This led to Jean Zeigler, the UN Special Rapporteur for the Right to Food to call for a 5 year moratorium on producing biofuels to combat soaring food prices<sup>30, 31, 32</sup>.

Rising prices force people near to the starvation line into starvation, particular in those countries identified by the UN FAO as high risk – the Low-Income Food-Deficit Countries. The International Food Policy Research Institute (IFPRI) has estimated that the number of people suffering from undernourishment increases by 16 million people for each percentage point increase in the real price of staple food<sup>33</sup>.

A further impact is that the UN FAO is restricted by fixed budgets and it has had to drastically cut its Food Aid program in some of these countries because it can buy less food for the same money. The UN highlighted

in October that surging wheat prices are pushing staple products out of the reach of the poor<sup>34</sup>.

### **Setting aside biodiversity**

The EU Biofuels Directive suggests that by 2020 divert around 18 percent of its cereals harvests, mostly maize and soft wheat, into making biofuel<sup>35</sup>. This year the EU has fast-tracked proposals into law to effectively abolish set aside – releasing up to 2.9m hectares of the 3.8m hectares now under obligatory set-aside for growing more biofuels including oilseed rape<sup>36</sup>. This is after EU biofuel land use has grown from 0.31 million hectares to near 2.0 million hectares between 2004 and 2007<sup>37</sup>. Globally, 100 million hectares of land could be needed to even achieve a 5% biofuels blend<sup>38</sup>.

The abolition of set-aside creates a catastrophic gap for wildlife. Woodlarks, skylarks, tree sparrows and yellowhammers are amongst birds to have benefited in the UK from set-aside because they can find food in winter and undisturbed nesting sites in spring. In East Anglia, 80 per cent of linnets spend the winter on set-aside, compared to one per cent on winter cereals. In France, the little bustard is dependent on set-aside, in Austria; set-aside is important to bird of prey in winter and a variety of farmland birds<sup>39, 40, 41</sup>.

### **Refugees, land and human abuses**

Another key issue raised in 2007 is a growing biofuel refugee problem.

Victoria Tauli-Corpuz chair of UN Permanent Forum on Indigenous Issues said that "Indigenous people are being pushed off their lands to make way for an expansion of biofuel crops around the world, threatening to destroy their cultures by forcing them into big cities". She highlighted that some of the native people most at risk live in Indonesia and Malaysia, which together produce 80 percent of the world's palm oil<sup>42, 43</sup>.

'The speed with which this is happening we don't really realize in our part of the world,' Ida Nicolaisen, an expert in indigenous cultures and member of the U.N. forum, and who has studied violations of indigenous people in Sarawak, Malaysia 'Because the technology we have today and the economic resources that are at stake are so big, it happens overnight.'

See references for more on biodiversity loss, land rights abuses, human rights abuses, workers rights abuses, water and soil degradation, loss of food sovereignty and food security related to biofuel production. See also Oxfam's November 2007 report, "Bio-fuelling Poverty"<sup>44</sup>.

### **Jatropha taking land from the poor**

One crop that is being pushed is Jatropha that proponents claim that it will cause less displacement of food crops as it can grow on 'waste' land. However, there are compelling economic reasons for companies like the UK D1 Oils who want to develop millions of hectares of it. They believe that Jatropha oil can be made significantly lower prices to other oil crops and have estimate Jatropha feedstock oil \$600/tonne compared to June 2007 prices of \$960 for oil seed rape, \$900 for Soya and \$770 for Palm<sup>45</sup>.

In partnership with BP, they aim to plant 1 million hectares of the Jatropha over just the next four years<sup>46</sup>. As of September 2007, they already had 198,000 hectares planted in India, Africa and South East Asia<sup>47</sup>.

However, there are huge issues in countries like India where tribal peoples and landless labourers have historically been denied proper rights to land. In October, some 25,000 of India's poorest marched on Delhi for three weeks, amongst them those displaced by Jatropha growing, to shame the government into keeping its promise to redistribute land<sup>48</sup>.

Oxfam have also warned that better yields will come from land already growing food and that commercial pressures will force Jatropha plantations to compete with food land<sup>49</sup>. There is also an issue as to what is 'marginal' land – such land often provides important ecological services to pastoralists grazing animals and the local community.

### **No viable sustainability criteria**

The emerging awareness of negative impacts from biofuel production has led for calls from governments and industry for sustainability criteria<sup>50</sup>. The industry wants such a mechanism to provide the appearance of 'clean' fuels and to gain the public support needed for the market to develop. Governments want to support industry and to be seen as moral by their electorate.

However, the sustainability criteria being proposed lack credibility and create more questions than they answer. For example, how can the huge EU demand for agrofuels be sourced 'sustainably', when the EU is already an importer of large amounts of unsustainable commodity products for other uses? Previous attempt at certification of much simpler industries have largely failed, for example, the Forest Stewardship Certification that has not prevented precious wood sources from being devastated in the global South.

Current certification schemes do not address displacement. This is where existing agriculture displaced by new biofuel plantations move elsewhere with social or environmental impact. For example, sugar and soya plantation in Brazil that cause agricultural displacement of Amazon rainforest elsewhere. Dr Philip Fearnside of the Brazilian National Institute for Research in the Amazon confirms in the same article: "Soybean farms cause some forest clearing directly...but they have a much greater impact on deforestation by consuming cleared land, savanna, and transitional forests, thereby pushing ranchers and slash-and-burn farmers ever deeper into the forest frontier. Soybean farming also provides a key economic and political impetus for new highways and infrastructure projects, which accelerate deforestation by other actors."<sup>51, 52</sup>

The UK government approach is to adopt 'meta standards' using planned certification processes being developed by others. However, these are immature and still being developed. In the case of the Roundtable for Sustainable Palm Oil, the standard was developed for the palm food oil industry and is largely inappropriate to the biofuels market. These standards are largely developing without the involvement of NGOs representing the people on the ground, and they do not address how conflicts of interest between social

groups in producer countries are dealt with. There is concern that the Governments in exporter countries have the will or necessary mechanisms to police their own producers<sup>53</sup>.

### UK forces consumers to use damaging biofuels

In October 2007, the UK Government introduced the Renewable Transport Fuel Obligation (RTFO) that mandates 2.5% biofuels at the pump from April 2008. This is without any regulatory mechanism to prevent damaging biofuels entering the supply chain. Instead, a 'reporting system' is being established with the aspiration to encourage less damaging biofuels<sup>54</sup>.

However, fuel suppliers are only required to report 50% of their biofuels in 2008-2009. So Palm Oil, creating up to 9 times the greenhouse gas emissions than diesel, may be hidden in the unreported 50%. Further, emissions from destroying peatland need only be reported where biofuels are grown on peatland converted since 2005. Yet, as Greenpeace point out, these peatlands need urgently regeneration to save 0.5 billion tonnes of emissions annually<sup>55</sup>.

As I write, the UNFCCC is about to meet at Bali. Globally we need to make deep emission cuts and simultaneously tackle problems such as deforestation, land use, agriculture and carbon sink degradation that make up 40% of total man-made emissions. We need a total ban on deforestation, and we need land use and agriculture to be decarbonised in the same way as our energy and transport sectors.

A responsible government would be calling for the damaged peatlands in South East Asia to be regenerated to save 0.5 billion tonnes of CO<sub>2</sub>. Instead, the government is allowing biofuels derived from this land to enter the UK fuel supply chain masquerading as benign, 'clean', 'green' fuels.

British motorists should be aware that the RTFO is a 'leaky bucket' for the worst biofuels, and they will have no choice but to be complicit in the huge unfolding humanitarian and ecological disaster created by UK and EU biofuels policy.

The government plan to add mandatory sustainability targets in 2011 though debate in parliament indicates that this is only an 'aspiration'. These leaves a 4 year gap in which the industry can thrive by importing damaging biofuels. UK Government arrogance on the moral issues was indicated by minister, Jim Fitzpatrick's comment in the very week that Jean Ziegler raised the impact of food security at the UN. When asked about the prospect that biofuels could lead to starvation, Mr Fitzpatrick said 'I have demonstrated that that is not the case.'<sup>56</sup>

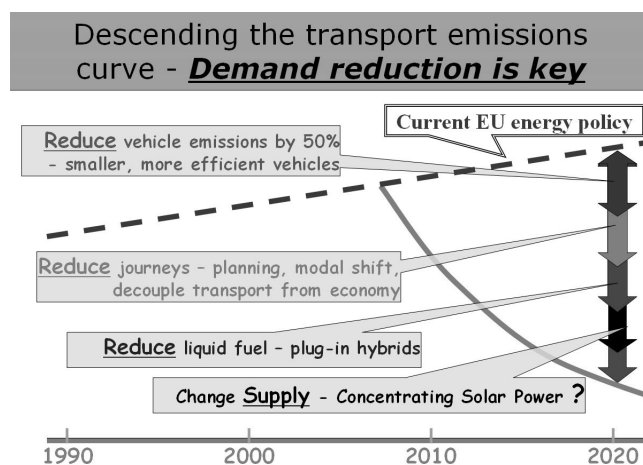
### Social and ecological justice go hand in hand

It is essential that voices for social and environmental justice combine<sup>57</sup> to protect global ecosystems, including old growth forests, peatlands and natural grasslands, as well as biodiverse non-monoculture sustainable agricultural systems. An equitable and evidence-based means of protecting these ecosystems and carbon sinks is needed that does not involve the commoditisation of nature<sup>58</sup>. Facing up to stopping massive agrofuel expansion is part of this challenge.

### Reducing Demand

Unless governments take rapid action to set policies to address these issues, we risk many centuries of climatic instability<sup>59</sup>. The agrofuel craze is currently increasing climate damage, adding to unsustainable pressures for land, water and resources, and impacting the ability of the weakest people on the planet to survive.

Yet, there is a simple solution. We need to abandon the notion of sustaining energy growth at projected rates. Instead, we need to cut consumption and reduce carbon emissions by 90 per cent by 2030<sup>60, 61</sup> in industrialised countries. This is both technically and socially feasible, and can be achieved both by sensible policy decisions and people themselves at the grassroots.



Road transport is responsible for 26% of UK carbon dioxide emissions, has risen by 10% since 1990 and is set to rise by another 10% by 2020. To make the 90% descent of the transport emissions curve, we must REDUCE vehicle emissions by 50%, REDUCE journeys and speeds, REDUCE liquid fuels in transport economy, and REDUCE the use of carbon in power generation<sup>62</sup> as electric vehicles become mainstream.

### World wide concerns / southern NGOs

Over the year, there has been rising concern over the massive biofuel expansion dictated by EU and US policy. There have been several calls for a moratorium<sup>63</sup>. Biofuelwatch is part of a coalition of NGOs<sup>64, 65</sup> who have called for an immediate moratorium on EU incentives for agrofuels, EU imports of agrofuels and EU agroenergy monocultures. 189 organisation and 191 individuals have signed so far<sup>66</sup>.

### The author

Dr Andrew Boswell is a UK Green Party councillor in Norfolk, UK and a core member of biofuelwatch, a volunteer-led group campaigning for a full public policy debate on biofuels. biofuelwatch are calling for a moratorium on EU biofuels targets and imports (<http://tinyurl.com/23wu7s>) to prevent accelerating climate change, starvation, deforestation, biodiversity loss, human rights abuses, water and soil degradation. For more information about Biofuelwatch, is at [www.biofuelwatch.org.uk](http://www.biofuelwatch.org.uk).

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